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# PROJECT MANUAL

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**Poughkeepsie City School  
District**



## 2020 CAPITAL IMPROVEMENT PROJECT PHASE 1B – BUILDING IMPROVEMENTS

### Early Learning Center

372 Church Street, Poughkeepsie, NY 12601

SED Project No: 13-15-00-01-0-008-022

### Columbus School

18 South Perry Street, Poughkeepsie, NY 12601

SED Project No: 13-15-00-01-0-001-014

### Morse Elementary School

101 Mansion Street, Poughkeepsie, NY 12601

SED Project No: 13-15-00-01-0-002-014

### Poughkeepsie Middle School

55 College Avenue, Poughkeepsie, NY 12601

SED Project No: 13-15-00-01-0-015-021

### Clinton Elementary School

100 Montgomery Street, Poughkeepsie, NY 12601

SED Project No: 13-15-00-01-0-004-014

### Krieger Elementary School

265 Hooker Avenue, Poughkeepsie, NY 12603

SED Project No: 13-15-00-01-0-006-014

### Warring Elementary School

283 Mansion Street, Poughkeepsie, NY 12601

SED Project No: 13-15-00-01-0-005-013

### Poughkeepsie High School

70 Forbus Street, Poughkeepsie, NY 12603

SED Project No: 13-15-00-01-0-007-018

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**CPL PROJECT NO.: 14078.09**  
**DOCUMENT DATE: OCTOBER 20, 2021**

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### **DESIGN PROFESSIONAL'S CERTIFICATION**

*The undersigned certifies that, to the best of his or her knowledge, information and belief, the design conforms to all applicable provisions of the Building Code of New York State, the New York State Energy Conservation Construction Code, and the Manual of Planning Standards of the New York State Education Department.*

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#### **ARCHITECT/ENGINEER**

**CPL**  
50 FRONT STREET  
NEWBURGH, NY 12550  
(800) 274-9000 - PH

#### **OWNER**

**POUGHKEEPSIE CITY SCHOOL DISTRICT**  
18 SOUTH PERRY STREET  
POUGHKEEPSIE, NY 12601  
(845) 451-4995 - PH

#### **CONSTRUCTION MANAGER**

**TRITON CONSTRUCTION**  
1279 ROUTE 300 1<sup>ST</sup> FLOOR  
NEWBURGH, NY 12550  
(845) 522-8869 - PH









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- B. PHS AA002 SECOND FLOOR OVERALL PLAN
- C. PHS AA101 TOILET ROOM ASBESTOS ABATEMENT PLANS
- D. PHS AA102 TOILET ROOM ASBESTOS ABATEMENT PLANS
- E. PHS AA103 LOCKER ROOM ASBESTOS ABATEMENT PLANS
- F. PHS AA104 ROOF ASBESTOS ABATEMENT PLAN
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**2.03 ARCHITECTURAL**

- A. PHS A001 FIRST FLOOR OVERALL PLAN
- B. PHS A002 SECOND FLOOR OVERALL PLAN
- C. PHS A101 TOILET ROOM DEMOLITION PLANS
- D. PHS A102 TOILET ROOM DEMOLITION PLANS
- E. PHS A103 LOCKER ROOM DEMOLITION PLANS
- F. PHS A201 TOILET ROOM NEW WORK PLANS
- G. PHS A202 TOILET ROOM NEW WORK PLANS
- H. PHS A203 LOCKER ROOM NEW WORK PLANS & DETAILS
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- B. PHS E101 HS FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- C. PHS E102 HS SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- D. PHS E200 HS FIRST FLOOR TOILET ROOM NEW WORK PLANS
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- F. PHS E202 HS SECOND FLOOR TOILET ROOM NEW WORK PLANS

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- B. PHS P102 SECOND FLOOR PLAN PLUMBING DEMOLITION
- C. PHS P103 FIRST FLOOR PLAN PLUMBING DEMOLITION
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- E. PHS P202 SECOND FLOOR PLUMBING NEW WORK
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- J. PHS P602 SECOND FLOOR ENLARGED TOILET PLANS PLUMBING WATER NEW WORK
- K. PHS P603 FIRST FLOOR ENLARGED TOILET PLAN PLUMBING - WATER NEW WORK

## **POUGHKEEPSIE MIDDLE SCHOOL**

### **3.01 SITE LOGISTICS**

- A. PMS SL-1 SITE LOGISTICS PLAN

### **3.02 ASBESTOS ABATEMENT**

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  - B. PMS AA002 FIRST FLOOR OVERALL PLAN
  - C. PMS AA003 SECOND FLOOR OVERALL PLAN
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I. PMS AA105 ROOF ASBESTOS ABATEMENT PLAN

**3.03 ARCHITECTURAL**

- A. PMS A001 LOWER LEVEL OVERALL PLAN
- B. PMS A002 FIRST FLOOR OVERALL PLAN
- C. PMS A003 SECOND FLOOR OVERALL PLAN
- D. PMS A004 THIRD FLOOR OVERALL PLAN
- E. PMS A101 TOILET ROOM DEMOLITION PLANS
- F. PMS A102 TOILET ROOM DEMOLITION PLANS
- G. PMS A103 TOILET ROOM DEMOLITION PLANS
- H. PMS A201 TOILET ROOM NEW WORK PLANS
- I. PMS A202 TOILET ROOM NEW WORK PLANS
- J. PMS A203 TOILET ROOM NEW WORK PLANS
- K. PMS A204 ROOF PLAN NEW WORK & NOTES
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  - D. PMS E102 MS FIRST FLOOR TOILET ROOM DEMOLITION PLANS
  - E. PMS E103 MS SECOND FLOOR TOILET ROOM DEMOLITION PLANS
  - F. PMS E104 MS THIRD FLOOR TOILET ROOM DEMOLITION PLANS
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- G. PMS E200 MS BOILER ROOM NEW WORK PLANS
- H. PMS E201 MS LOWER LEVEL TOILET ROOM NEW WORK PLANS
- I. PMS E202 MS FIRST FLOOR TOILET ROOM NEW WORK PLANS
- J. PMS E203 MS SECOND FLOOR TOILET ROOM NEW WORK PLANS
- K. PMS E204 MS THIRD FLOOR TOILET ROOM NEW WORK PLANS

### **3.06 PLUMBING**

- A. PMS P101 LOWER LEVEL PLAN PLUMBING DEMOLITION
- B. PMS P102 FIRST FLOOR PLAN PLUMBING DEMOLITION
- C. PMS P103 SECOND FLOOR PLAN PLUMBING DEMOLITION
- D. PMS P104 THIRD FLOOR PLAN PLUMBING DEMOLITION
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- G. PMS P203 SECOND FLOOR ENLARGED PLAN PLUMBING WASTE - NEW WORK
- H. PMS P204 THIRD FLOOR ENLARGED PLAN PLUMBING WASTE - NEW WORK
- I. PMS P501 BASEMENT ENLARGED TOILET PLANS PLUMBING WASTE NEW WORK
- J. PMS P502 FIRST FLOOR ENLARGED TOILET PLANS PLUMBING WASTE NEW WORK
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- M. PMS P601 LOWER LEVEL ENLARGED TOILET PLANS PLUMBING WATER NEW WORK
- N. PMS P602 FIRST FLOOR ENLARGED TOILET PLANS PLUMBING WATER NEW WORK
- O. PMS P603 SECOND FLOOR ENLARGED TOILET PLANS PLUMBING WATER NEW WORK
- P. PMS P604 THIRD FLOOR ENLARGED TOILET PLANS PLUMBING WATER NEW WORK

### **CLINTON ELEMENTARY SCHOOL**

#### **4.01 SITE LOGISTICS**

- A. CES SL-1 SITE LOGISTICS PLAN

#### **4.02 ASBESTOS ABATEMENT**

- A. CES AA001 LOWER LEVEL OVERALL PLAN
- B. CES AA002 FIRST FLOOR OVERALL PLAN
- C. CES AA003 SECOND FLOOR OVERALL PLAN
- D. CES AA101 TOILET ROOM ASBESTOS ABATEMENT PLANS
- E. CES AA102 BOILER ROOM ASBESTOS ABATEMENT PLAN

#### **4.03 ARCHITECTURAL**

- A. CES A001 LOWER LEVEL OVERALL PLAN
  - B. CES A002 FIRST FLOOR OVERALL PLAN
  - C. CES A003 SECOND FLOOR OVERALL PLAN
  - D. CES A101 TOILET ROOM DEMOLITION PLANS
  - E. CES A201 TOILET ROOM NEW WORK PLANS
  - F. CES A202 ROOF PLAN NEW WORK
  - G. CES A601 TOILET ROOM REFLECTED CEILING PLANS
  - H. CES A901 DOOR SCHEDULE AND DETAILS
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#### **4.04 HVAC**

- A. CES H100A LOWER LEVEL TOILET ROOM DEMOLITION PLANS
- B. CES H100B BOILER ROOM DEMOLITION PLANS
- C. CES H101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- D. CES H102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. CES H103 ROOF DEMOLITION PLANS
- F. CES H200A LOWER LEVEL TOILET ROOM NEW WORK PLANS
- G. CES H200B BOILER ROOM NEW WORK PLANS
- H. CES H201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- I. CES H202 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- J. CES H203 ROOF NEW WORK PLANS

#### **4.05 ELECTRICAL**

- A. CES E100 BOILER ROOM DEMOLITION PLAN
- B. CES E101 LOWER LEVEL TOILET ROOM DEMOLITION PLANS
- C. CES E102 FIRST FLOOR LEVEL TOILET ROOM DEMOLITION PLANS
- D. CES E103 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. CES E200 BOILER ROOM NEW WORK PLAN
- F. CES E201 LOWER LEVEL TOILET ROOM NEW WORK PLANS
- G. CES E202 FIRST FLOOR LEVEL TOILET ROOM NEW WORK PLANS
- H. CES E203 SECOND FLOOR TOILET ROOM NEW WORK PLANS

#### **4.06 PLUMBING**

- A. CES P101 LOWER LEVEL PLAN PLUMBING DEMOLITION
- B. CES P102 FIRST FLOOR PLAN PLUMBING DEMOLITION
- C. CES P103 SECOND FLOOR PLAN PLUMBING DEMOLITION
- D. CES P201 LOWER LEVEL PLAN PLUMBING NEW WORK
- E. CES P202 FIRST FLOOR PLAN PLUMBING NEW WORK
- F. CES P203 SECOND FLOOR PLAN PLUMBING NEW WORK
- G. CES P501 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- H. CES P502 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- I. CES P601 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK
- J. CES P602 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK

### **KRIEGER ELEMENTARY SCHOOL**

#### **5.01 SITE LOGISTICS**

- A. KES SL-1 SITE LOGISTICS PLAN

#### **5.02 ASBESTOS ABATEMENT**

- A. KES AA001 FIRST FLOOR OVERALL PLAN
  - B. KES AA002 SECOND FLOOR OVERALL PLAN
  - C. KES AA101 TOILET ROOM ASBESTOS ABATEMENT PLANS
  - D. KES AA102 BOILER ROOM ASBESTOS ABATEMENT PLAN
  - E. KES AA103 ASBESTOS ABATEMENT ROOF PLAN
-



### **5.03 ARCHITECTURAL**

- A. KES A001 FIRST FLOOR OVERALL PLAN
- B. KES A002 SECOND FLOOR OVERALL PLAN
- C. KES A101 TOILET ROOM & STAIR DEMOLITION PLANS
- D. KES A201 TOILET ROOM & STAIR NEW WORK PLANS
- E. KES A202 ROOF PLAN NEW WORK PLAN & NOTES
- F. KES A601 TOILET ROOM REFLECTED CEILING PLANS
- G. KES A801 ROOF DETAILS
- H. KES A802 ROOF DETAILS
- I. KES A803 STAIR DETAILS
- J. KES A804 ROOF DETAILS
- K. KES A901 DOOR SCHEDULE & DETAILS

### **5.04 HVAC**

- A. KES H101A FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- B. KES H101B BOILER ROOM DEMOLITION PLANS
- C. KES H102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- D. KES H103 ROOF DEMOLITION PLANS
- E. KES H201A FIRST FLOOR TOILET ROOM NEW WORK PLANS
- F. KES H201B BOILER ROOM NEW WORK PLANS
- G. KES H202 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- H. KES H203 ROOF NEW WORK PLANS

### **5.05 ELECTRICAL**

- A. KES E001 PARTIAL SITE AND FIRST FLOOR PLANS
- B. KES E100 BOILER ROOM DEMOLITION PLAN
- C. KES E101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- D. KES E102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. KES E200 BOILER ROOM NEW WORK PLAN
- F. KES E201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- G. KES E202 SECOND FLOOR TOILET ROOM NEW WORK PLANS

### **5.06 PLUMBING**

- A. KES P101 FIRST FLOOR PLAN PLUMBING DEMOLITION
- B. KES P102 SECOND FLOOR PLAN PLUMBING DEMOLITION
- C. KES P201 FIRST FLOOR PLAN PLUMBING NEW WORK
- D. KES P202 SECOND FLOOR PLAN PLUMBING NEW WORK
- E. KES P501 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- F. KES P601 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK

## **MORSE ELEMENTARY SCHOOL**

### **6.01 SITE LOGISTICS**

- A. MES SL-1 SITE LOGISTICS PLAN



## **6.02 ASBESTOS ABATEMENT**

- A. MES AA001 LOWER LEVEL OVERALL PLAN
- B. MES AA002 FIRST FLOOR OVERALL PLAN
- C. MES AA003 SECOND FLOOR OVERALL PLAN
- D. MES AA101 ALL FLOORS ASBESTOS ABATEMENT PLANS
- E. MES AA102 BOILER ROOM ASBESTOS ABATEMENT PLAN

## **6.03 ARCHITECTURAL**

- A. MES A001 LOWER LEVEL OVERALL PLAN
- B. MES A002 FIRST FLOOR OVERALL PLAN
- C. MES A003 SECOND FLOOR OVERALL PLAN
- D. MES A101 TOILET ROOM DEMOLITION PLANS
- E. MES A201 TOILET ROOM NEW WORK PLANS
- F. MES A202 ROOF PLAN NEW WORK
- G. MES A601 TOILET ROOM REFLECTED CEILING PLANS
- H. MES A901 DOOR SCHEDULE & DETAILS

## **6.04 HVAC**

- A. MES H100 BOILER ROOM DEMOLITION PLANS
- B. MES H101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- C. MES H102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- D. MES H103 THIRD FLOOR TOILET ROOM DEMOLITION PLANS
- E. MES H104 ROOF DEMOLITION PLANS
- F. MES H200 BOILER ROOM NEW WORK
- G. MES H201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- H. MES H202 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- I. MES H203 THIRD FLOOR TOILET ROOM NEW WORK PLANS
- J. MES H204 ROOF NEW WORK PLAN

## **6.05 ELECTRICAL**

- A. MES E100 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- B. MES E101 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- C. MES E102 THIRD FLOOR TOILET ROOM DEMOLITION PLANS
- D. MES E200 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- E. MES E201 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- F. MES E202 THIRD FLOOR TOILET ROOM NEW WORK PLANS

## **6.06 PLUMBING**

- A. MES P101 FIRST FLOOR PLAN PLUMBING DEMOLITION
  - B. MES P102 SECOND FLOOR PLAN PLUMBING DEMOLITION
  - C. MES P103 THIRD FLOOR PLAN PLUMBING DEMOLITION
  - D. MES P201 FIRST FLOOR PLAN PLUMBING NEW WORK
  - E. MES P202 SECOND FLOOR PLAN PLUMBING NEW WORK
  - F. MES P203 THIRD FLOOR PLAN PLUMBING NEW WORK
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- G. MES P501 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- H. MES P502 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- I. MES P601 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK
- J. MES P602 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK

## **WARRING ELEMENTARY SCHOOL**

### **7.01 SITE LOGISTICS**

- A. WES SL-1 SITE LOGISTICS PLAN

### **7.02 ASBESTOS ABATEMENT**

- A. WES AA001 LOWER LEVEL OVERALL PLAN AND WINDOW ASBESTOS ABATEMENT
- B. WES AA002 FIRST FLOOR OVERALL PLAN AND WINDOW ASBESTOS ABATEMENT
- C. WES AA003 SECOND FLOOR OVERALL PLAN AND WINDOW ASBESTOS ABATEMENT
- D. WES AA101 TOILET ROOMS ASBESTOS ABATEMENT PLANS
- E. WES AA102 BOILER ROOM ASBESTOS ABATEMENT PLAN
- F. WES AA103 ROOF ASBESTOS ABATEMENT PLAN

### **7.03 ARCHITECTURAL**

- A. WES A001 LOWER LEVEL OVERALL PLAN
- B. WES A002 FIRST FLOOR OVERALL PLAN
- C. WES A003 SECOND FLOOR OVERALL PLAN
- D. WES A101 TOILET ROOM & EXTERIOR DOORS DEMOLITION PLANS
- E. MES A201 TOILET ROOM & EXTERIOR DOORS NEW WORK PLANS
- F. MES A202 ROOF PLAN NEW WORK & NOTES
- G. WES A203 ROOF PLAN NEW WORK & NOTES
- H. MES A601 TOILET ROOM REFLECTED CEILING PLANS
- I. WES A801 ROOF DETAILS
- J. WES A802 ROOF DETAILS - RESTORATION
- K. WES A803 ROOF DETAILS - REPLACEMENT
- L. WES A901 WINDOW SCHEDULE
- M. WES A902 DOOR SCHEDULE & DETAILS

### **7.04 HVAC**

- A. WES H100A LOWER LEVEL TOILET ROOM DEMOLITION PLANS
- B. WES H100B BOILER DEMOLITION PLANS
- C. WES H101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- D. WES H102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. WES H103 ROOF DEMOLITION PLANS
- F. WES H200A LOWER LEVEL TOILET ROOM NEW WORK PLANS
- G. WES H200B BOILER ROOM NEW WORK PLANS
- H. WES H201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- I. WES H202 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- J. WES H203 ROOF NEW WORK PLANS



## **7.05 ELECTRICAL**

- A. WES E001 PARTIAL SITE AND FIRST FLOOR PLANS
- B. WES E100 BOILER ROOM DEMOLITION PLAN
- C. WES E101 LOWER LEVEL & FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- D. WES E102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. WES E200 BOILER ROOM NEW WORK PLAN
- F. WES E201 LOWER LEVEL & FIRST FLOOR TOILET ROOM NEW WORK PLANS
- G. WES E202 SECOND FLOOR TOILET ROOM NEW WORK PLANS

## **7.06 PLUMBING**

- A. WES P101 BASEMENT PLAN PLUMBING DEMOLITION
- B. WES P102 FIRST FLOOR PLAN PLUMBING DEMOLITION
- C. WES P103 SECOND FLOOR PLAN PLUMBING DEMOLITION
- D. WES P201 BASEMENT PLAN PLUMBING NEW WORK
- E. WES P202 FIRST FLOOR PLAN PLUMBING NEW WORK
- F. WES P203 SECOND FLOOR PLAN PLUMBING NEW WORK
- G. WES P501 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- H. WES P601 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK

## **SMITH EARLY LEARNING CENTER**

### **8.01 SITE LOGISTICS**

- A. ELC SL-1 SITE LOGISTICS PLAN

### **8.02 ASBESTOS ABATEMENT**

- A. ELC AA001 LOWER LEVEL OVERALL PLAN
- B. ELC AA002 FIRST FLOOR OVERALL PLAN
- C. ELC AA003 SECOND FLOOR OVERALL PLAN
- D. ELC AA101 TOILET ROOM ASBESTOS ABATEMENT PLANS
- E. ELC AA102 BOILER ROOM ASBESTOS ABATEMENT PLAN

### **8.03 ARCHITECTURAL**

- A. ELC A001 LOWER LEVEL OVERALL PLAN
- B. ELC A002 FIRST FLOOR OVERALL PLAN
- C. ELC A003 SECOND FLOOR OVERALL PLAN
- D. ELC A101 TOILET ROOM DEMOLITION PLANS
- E. ELC A201 TOILET ROOM NEW WORK PLANS
- F. ELC A202 ROOF PLAN NEW WORK
- G. ELC A501 TOILET ROOM INTERIOR ELEVATIONS
- H. ELC A601 TOILET ROOM REFLECTED CEILING PLANS
- I. ELC A901 DOOR SCHEDULE & DETAILS

### **8.04 HVAC**

- A. ELC H100A LOWER LEVEL TOILET ROOM DEMOLITION PLANS
  - B. ELC H100B BOILER ROOM DEMOLITION PLANS
  - C. ELC H101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
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- D. ELC H102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. ELC H200A LOWER LEVEL TOILET ROOM NEW WORK PLANS
- F. ELC H200B BOILER ROOM NEW WORK PLANS
- G. ELC H201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- H. ELC H202 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- I. ELC H203 ROOF PLAN NEW WORK

#### **8.05 ELECTRICAL**

- A. ELC E100 BOILER ROOM DEMOLITION PLAN
- B. ELC E101 LOWER LEVEL TOILET ROOM DEMOLITION PLANS
- C. ELC E102 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- D. ELC E103 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- E. ELC E200 BOILER ROOM NEW WORK PLAN
- F. ELC E201 LOWER LEVEL TOILET ROOM NEW WORK PLANS
- G. ELC E202 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- H. ELC E203 SECOND FLOOR TOILET ROOM NEW WORK PLANS

#### **8.06 PLUMBING**

- A. ELC P101 BASEMENT PLAN PLUMBING DEMOLITION
- B. ELC P102 FIRST FLOOR PLAN PLUMBING DEMOLITION
- C. ELC P103 SECOND FLOOR PLAN PLUMBING DEMOLITION
- D. ELC P201 BASEMENT FLOOR PLAN PLUMBING NEW WORK
- E. ELC P202 FIRST FLOOR PLAN PLUMBING NEW WORK
- F. ELC P203 SECOND FLOOR PLAN PLUMBING NEW WORK
- G. ELC P501 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- H. ELC P601 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK
- I. ELC P602 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK

### **COLUMBUS ELEMENTARY SCHOOL**

#### **9.01 SITE LOGISTICS**

- A. CCS SL-1 SITE LOGISTICS PLAN

#### **9.02 ASBESTOS ABATEMENT**

- A. CCS AA001 LOWER LEVEL OVERALL PLAN
- B. CCS AA002 FIRST FLOOR OVERALL PLAN
- C. CCS AA003 SECOND FLOOR OVERALL PLAN
- D. CCS AA101 TOILET ROOM ASBESTOS ABATEMENT PLANS

#### **9.03 ARCHITECTURAL**

- A. CCS A001 LOWER LEVEL OVERALL PLAN
  - B. CCS A002 FIRST FLOOR OVERALL PLAN
  - C. CCS A003 SECOND FLOOR OVERALL PLAN
  - D. CCS A101 TOILET ROOM DEMOLITION PLANS
  - E. CCS A201 TOILET ROOM NEW WORK PLANS
  - F. CCS A202 ROOF PLAN NEW WORK
-



- G. CCS A601 TOILET ROOM REFLECTED CEILING PLANS
- H. CCS A901 DOOR SCHEDULE & DETAILS

#### **9.04 HVAC**

- A. CCS H100 LOWER LEVEL TOILET ROOM DEMOLITION PLANS
- B. CCS H101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- C. CCS H102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- D. CCS H103 ROOF DEMOLITION PLANS
- E. CCS H200 LOWER LEVEL TOILET ROOM NEW WORK PLANS
- F. CCS H201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- G. CCS H202 SECOND FLOOR TOILET ROOM NEW WORK PLANS
- H. CCS H203 ROOF NEW WORK PLANS

#### **9.05 ELECTRICAL**

- A. CCS E100 LOWER LEVEL TOILET ROOM DEMOLITION PLANS
- B. CCS E101 FIRST FLOOR TOILET ROOM DEMOLITION PLANS
- C. CCS E102 SECOND FLOOR TOILET ROOM DEMOLITION PLANS
- D. CCS E200 LOWER LEVEL TOILET ROOM NEW WORK PLANS
- E. CCS E201 FIRST FLOOR TOILET ROOM NEW WORK PLANS
- F. CCS E202 SECOND FLOOR TOILET ROOM NEW WORK PLANS

#### **9.06 PLUMBING**

- A. CCS P101 BASEMENT PLAN PLUMBING DEMOLITION
- B. CCS P102 FIRST FLOOR PLAN PLUMBING DEMOLITION
- C. CCS P103 SECOND FLOOR PLAN PLUMBING DEMOLITION
- D. CCS P201 BASEMENT PLAN PLUMBING NEW WORK
- E. CCS P202 FIRST FLOOR PLAN PLUMBING NEW WORK
- F. CCS P203 SECOND FLOOR PLAN PLUMBING NEW WORK
- G. CCS P501 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- H. CCS P502 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WASTE NEW WORK
- I. CCS P601 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK
- J. CCS P602 ALL FLOORS ENLARGED TOILET PLANS PLUMBING - WATER NEW WORK

#### **GENERAL**

##### **10.01 ASBESTOS ABATEMENT**

- A. AA 000 ASBESTOS ABATEMENT NOTES

##### **10.02 ARCHITECTURAL**

- A. GEN A401 PARTITION TYPES & LINTEL SCHEDULE
- B. GEN A501 TYPICAL FIXTURE MOUNTING HEIGHT DETAILS & ELEVATIONS

##### **10.03 HVAC**

- A. GEN H000 HVAC SYMBOLS LIST
  - B. GEN H500 MECHANICAL CONTROLS AND SCHEMATICS
  - C. GEN H501 MECHANICAL CONTROLS AND SCHEMATICS
  - D. GEN H600 BOILER SCHEMATICS
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- E. GEN H601 BOILER SCHEMATICS
- F. GEN H602 BOILER SCHEMATICS
- G. GEN H800 HVAC DETAILS
- H. GEN H801 HVAC DETAILS
- I. GEN H802 HVAC DETAILS
- J. GEN H803 HVAC DETAILS
- K. GEN H804 HVAC DETAILS
- L. GEN H805 HVAC DETAILS
- M. GEN H900 HVAC SCHEDULES AND DETAILS
- N. GEN H901 HVAC SCHEDULES

**10.04 ELECTRICAL**

- A. GEN E000 ELECTRICAL LEGENDS & NOTES
- B. GEN E900 ELECTRICAL DETAILS & SCHEDULES
- C. GEN E901 ELECTRICAL SCHEDULES

**10.05 PLUMBING**

- A. GEN P001 PLUMBING EQUIPMENT & FIXTURE SCHEDULE

**10.06 STRUCTURAL**

- A. GEN S801 DESIGN CRITERIA AND NOTES

**END OF SECTION**



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**SECTION 00 1116  
INVITATION TO BID**

**THE POUGHKEEPSIE CITY SCHOOL DISTRICT INVITES BIDS FOR "POUGHKEEPSIE CSD -  
PHASE 1B BUILDING IMPROVEMENTS" PROJECT.**

**1.01 PROJECT INFORMATION**

- A. Project Identification: Poughkeepsie CSD - Phase 1B Building Improvements
  - 1. Project Location(s):
    - a. Poughkeepsie High School, 70 Forbus Street, Poughkeepsie, New York 12601.
    - b. Poughkeepsie Middle School, 55 College Avenue, Poughkeepsie, NY 12601.
    - c. Warring Elementary School, 283 Mansion Street, Poughkeepsie, NY 12601.
    - d. Early Learning Center, 372 Church Street, Poughkeepsie, NY 12601.
    - e. Clinton Elementary School, 100 Montgomery Street, Poughkeepsie, NY 12601.
    - f. Columbus Elementary School, 18 South Perry Street, Poughkeepsie, NY 12601
- B. Owner: Poughkeepsie City School District, 18 S. Perry Street, Poughkeepsie, NY 12601.
  - 1. Owner's Representative:
    - a. Marcos Rodriguez
    - b. PH: 845-867-6103
- C. Architect/Engineer: CPL, at 50 Front Street, Newburgh, NY 12550.
- D. Construction Manager: Triton Construction - 1279 State Route 300, 1st Floor, Newburgh, NY 12550
  - 1. Construction Manager's Representative:
    - a. Kevin Sawyer
    - b. PH: 845-821-3354
- E. Project Description: Project consists of building improvements (including, but not limited to, boiler replacement, roofing replacement and restoration, and toilet room and locker room renovations) as described in the Contract Documents.
- F. Construction Contract(s): Bids will be received for the following Work:
  - 1. Multiple Contract Project consisting of the following prime contracts:
    - a. Contract 1: Boiler Replacement (Cooperative Purchase Agreement).
    - b. Contract 2: Roofing Work (Cooperative Purchase Agreement).
    - c. Contract 3: Poughkeepsie High School - General Construction - Part 1.
    - d. Contract 4: Poughkeepsie High School - Mechanical Construction - Part 1.
    - e. Contract 5: Poughkeepsie High School - Electrical Construction - Part 1.
    - f. Contract 6: Poughkeepsie High School - Plumbing Construction - Part 1.
    - g. Contract 7: Early Learning Center - General Construction
    - h. Contract 8: Early Learning Center - Mechanical Construction
    - i. Contract 9: Early Learning Center - Electrical Construction
    - j. Contract 10: Early Learning Center - Plumbing Construction
    - k. Contract 11: Columbus School - General Construction - Part 1
    - l. Contract 12: Columbus School - Mechanical Construction - Part 1
    - m. Contract 13: Columbus School - Electrical Construction - Part 1
    - n. Contract 14: Columbus School - Plumbing Construction - Part 1
    - o. Contract 15: Clinton ES - General Construction
    - p. Contract 16: Clinton ES - Mechanical Construction
    - q. Contract 17: Clinton ES - Electrical Construction
    - r. Contract 18: Clinton ES - Plumbing Construction
    - s. Contract 19: Poughkeepsie Middle School - General Construction - Part 1
    - t. Contract 20: Poughkeepsie Middle School - Mechanical Construction - Part 1
    - u. Contract 21: Poughkeepsie Middle School - Electrical Construction - Part 1



- v. Contract 22: Poughkeepsie Middle School - Plumbing Construction - Part 1
- w. Contract 23: Warring ES - General Construction
- x. Contract 24: Warring ES - Mechanical Construction
- y. Contract 25: Warring ES - Electrical Construction
- z. Contract 26: Warring ES - Plumbing Construction

#### **1.02 BID SUBMITTAL AND OPENING**

- A. Owner will receive sealed lump sum bids until the bid time(s) and date(s) at the location given below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
  - 1. Bid Date(s):
    - a. Contracts 3 thru 18, inclusive: 04-19-2022
    - b. Contracts 19 thru 26, inclusive: 04-21-2022
  - 2. Bid Time: 3:00 p.m. local time.
  - 3. Location: Poughkeepsie City School District, 18 S. Perry Street, Poughkeepsie, New York 12601
- B. Bids will be thereafter publicly opened.

#### **1.03 BID SECURITY**

- A. Bid security shall be submitted with each bid in an amount not less than five percent (5%) of the base bid in the form and subject to the conditions provided in the "Instructions to Bidders".

#### **1.04 PREBID MEETING**

- A. Pre-bid Meeting: A Pre-Bid meeting/walk-thru for the Project will be held 9:00 AM local time on April 12, 2022 starting at the Poughkeepsie High School. Prospective bidders are requested to attend. Prospective bidders may visit the site(s) April 4, 2022 thru April 8, 2022, after 3:00 PM, by appointment by contacting Kevin Sawyer at 845-821-3354.

#### **1.05 DOCUMENTS**

- A. Complete digital sets of Bidding Documents may be obtained online as a download at [www.cplplanroom.com](http://www.cplplanroom.com) under 'public projects' for a non-refundable reproduction fee of \$49.00.
- B. Complete hard copy sets of Bidding Documents may be obtained from Rev, 330 Route 17A, Suite #2, Goshen, New York 10924 Tel: 1-877-272-0216, upon depositing the sum of \$100 for each combined set of documents. Checks or money orders shall be made payable to Poughkeepsie City School District. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.
- C. All bid addenda will be transmitted to registered plan holders via email and will be available at [www.cplplanroom.com](http://www.cplplanroom.com). Plan holders who have paid for hard copies of the bid documents will need to make the determination if hard copies of the addenda are required for their use, and coordinate directly with the printer for hard copies of addenda to be issued. There will be no charge for registered plan holders to obtain hard copies of the bid addenda.
- D. A Bidder, upon 1) making the deposit required for the Bid Documents, 2) submitting a Proposal accompanied by the required bid security, and 3) returning the plans and specifications used by such Bidder in good condition within thirty (30) days following the award of the Contract, or rejection of the Bid, shall have returned to them the full amount of the deposit for one copy of the plans and specifications.

#### **1.06 TIME OF COMPLETION**

- A. Successful bidder shall begin the Work upon receipt of the Notice to Proceed and shall complete the Work within the Contract Time.



**1.07 BIDDER'S QUALIFICATIONS**

- A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. A Performance Bond, separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.

**1.08 NOTIFICATION**

- A. Attention of the Bidder is particularly called to the Owner's sales tax exemption, the requirements as to conditions of employment to be observed, and the minimum wage rates to be paid under the Contract. In addition, the Bidding Documents contain detailed requirements for the qualification of Bidders. These include, among other things, rigid bonding and insurance requirements, financial statements, bank references, lists of lawsuits, arbitrations or other proceedings in which the Bidder has been named as a party, a statement of surety's intent to issue Performance and Payment Bonds, and a description of other projects of similar size and scope completed by the Bidder.
- B. Bids shall be prepared as set forth in "Instructions to Bidders", enclosed in a sealed envelope bearing on its face the name and address of the Bidder and the title of the Work to which the bid enclosed relates.
- C. No bids may be withdrawn for a period of forty-five (45) days after opening of bids.

**1.09 AWARD OF BIDS**

- A. The Poughkeepsie City School District hereby reserves the right to waive any informalities and reject any, or all, Bids or to accept the one that, in its judgement, will be in the best interest of Poughkeepsie City School District.
- B. The Owner further reserves its right to disqualify Bidders for any material failure to comply with the "Instructions to Bidders".

**END OF SECTION**



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**SECTION 00 2000  
INSTRUCTIONS TO BIDDERS COVER****PART 1 GENERAL****1.01 SUMMARY**

- A. Attached is AIA Document A701-2018, Instructions to Bidders.
  - 1. AIA Document A701-2018 defines the conditions affecting award of contract and procedures with which Bidders must comply.
- B. Note that the bidding documents include reference to toilet room renovations at Morse Elementary School and Krieger Elementary School - **this work is not being bid at this time.**
- C. Note that the bidding documents include reference to window and exterior door replacement at Warring Elementary School - **this work is not being bid at this time.**
- D. Note that the bidding documents include reference to boiler replacement work. The Owner will be procuring boiler replacement work via Cooperative Purchase Agreement.
- E. Note that the bidding documents include reference to roofing replacement and restoration work. The Owner will be procuring roofing replacement and restoration work via Cooperative Purchase Agreement.

**PART 2 PRODUCTS (NOT USED)****PART 3 EXECUTION (NOT USED)****END OF SECTION**



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# AIA® Document A701™ – 2018

## Instructions to Bidders

for the following Project:  
(Name, location, and detailed description)

2020 Capital Improvement Project  
Phase 1B: Building Improvements

Early Learning Center  
372 Church Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-008-022

Clinton Elementary School  
100 Montgomery Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-004-014

Columbus School  
18 South Perry Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-001-014

Krieger Elementary School  
265 Hooker Avenue  
Poughkeepsie, NY 12603  
SED # 13-15-00-01-0-006-014

Morse Elementary School  
101 Mansion Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-002-014

Warring Elementary School  
283 Mansion Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-005-013

Poughkeepsie Middle School  
55 College Avenue  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-015-021

Poughkeepsie High School  
70 Forbus Street  
Poughkeepsie, NY 12603  
SED # 13-15-00-01-0-007-018

**THE OWNER:**  
(Name, legal status, address, and other information)

Poughkeepsie City School District

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.



18 South Perry Street  
Poughkeepsie, NY 12603

**THE ARCHITECT:**

*(Name, legal status, address, and other information)*

CPL  
50 Front Street, Suite 202  
Newburgh, New York 12550

**TABLE OF ARTICLES**

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## ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)*

*(Paragraph deleted)*



§ 3.1.2. Bidders may obtain one complete set of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within thirty (30) days following the award of the Contract or rejection of the Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded. Good condition as used in this section means that the Bidding Documents must be returned bound as issued, legible, and containing only the markings necessary for bidding purposes.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

### § 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven calendar days prior to the date for receipt of Bids. The day the bids are due shall not be counted as one of the seven days referred to.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)*

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

### § 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

#### § 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on the Substitution Request Form is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.



§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

#### § 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)*

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids. The day the bids are due shall be counted as one of the four days referred to.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

#### § 3.5 EQUIVALENCY

§ 3.5.1 In the Specifications, if two or more kinds, types, brands, or manufacturers or materials are named, they shall be regarded as the required standard of quality, and are presumed to be equal. The Contractor may select one of these items or, if the Contractor desires to use any kind, type, brand, manufacturer or material other than those named in the Specification, he shall indicate in writing to the Architect and Owner, and prior to the award of Contract, what kind, type, brand or manufacturer is included in the Base Bid for the specified item.

### ARTICLE 4 BIDDING PROCEDURES

#### § 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.1.9 Each bid must include a fully executed copy of the Insurance Certification Form (See Section 00 4980). Failure to include with the bid may result in the Owner finding the Contractor "non-responsive" to the bid documents.



## **§ 4.2 BID SECURITY**

**§ 4.2.1** Each Bid shall be accompanied by a Bid Security in the form and amount required. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

**§ 4.2.1.1** Bids shall be accompanied by a Bid Security of not less than five percent (5%) of the amount of the Bid. Such Bid Security shall be submitted in the form of a Bid Bond or a Certified Check made payable to the Owner. The submission shall be made with the understanding that the Bid Security shall guarantee that the Bidder will not withdraw its Bid for a period of forty-five (45) days after the scheduled closing time for the receipt of Bids, and that if its Bid is accepted, the Bidder will enter into a formal contract with the Owner in accordance with the terms stated in the Bid and will furnish any required performance and payment bonds at the time required. In the event of the withdrawal of said Bid within the forty-five (45) day period or the failure of the successful Bidder to enter into the Contract with the Owner or the failure of the successful Bidder to furnish required performance and payment bonds at the time required, the Bid Security shall be forfeited to the Owner as liquidated damages, not as a penalty, which represents the damage the Owner incurred as a result of the Bidder's default.

**§ 4.2.1.2** The Bid Securities shall be returned to all Bidders except the three (3) lowest Bidders within three (3) days after the formal opening of bids. The remaining Bid Securities will be returned within forty-eight (48) hours after the Owner and the successful Bidder have executed the Contract and executed performance and payment bonds have been approved by the Owner. If a Contract has not been executed or performance and payment bonds have not been approved by the Owner within forty-five (45) days after the scheduled closing time for the receipt of bids, then Bid Securities will be returned within three (3) days after the expiration of this forty-five (45) day period unless the Bid Security has been forfeited under § 4.2.1.1.

**§ 4.2.2** If the Bid Security is provided in the form of a Bid Bond (rather than a certified check), it shall be written on AIA Document A310, Bid Bond, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

*(Paragraphs deleted)*

## **§ 4.3 SUBMISSION OF BIDS**

### **§ 4.3.1**

*(Paragraphs deleted)*

All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

**§ 4.3.2** Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

**§ 4.3.3** The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

**§ 4.3.4** Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

*(Paragraph deleted)*

### **§ 4.4 Modification or Withdrawal of Bid**

**§ 4.4.1** Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.



§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

*(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)*

## **ARTICLE 5 CONSIDERATION OF BIDS**

§ 5.1 **OPENING OF BIDS** At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

### **§ 5.2 REJECTION OF BIDS**

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

### **§ 5.3 ACCEPTANCE OF BID (AWARD)**

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

.1 The Owner may also reject any Bid not prepared and submitted in accordance with all provisions of the Bidding Documents.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **ARTICLE 6 POST-BID INFORMATION**

### **§ 6.1 Contractor's Qualification Statement**

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

*(Paragraphs deleted)*

### **§ 6.3 Submittals**

§ 6.3.1 **CONTRACTOR'S QUALIFICATION INFORMATION** – The apparent low bidder must submit the required pre-award submittal package described below to the Construction Manager within 48 hours after the bids are opened.

Triton Construction Company  
1279 Route 300  
1<sup>st</sup> Floor  
Newburgh, NY 12550

Submissions must be emailed and must include the Project Name of this contract in the Subject Line of the Pre-Award submission email.

#### **(1) Pre-award Submittal Package**

- (i) Fully executed AIA A305 Contractors Qualification Statement (to be submitted with the bid).
- (ii) Most recent financial statement certified by CPA.
- (iii) References and Experience:



1. List of all past contracts with K-12 Public School Districts (Provide Architect & CM Contact Information)
  2. Provide three (3) references (Name, Title, and Phone Number) associated with three (3) different projects (public or private sector) of similar scope and size to the one identified in this contract. Additionally, include the names of two major suppliers used for each of these three (3) projects.
- (2) Workforce and Work Plan – Provide a detailed written Work Plan which shall demonstrate the contractor's understanding of overall project scope and shall include, but not be limited to, the following
- (i) Sequential listing of specific project activities required to successfully complete the Work of the contract.
    1. Include Critical Milestones
    2. Narrative of project work plan, sequencing, etc.
    3. Include phasing of the Work, if required.
    4. Include listing of long lead items.
    5. Statement that the project can be completed in established time.
  - (ii) Resumes for Contractor's proposed supervisory staff, including qualifications for specialized expertise or any certification(s) required to perform the Work.
  - (iii) Names of proposed sub-contractors and a listing of the related trade of work and value.
  - (iv) Any special coordination requirements with other trades.
  - (v) Any special storage and staging requirements for construction materials.
- (3) Detailed Cost Estimate:
- (i) A copy of a Detailed Cost Estimate outlined in CSI format.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

## ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

### § 7.1 BOND REQUIREMENTS

§ 7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract (performance bond) and payment of all obligations arising thereunder (payment bond). Bonds may be secured through the Bidder's usual sources unless otherwise required in writing. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Bid and Contract Sum. The amount of each bond shall be equal to one hundred (100) percent of the Contract Sum.

§ 7.1.2 The cost of furnishing performance and payment bonds shall be included in the Bid and Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost shall be adjusted and included in the Bid and Contract Sum.

*(Paragraphs deleted)*

### § 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than ten (10) days after the Bidder has received notice of the acceptance of its Bid but in no event shall bonds be delivered later than the date of the executed Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the



Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise required in writing, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. The amount of each bond shall be equal to one hundred (100) percent of the Contract Sum.

- .1 The Performance and Payment Bonds shall have as surety thereunder such surety company or companies as are acceptable to Treasury Department of the United States on Bonds given to the United States Government, and are authorized to do business in the State of New York. Premium on such Bonds shall be included in the Bid.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

## **ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS**

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 All Specification Sections and Drawings Listed in Section 00 01 10 Table of Contents.

## **ARTICLE 9: TAXES**

*(Paragraphs deleted)*

9.1 The Owner is an organization, which is exempt from New York State and Local Sales and Use Taxes. Materials purchased for use in fulfilling this Contract will be exempt from New York Sales Tax. The Owner will provide the Contractor with a completed Form ST-121.1, Exempt Organization Certification. The Contractor shall present a copy of this Form and a completed Form ST-120.1, Contractor Exempt Purchase Certificate, to each supplier. Should sales tax be assessed, the Owner agrees that the Contract Sum shall be increased by the full amount of such assessment.







REQUESTS FOR  
CLARIFICATION OF BID  
DOCUMENTS**SECTION 00 3000**  
**REQUESTS FOR CLARIFICATION OF BID DOCUMENTS****PART 1 GENERAL****1.01 SUMMARY**

- A. Requests for clarifications of the Bid Documents shall be submitted by Bidders to the Architect/Engineer via email (send to k-sawyer@tritonconstruction.net. Requests shall include the following information:
1. Project Name: Poughkeepsie City School District, Poughkeepsie CSD - Phase 1B Building Improvements.
  2. Bidder's name and full contact information.
  3. Subject Specification Number.
  4. Subject Drawing Number.
  5. Clarification request/question.
- B. All valid request for clarifications will be answered via written addendum.

**PART 2 PRODUCTS (NOT USED)****PART 3 EXECUTION (NOT USED)****END OF SECTION**



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**SECTION 00 3114  
CONSTRUCTION SCHEDULE COVER**

**PART 1 GENERAL**

**1.01 CONSTRUCTION SCHEDULE**

- A. Attached is the Construction Schedule for the project.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



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**SECTION 00 4001**

**BOILER REPLACEMENT WORK (COOPERATIVE PURCHASE CONTRACT)**

**THE OWNER WILL BE PROCURING BOILER REPLACEMENT WORK VIA COOPERATIVE PURCHASE CONTRACT.**

**END OF SECTION**



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POUGHKEEPSIE CSD

Phase 1B Building Improvements

14078.09

ROOFING WORK (Cooperative  
Purchase Contract)

00 4002 1

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**SECTION 00 4002**

**ROOFING WORK (COOPERATIVE PURCHASE CONTRACT)**

**THE OWNER WILL BE PROCURING ROOFING WORK VIA COOPERATIVE PURCHASE  
CONTRACT.**

**END OF SECTION**



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FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- GENERAL CONSTRUCTION -  
PART 1

14078.09

00 4003 1

**SECTION 00 4003**  
**FORM OF PROPOSAL – POUGHKEEPSIE HIGH SCHOOL - GENERAL CONSTRUCTION - PART 1**  
**PART 1 GENERAL**

## 1.01 SUMMARY

- A. Fill in information:

Date:	
TO:	
OWNER NAME & ADDRESS:	
FROM:	
BIDDER NAME & ADDRESS	

## 1.02 GENERAL

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,  
we, \_\_\_\_\_
1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE HIGH SCHOOL - GENERAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:
- |              |         |
|--------------|---------|
|              | DOLLARS |
| ( \$ _____ ) |         |
| BASE BID     |         |
- Work of the Base Bid is the provision of all general construction work, including associated hazardous material abatement, required for the renovation of rooms T-1, T-2, T-11, T-12, T-25, T-26, T-17, T-18, T-21, T-22, and associated Janitor's Closets.

### 1.03 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- GENERAL CONSTRUCTION -  
PART 1

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 01 2100)**

- A. Specified Allowance as indicated in Specification Section 01 2100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 01 2700)**

- A. In addition to the Work provided within the above Base Bid, the Undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from the Base Bid quantities.

1. Unit Price No. GC-1: Abate mudded joint packing (elbows) and/or pipe insulation.

\$ \_\_\_\_\_ per lineal foot.

2. Unit Price No. GC-2: Remove existing roof curb, modify roof system, install new curb (curb supplied by others), and flash-in new curb (curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square).

\$ \_\_\_\_\_ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. GC-1: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms 122, 123, 124, 119, 120, 142A, 144A, 146, T-19, T-20, T-20A.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

2. Alternate No. GC-2A: Provide all general construction work, including associated hazardous material abatement, required to renovate the Girls' Locker Room, and the Boys' Locker Room, excluding work relative to installation of RTU's (i.e., provision of additional roof beams in Girls' Locker Room). This Bid Alternate GC-2A will only be accepted if Bid Alternate GC-2B is selected by the Owner.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

3. Alternate No. GC-2B: Provide all general construction work, including associated hazardous material abatement, required relative to the installation of RTU's at the Girls' Locker Room (i.e., ceiling demolition, provision of additional roof beams, ceiling replacement), and the Boys' Locker Room.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- GENERAL CONSTRUCTION -  
PART 1

4. Alternate No. GC-3: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms T-15, T-16, 126B, 126C, T-23, T-24, T-13, T-14, 126A, and associated Janitor's Closets.

ADD/DEDUCT	( \$	)
		DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
1. Profit and overhead as permitted in the General Conditions.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- GENERAL CONSTRUCTION -  
PART 1

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**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.
-



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- GENERAL CONSTRUCTION -  
PART 1

Addendum #	Dated:	
Addendum #	Dated:	
Addendum #	Dated:	
Addendum #	Dated:	

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
- That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- GENERAL CONSTRUCTION -  
PART 1

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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
------------------------------------

Date:
-------

**END OF SECTION**



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- MECHANICAL CONSTRUCTION  
- PART 1

**SECTION 00 4004**  
**FORM OF PROPOSAL – POUGHKEEPSIE HIGH SCHOOL - MECHANICAL CONSTRUCTION - PART**  
**1**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to POUGHKEEPSIE HIGH SCHOOL - MECHANICAL CONSTRUCTION WORK - PART 1 as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
BASE BID	
Work of the Base Bid is the provision of all mechanical work required for the renovations of rooms T-1, T-2, T-11, T-12, T-25, T-26, T-17, T-18, T-21, T-22, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- MECHANICAL CONSTRUCTION  
- PART 1

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. In addition to the Work provided within the above Base Bid, the Undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from Base Bid quantities.

1. Unit Price No. MC-1: Supply mechanical equipment roof curbs for roof openings 10 inches by 10 inches square to 20 inches x 20 inches square.

\$ \_\_\_\_\_ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. MC-1: Provide all mechanical construction work required relative to the renovation of rooms 122, 123, 124, 119, 120, 142A, 144A, 146, T-19, T-20, T-20A.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

2. Alternate No. MC-2A: Provide all mechanical construction work required relative to the renovation of the Girls' Locker Room and the Boys' Locker Room, excluding work relative to providing RTU'S. This Bid Alternate MC-2A will only be accepted if Bid Alternate MC-2B is accepted by the Owner.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

3. Alternate No. MC-2B: Provide RTU's, and all associated mechanical work, at Girls' Locker Room and Boy's Locker Room.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

4. Alternate No. MC-3: Provide all mechanical construction work required relative to the renovation of rooms T-15, T-16, 126B, 126C, T-23, T-24, T-13, T-14, 126A, and associated Janitor's Closets.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

5. Alternate No. MC-4: Provide HVAC equipment required to provide air-conditioning to the Girl's and Boys' Locker Rooms (acceptance of this Bid Alternate MC-4 by the Owner is subject to the Owner's acceptance of Bid Alternate MC-2A).



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- MECHANICAL CONSTRUCTION  
- PART 1

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ADD/DEDUCT ( \$	)
	DOLLARS

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**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
1. Profit and overhead as permitted in the General Conditions.
-



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- MECHANICAL CONSTRUCTION  
- PART 1

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**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.
-



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- MECHANICAL CONSTRUCTION  
- PART 1

Addendum #	Dated:	
Addendum #	Dated:	
Addendum #	Dated:	
Addendum #	Dated:	

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
- That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- MECHANICAL CONSTRUCTION  
- PART 1

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Notary Public Signature and Stamp:

**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- ELECTRICAL CONSTRUCTION  
- PART 1

**SECTION 00 4005**

**FORM OF PROPOSAL – POUGHKEEPSIE HIGH SCHOOL - ELECTRICAL CONSTRUCTION - PART**

**1**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE HIGH SCHOOL - ELECTRICAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
BASE BID	
Work of the Base Bid is the provision of all electrical construction work required relative to the renovation of rooms T-1, T-2, T-11, T-12, T-25, T-26, T-17, T-18, T-21, T-22, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- ELECTRICAL CONSTRUCTION  
- PART 1

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

**1.06 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. EC-1: Provide all electrical construction work required relative to the renovation of rooms 122, 123, 124, 119, 120, 142A, 144A, 146, T-19, T-20, T-20A.

ADD/DEDUCT ( \$

)

DOLLARS

2. Alternate No. EC-2A: Provide all electrical construction work required relative to the renovation of the Girls' Locker Room and the Boys' Locker Room, excluding work relative to the installation of the corresponding RTU's. This Bid Alternate EC-2A will only be accepted if Bid Alternate EC-2B is accepted by the Owner.

ADD/DEDUCT ( \$

)

DOLLARS

3. Alternate No. EC-2B: Provide all electrical construction work required relative to the installation of the RTU's at the Girls' Locker Room and the Boys' Locker Room.

ADD/DEDUCT ( \$

)

DOLLARS

4. Alternate No. EC-3: Provide all electrical construction work required relative to the renovation of rooms T-15, T-16, 126B, 126C, T-23, T-24, T-13, T-14, 126A, and associated Janitor's Closets.

ADD/DEDUCT ( \$

)

DOLLARS

5. Alternate No. EC-4: Provide electrical construction work required relative to providing air-conditioning to the Girls' and Boys' Locker Rooms (acceptance of this Bid Alternate EC-4 by the Owner is subject to the Owner's acceptance of Bid Alternate EC-2A).

ADD/DEDUCT ( \$

)

DOLLARS

**1.07 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- ELECTRICAL CONSTRUCTION  
- PART 1

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**1.08 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.09 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.10 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
1. Profit and overhead as permitted in the General Conditions.

**1.11 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder
-



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- ELECTRICAL CONSTRUCTION  
- PART 1

3. prior to opening, directly or indirectly, to any other bidder or to any competitor; and  
No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.12 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.13 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.14 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.15 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.16 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.17 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.18 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- ELECTRICAL CONSTRUCTION  
- PART 1

**1.19 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.20 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the “Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012” list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

**1.21 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- ELECTRICAL CONSTRUCTION  
- PART 1

00 4005 6

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Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

**END OF SECTION**



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- PLUMBING CONSTRUCTION -  
PART 1

**SECTION 00 4006**

**FORM OF PROPOSAL – POUGHKEEPSIE HIGH SCHOOL - PLUMBING CONSTRUCTION - PART 1**  
**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE HIGH SCHOOL - PLUMBING CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

( \$ _____ )	DOLLARS
<b>BASE BID</b>	
Work of the Base Bid is the provision of all plumbing construction work required relative to the renovation of rooms T-1, T-2, T-11, T-12, T-25, T-26, T-17, T-18, T-21, T-22, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- PLUMBING CONSTRUCTION -  
PART 1

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**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)**

- A. In addition to the Work provided within the above Base Bid, the undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from the Base Bid quantities.

1. Unit Price No. PC-1: Remove unusable, broken, or cracked sanitary waste piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  2. Unit Price No. PC-2: Remove unusable, broken, or cracked sanitary waste piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  3. Unit Price No. PC-3: Remove unusable, broken, or cracked domestic water piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  4. Unit Price No. PC-4: Remove unusable, broken, or cracked domestic water piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  5. Unit Price No. PC-5: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 3.5" diameter and smaller. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  6. Unit Price No. PC-6: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 4" diameter and larger. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager
-



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- PLUMBING CONSTRUCTION -  
PART 1

\$ \_\_\_\_\_ per 10 feet of pipe.

7. Unit Price No. PC-7: Insulate existing piping NPS 3.5" diameter and smaller.

\$ \_\_\_\_\_ per lineal foot of pipe.

8. Unit Price No. PC-8: Insulate existing piping NPS 4" diameter and larger.

\$ \_\_\_\_\_ per lineal foot of pipe.

### 1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. PC-1: Provide all plumbing construction work required relative to the renovation of rooms 122, 123, 124, 119, 120, 142A, 144A, 146, T-19, T-20, T-20A.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

2. Alternate No. PC-2: Provide all plumbing construction work required relative to the renovation of the Girls' Locker Room and the Boys' Locker Room.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

3. Alternate No. PC-3: Provide all plumbing construction work required relative to the renovation of rooms T-15, T-16, 126B, 126C, T-23, T-24, T-13, T-14, 126A, and associated Janitor's Closets.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

### 1.08 BID SECURITY

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

### 1.09 IRAN DIVESTMENT ACT CERTIFICATION

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

### 1.10 REPRESENTATIONS

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- PLUMBING CONSTRUCTION -  
PART 1

- 
3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
    1. Corporation, Partnership, Individual.
    2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.
-



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- PLUMBING CONSTRUCTION -  
PART 1

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –  
POUGHKEEPSIE HIGH SCHOOL  
- PLUMBING CONSTRUCTION -  
PART 1

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**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
---

Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
-----

Email Address:
----------------

Signature and Title of Contractor:
------------------------------------

Date:
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**END OF SECTION**



FORM OF PROPOSAL – EARLY  
LEARNING CENTER - GENERAL  
CONSTRUCTION

**SECTION 00 4007**

**FORM OF PROPOSAL – EARLY LEARNING CENTER - GENERAL CONSTRUCTION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **EARLY LEARNING CENTER - GENERAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all general construction work, including associated hazardous material abatement, required for the renovation of rooms 006, 007, 032, 033, 118, 119, 214, 215, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as



FORM OF PROPOSAL – EARLY  
LEARNING CENTER - GENERAL  
CONSTRUCTION

indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. GC-1: Abate mudded joint packing (elbows) and/or pipe insulation.

\$ per lineal foot.

2. Unit Price No. GC-2: Remove existing roof curb, modify roof system, install new curb (curb supplied by others), and flash-in new curb (curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square).

\$ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. GC-1: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms 102, 104, 106, 111, 209.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered



FORM OF PROPOSAL – EARLY  
LEARNING CENTER - GENERAL  
CONSTRUCTION

by the Architect.

4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.



FORM OF PROPOSAL – EARLY  
LEARNING CENTER - GENERAL  
CONSTRUCTION**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL – EARLY  
LEARNING CENTER - GENERAL  
CONSTRUCTION

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the “Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012” list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
--

Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
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SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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FORM OF PROPOSAL –EARLY  
LEARNING CENTER -  
MECHANICAL CONSTRUCTION

**SECTION 00 4008**

**FORM OF PROPOSAL –EARLY LEARNING CENTER - MECHANICAL CONSTRUCTION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. \_\_\_\_\_ having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **EARLY LEARNING CENTER - MECHANICAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

( \$ _____ )	DOLLARS
BASE BID	
Work of the Base Bid is the provision of all mechanical construction work required for the renovation of rooms 006, 007, 032, 033, 118, 119, 214, 215, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –EARLY  
LEARNING CENTER -  
MECHANICAL CONSTRUCTION**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. In addition to the Work provided within the above Base Bid, the undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from the Base Bid quantities.

1. Unit Price No. MC-1: Supply mechanical equipment roof curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square.

\$ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. MC-1: Provide all mechanical construction required relative to the renovation of rooms 102, 104, 106, 111, 209.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.



FORM OF PROPOSAL –EARLY  
LEARNING CENTER -  
MECHANICAL CONSTRUCTION

3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.



FORM OF PROPOSAL –EARLY  
LEARNING CENTER -  
MECHANICAL CONSTRUCTION

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –EARLY  
LEARNING CENTER -  
MECHANICAL CONSTRUCTION

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**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the “Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012” list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
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SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
ELECTRICAL CONSTRUCTION

**SECTION 00 4009**

**FORM OF PROPOSAL – EARLY LEARNING CENTER - ELECTRICAL CONSTRUCTION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **EARLY LEARNING CENTER - ELECTRICAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

( \$ _____ )	DOLLARS
BASE BID	
Work of the Base Bid is the provision of all electrical construction work required relative to the renovation of rooms 006, 007, 032, 033, 118, 119, 214, 215, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
ELECTRICAL CONSTRUCTION**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

**1.06 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. EC-1: Provide all electrical construction work required relative to the renovation of rooms 102, 104, 106, 111, 209.

ADD/DEDUCT ( \$

)

DOLLARS

**1.07 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.08 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.09 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:



FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
ELECTRICAL CONSTRUCTION

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.10 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.11 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.12 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.13 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.14 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.15 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:
Name of Business or Firm:
Address:



FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
ELECTRICAL CONSTRUCTION

Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.16 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.17 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.18 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.19 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.20 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:



FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
ELECTRICAL CONSTRUCTION

1. That each bidder/contractor/assignee is not on the “Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012” list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

**1.21 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



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FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
PLUMBING CONSTRUCTION

**SECTION 00 4010**

**FORM OF PROPOSAL – EARLY LEARNING CENTER - PLUMBING CONSTRUCTION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **EARLY LEARNING CENTER - PLUMBING CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
BASE BID	
Work of the Base Bid is the provision of all plumbing construction work required relative to the renovation of rooms 006, 007, 032, 033, 118, 119, 214, 215, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL – EARLY  
LEARNING CENTER -  
PLUMBING CONSTRUCTION

14078.09

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**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. PC-1: Remove unusable, broken, or cracked sanitary waste piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
2. Unit Price No. PC-2: Remove unusable, broken, or cracked sanitary waste piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
3. Unit Price No. PC-3: Remove unusable, broken, or cracked domestic water piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
4. Unit Price No. PC-4: Remove unusable, broken, or cracked domestic water piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
5. Unit Price No. PC-5: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 3.5" diameter and smaller. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
6. Unit Price No. PC-6: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 4" diameter and larger. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager  
\$ per 10 feet of pipe.



FORM OF PROPOSAL – EARLY  
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7. Unit Price No. PC-7: Insulate existing piping NPS 3.5" diameter and smaller.

\$ \_\_\_\_\_ per lineal foot of pipe.

8. Unit Price No. PC-8: Insulate existing piping NPS 4" diameter and larger.

\$ \_\_\_\_\_ per lineal foot of pipe.

#### 1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. PC-1: Provide all plumbing construction work required relative to the renovation of rooms 102, 104, 106, 111, 209.

ADD/DEDUCT ( \$ _____ )	
	DOLLARS

#### 1.08 BID SECURITY

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

#### 1.09 IRAN DIVESTMENT ACT CERTIFICATION

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

#### 1.10 REPRESENTATIONS

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and



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- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  - 1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - 1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - 2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  - 3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  - 1. Corporation, Partnership, Individual.
  - 2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	



FORM OF PROPOSAL – EARLY  
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**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:	
Addendum #	Dated:	
Addendum #	Dated:	
Addendum #	Dated:	

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:



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1. That each bidder/contractor/assignee is not on the “Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012” list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
GENERAL CONSTRUCTION -  
PART 1

**SECTION 00 4011**

**FORM OF PROPOSAL – COLUMBUS SCHOOL - GENERAL CONSTRUCTION - PART 1**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **COLUMBUS SCHOOL - GENERAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
BASE BID	
Work of the Base Bid is the provision of all general construction work, including associated hazardous material abatement, required for the renovation of rooms 019, 119, 219, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
GENERAL CONSTRUCTION -  
PART 1

within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. GC-1: Abate mudded joint packing (elbows) and/or pipe insulation.

\$ \_\_\_\_\_ per lineal foot.

2. Unit Price No. GC-2: Remove existing roof curb, modify roof system, install new curb (curb supplied by others), and flash-in new curb (curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square).

\$ \_\_\_\_\_ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. GC-1: Provide all general construction work, including associated hazardous material abatement, required to renovate room 118A.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

2. Alternate No. GC-2: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms 010, 110, 210, 113A, and associated Janitor's Closets.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
GENERAL CONSTRUCTION -  
PART 1

- 
2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.
-



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
GENERAL CONSTRUCTION -  
PART 1

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**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

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FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
GENERAL CONSTRUCTION -  
PART 1

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**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
---

Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**

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FORM OF PROPOSAL  
-COLUMBUS SCHOOL -  
MECHANICAL CONSTRUCTION -  
PART 1

**SECTION 00 4012**  
**FORM OF PROPOSAL -COLUMBUS SCHOOL - MECHANICAL CONSTRUCTION - PART 1**  
**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **COLUMBUS SCHOOL - MECHANICAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

( \$ )	DOLLARS
BASE BID	
Work of the Base Bid is the provision of all mechanical construction work required relative to the renovation of rooms 019, 119, 219, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as



FORM OF PROPOSAL  
-COLUMBUS SCHOOL -  
MECHANICAL CONSTRUCTION -  
PART 1

indicated in the project schedule.

### 1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

### 1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)

- A. In addition to the Work provided within the above Base Bid, the Undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from the Base Bid quantities.

1. Unit Price No. MC-1: Supply mechanical equipment roof curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square.

\$

per curb

### 1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. MC-1: Provide all mechanical construction work required relative to the renovation of room 118A.

ADD/DEDUCT ( \$

)

DOLLARS

2. Alternate No. MC-2: Provide all mechanical construction work required relative to the renovation of rooms 010, 110, 210, 113A, and associated Janitor's Closets.

ADD/DEDUCT ( \$

)

DOLLARS

### 1.08 BID SECURITY

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

### 1.09 IRAN DIVESTMENT ACT CERTIFICATION

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

### 1.10 REPRESENTATIONS

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract



FORM OF PROPOSAL  
-COLUMBUS SCHOOL -  
MECHANICAL CONSTRUCTION -  
PART 1

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Documents.

3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

#### **1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

#### **1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

#### **1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

#### **1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

#### **1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
    1. Corporation, Partnership, Individual.
    2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this
-



FORM OF PROPOSAL  
-COLUMBUS SCHOOL -  
MECHANICAL CONSTRUCTION -  
PART 1

State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL  
-COLUMBUS SCHOOL -  
MECHANICAL CONSTRUCTION -  
PART 1

--

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
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SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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**SECTION 00 4013**

**FORM OF PROPOSAL – COLUMBUS SCHOOL - ELECTRICAL CONSTRUCTION - PART 1**

## PART 1 GENERAL

## 1.01 SUMMARY

- A. Fill in information:

Date:	
TO:	
OWNER NAME & ADDRESS:	
FROM:	
BIDDER NAME & ADDRESS	

## 1.02 GENERAL

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_
1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **COLUMBUS SCHOOL - ELECTRICAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

Terms and Conditions shall be Contract Documents for the following sum:		DOLLARS
( \$	)	
BASE BID		
Work of the Base Bid is the provision of all electrical construction work required relative to the renovation of rooms 019, 119, 219, and associated Janitor's Closets.		

### 1.03 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
ELECTRICAL CONSTRUCTION -  
PART 1

---

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

**1.06 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. EC-1: Provide all electrical construction work required relative to the renovation of room 118A.

ADD/DEDUCT ( \$

)

DOLLARS

2. Alternate No. EC-2: Provide all electrical construction work required relative to the renovation of rooms 010, 110, 210, 113A, and associated Janitor's Closets.

ADD/DEDUCT ( \$

)

DOLLARS

**1.07 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.08 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.09 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
-



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
ELECTRICAL CONSTRUCTION -  
PART 1

- 
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.10 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
1. Profit and overhead as permitted in the General Conditions.

**1.11 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.12 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.13 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.14 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
ELECTRICAL CONSTRUCTION -  
PART 1

**1.15 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.16 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.17 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.18 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.19 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
ELECTRICAL CONSTRUCTION -  
PART 1

--

**1.20 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.21 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
PLUMBING CONSTRUCTION -  
PART 1

**SECTION 00 4014**

**FORM OF PROPOSAL – COLUMBUS SCHOOL - PLUMBING CONSTRUCTION - PART 1**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:

TO:

OWNER NAME & ADDRESS:


FROM:

BIDDER NAME & ADDRESS


**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to COLUMBUS SCHOOL - PLUMBING CONSTRUCTION WORK - PART 1 as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all plumbing construction work required relative to the renovation of rooms 019, 119, 219, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
PLUMBING CONSTRUCTION -  
PART 1

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**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. PC-1: Remove unusable, broken, or cracked sanitary waste piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  2. Unit Price No. PC-2: Remove unusable, broken, or cracked sanitary waste piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  3. Unit Price No. PC-3: Remove unusable, broken, or cracked domestic water piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  4. Unit Price No. PC-4: Remove unusable, broken, or cracked domestic water piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  5. Unit Price No. PC-5: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 3.5" diameter and smaller. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  6. Unit Price No. PC-6: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 4" diameter and larger. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager
-



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
PLUMBING CONSTRUCTION -  
PART 1

\$ \_\_\_\_\_ per 10 feet of pipe.

7. Unit Price No. PC-7: Insulate existing piping NPS 3.5" diameter and smaller.

\$ \_\_\_\_\_ per lineal foot of pipe.

8. Unit Price No. PC-8: Insulate existing piping NPS 4" diameter and larger.

\$ \_\_\_\_\_ per lineal foot of pipe.

#### 1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. PC-1: Provide all plumbing construction work required relative to the renovation of room 118A.

ADD/DEDUCT ( \$ _____ )	
	DOLLARS

2. Alternate No. PC-2: Provide all plumbing construction work required relative to the renovation of rooms 010, 110, 210, 113, and associated Janitor's Closets.

ADD/DEDUCT ( \$ _____ )	
	DOLLARS

#### 1.08 BID SECURITY

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

#### 1.09 IRAN DIVESTMENT ACT CERTIFICATION

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

#### 1.10 REPRESENTATIONS

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
PLUMBING CONSTRUCTION -  
PART 1

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:
Name of Business or Firm:



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
PLUMBING CONSTRUCTION -  
PART 1

Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –  
COLUMBUS SCHOOL -  
PLUMBING CONSTRUCTION -  
PART 1

---

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
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SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
------------------------------------

Date:
-------

**END OF SECTION**



**SECTION 00 4015**  
**FORM OF PROPOSAL – CLINTON ES - GENERAL CONSTRUCTION**

## PART 1 GENERAL

## 1.01 SUMMARY

- A. Fill in information:

Date:	
TO:	
OWNER NAME & ADDRESS:	
FROM:	
BIDDER NAME & ADDRESS	

## 1.02 GENERAL

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work,  
hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to  
**CLINTON ELEMENTARY SCHOOL - GENERAL CONSTRUCTION WORK** as required  
by and in strict accord with the applicable provisions of the Drawings and Specifications all  
to the satisfaction and approval of the Architect and the Owner in accordance with the  
terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all general construction work, including associated hazardous material abatement, required for the renovation of rooms 007, 016, 104, 120, 204, 211, and associated Janitor's Closets.	

### 1.03 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

#### 1.04 TIME OF COMPLETION

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as



FORM OF PROPOSAL –  
CLINTON ES - GENERAL  
CONSTRUCTION

indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. GC-1: Abate mudded joint packing (elbows) and/or pipe insulation.

\$ per lineal foot.

2. Unit Price No. GC-2: Remove existing roof curb, modify roof system, install new curb (curb supplied by others), and flash-in new curb (curbs for roof openings 10 inches by 10 inches to 20 inches x 20 inches square.

\$ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. GC-1: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms 105, 111A, 114A, 115A.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered



FORM OF PROPOSAL –  
CLINTON ES - GENERAL  
CONSTRUCTION

by the Architect.

4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.



FORM OF PROPOSAL –  
CLINTON ES - GENERAL  
CONSTRUCTION**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –  
CLINTON ES - GENERAL  
CONSTRUCTION

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
------------------

Signature of Representative of Firm or Corporation:
---

Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
-------------------------------

Notary Public Signature and Stamp:
------------------------------------

**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
---------------------

Name of Business or Firm:
---------------------------

Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
------------------------------------

Date:
-------

**END OF SECTION**



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FORM OF PROPOSAL  
-CLINTON ES - MECHANICAL  
CONSTRUCTION

**SECTION 00 4016**  
**FORM OF PROPOSAL -CLINTON ES - MECHANICAL CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **CLINTON ELEMENTARY SCHOOL - MECHANICAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
BASE BID	
Work of the Base Bid is the provision of all mechanical work required relative to the renovation of rooms 007, 016, 104, 120, 204, 211, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as



FORM OF PROPOSAL  
-CLINTON ES - MECHANICAL  
CONSTRUCTION

indicated in the project schedule.

### 1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

### 1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)

- A. In addition to the Work provided within the above Base Bid, the Undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from the Base Bid quantities.

1. Unit Price No. MC-1: Supply mechanical equipment roof curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square.

\$ \_\_\_\_\_ per curb

### 1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. MC-1: Provide all mechanical construction work required relative to the renovation of rooms 105, 111A, 114A, 115A.

ADD/DEDUCT ( \$ _____ )	
	DOLLARS

### 1.08 BID SECURITY

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

### 1.09 IRAN DIVESTMENT ACT CERTIFICATION

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

### 1.10 REPRESENTATIONS

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case



FORM OF PROPOSAL  
-CLINTON ES - MECHANICAL  
CONSTRUCTION

of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:

Name of Business or Firm:



FORM OF PROPOSAL  
–CLINTON ES - MECHANICAL  
CONSTRUCTION

Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:



FORM OF PROPOSAL  
–CLINTON ES - MECHANICAL  
CONSTRUCTION

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



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FORM OF PROPOSAL –  
CLINTON ES - ELECTRICAL  
CONSTRUCTION

**SECTION 00 4017**  
**FORM OF PROPOSAL – CLINTON ES - ELECTRICAL CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **CLINTON ELEMENTARY SCHOOL - ELECTRICAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled (Insert project title Here) all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
BASE BID	
Work of the Base Bid is the provision of all electrical construction work required relative to the renovation of rooms 007, 016, 104, 120, 204, 211, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
CLINTON ES - ELECTRICAL  
CONSTRUCTION**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. EC-1: Provide all electrical construction work required relative to the renovation of rooms 105, 111A, 114A, 115A.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.07 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.08 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.09 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:



FORM OF PROPOSAL –  
CLINTON ES - ELECTRICAL  
CONSTRUCTION

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.10 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.11 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.12 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.13 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.14 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.15 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:
Name of Business or Firm:
Address:



FORM OF PROPOSAL –  
CLINTON ES - ELECTRICAL  
CONSTRUCTION

Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.16 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.17 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.18 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.19 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.20 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:



FORM OF PROPOSAL –  
CLINTON ES - ELECTRICAL  
CONSTRUCTION

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

#### 1.21 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



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FORM OF PROPOSAL –  
CLINTON ES - PLUMBING  
CONSTRUCTION

**SECTION 00 4018**  
**FORM OF PROPOSAL – CLINTON ES - PLUMBING CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **CLINTON ELEMENTARY SCHOOL - PLUMBING CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

( \$ _____ )	DOLLARS
BASE BID	
Work of the Base Bid is the provision of all plumbing construction work required relative to the renovation of rooms 007, 016, 104, 120, 204, 211, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.



FORM OF PROPOSAL –  
CLINTON ES - PLUMBING  
CONSTRUCTION**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. PC-1: Remove unusable, broken, or cracked sanitary waste piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
2. Unit Price No. PC-2: Remove unusable, broken, or cracked sanitary waste piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
3. Unit Price No. PC-3: Remove unusable, broken, or cracked domestic water piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
4. Unit Price No. PC-4: Remove unusable, broken, or cracked domestic water piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
5. Unit Price No. PC-5: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 3.5" diameter and smaller. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
6. Unit Price No. PC-6: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 4" diameter and larger. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ per 10 feet of pipe.
7. Unit Price No. PC-7: Insulate existing piping NPS 3.5" diameter and smaller.  
\$ per lineal foot of pipe.
8. Unit Price No. PC-8: Insulate existing piping NPS 4" diameter and larger.  
\$ per lineal foot of pipe.



FORM OF PROPOSAL –  
CLINTON ES - PLUMBING  
CONSTRUCTION**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.
1. Alternate No. PC-1: Provide all plumbing construction work required relative to the renovation of rooms 105, 111A, 114A, 115A.

ADD/DEDUCT ( \$	)
DOLLARS	

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.



FORM OF PROPOSAL –  
CLINTON ES - PLUMBING  
CONSTRUCTION

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**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.
-



FORM OF PROPOSAL –  
CLINTON ES - PLUMBING  
CONSTRUCTION

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
- That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:



FORM OF PROPOSAL –  
CLINTON ES - PLUMBING  
CONSTRUCTION

---

Signature of Representative of Firm or Corporation:
---

Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
---------------------

Name of Business or Firm:
---------------------------

Address:
----------

Telephone:
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Fax
-----

Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



**SECTION 00 4019**  
**FORM OF PROPOSAL – POUGHKEEPSIE MIDDLE SCHOOL - GENERAL CONSTRUCTION - PART**  
**1**

## PART 1 GENERAL

## 1.01 SUMMARY

- A. Fill in information:

Date:	
TO:	
OWNER NAME & ADDRESS:	
FROM:	
BIDDER NAME & ADDRESS	

## 1.02 GENERAL

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,  
we.

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE MIDDLE SCHOOL - GENERAL CONSTRUCTION - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all general construction work, including associated hazardous material abatement, required for the renovation of rooms B59, B61, B65, B66, 127, 128, 135, 136, 214, 215, 315, 316, and associated Janitor's Closets.	

### 1.03 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - GENERAL  
CONSTRUCTION - PART 1

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. GC-1: Abate mudded joint packing (elbows) and/or pipe insulation.

\$ \_\_\_\_\_ per lineal foot.

2. Unit Price No. GC-2: Remove existing roof curb, modify roof system, install new curb (curb supplied by others), and flash-in new curb (curbs for openings 10 inches x 10 inches square to 20 inches x 20 inches square).

\$ \_\_\_\_\_ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. GC-1: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms B36, B68, B69, 140, 141, 142, 221, 222, 322, 323.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

2. Alternate No. GC-2: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms B17, B18, B12, B25, 165, 166, 246, 247, 343, 344, 108A, 108B, and associated Janitor's Closets.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - GENERAL  
CONSTRUCTION - PART 1

1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

#### **1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

#### **1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - GENERAL  
CONSTRUCTION - PART 1

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**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:

---



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - GENERAL  
CONSTRUCTION - PART 1

Date:

If Corporation – provide Seal:

### 1.21 IRAN DIVESTMENT ACT CERTIFICATION

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the “Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012” list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

### 1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - GENERAL  
CONSTRUCTION - PART 1

---

Signature and Title of Contractor:
------------------------------------

Date:
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**END OF SECTION**



FORM OF PROPOSAL  
 –POUGHKEEPSIE MIDDLE  
 SCHOOL - MECHANICAL  
 CONSTRUCTION - PART 1

**SECTION 00 4020**  
**FORM OF PROPOSAL –POUGHKEEPSIE MIDDLE SCHOOL - MECHANICAL CONSTRUCTION -**  
**PART 1**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE MIDDLE SCHOOL - MECHANICAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
BASE BID	
Work of the Base Bid is the provision of all mechanical construction work required relative to the renovation of rooms B59, B61, B65, B66, 127, 128, 135, 136, 214, 215, 315, 316, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL  
-POUGHKEEPSIE MIDDLE  
SCHOOL - MECHANICAL  
CONSTRUCTION - PART 1

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. In addition to the Work provided in the above Base Bid, the Undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from Base Bid quantities.

1. Unit Price No. MC-1: Supply mechanical equipment roof curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square.

\$ \_\_\_\_\_ per curb

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. MC-1: Provide all mechanical construction work required relevant to the renovation of rooms B36, B68, B69, 140, 141, 142, 221, 222, 322, 323.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

2. Alternate No. MC-2: Provide all mechanical construction work required relevant to the renovation of rooms B17, B18, B12, B25, 165, 166, 246, 247, 343, 344, 108A, 108B, and associated Janitor's Closets.

ADD/DEDUCT ( \$ \_\_\_\_\_ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.



FORM OF PROPOSAL  
-POUGHKEEPSIE MIDDLE  
SCHOOL - MECHANICAL  
CONSTRUCTION - PART 1

2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.



FORM OF PROPOSAL  
-POUGHKEEPSIE MIDDLE  
SCHOOL - MECHANICAL  
CONSTRUCTION - PART 1

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**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

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FORM OF PROPOSAL  
 –POUGHKEEPSIE MIDDLE  
 SCHOOL - MECHANICAL  
 CONSTRUCTION - PART 1

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**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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**SECTION 00 4021**  
**FORM OF PROPOSAL – POUGHKEEPSIE MIDDLE SCHOOL - ELECTRICAL CONSTRUCTION -**  
**PART 1**

## PART 1 GENERAL

## 1.01 SUMMARY

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

## 1.02 GENERAL

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,  
we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE MIDDLE SCHOOL - ELECTRICAL CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all electrical construction work required relevant to the renovation of rooms B59, B61, B65, B66, 127, 128, 135, 136, 214, 215, 315, 316, and associated Janitor's Closets.	

### 1.03 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - ELECTRICAL  
CONSTRUCTION - PART 1

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**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

**1.06 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. EC-1: Provide all electrical construction work required relative to the renovation of rooms B36, B68, B69, 140, 141, 142, 221, 222, 322, 323.

ADD/DEDUCT ( \$

)

DOLLARS

2. Alternate No. EC-2: Provide all electrical construction work required relative to the renovation of rooms B17, B18, B12, B25, 165, 166, 246, 247, 343, 344, 108A, 108B, and associated Janitor's Closets.

ADD/DEDUCT ( \$

)

DOLLARS

**1.07 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.08 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.09 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
-



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - ELECTRICAL  
CONSTRUCTION - PART 1

3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.10 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.11 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.12 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.13 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.14 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - ELECTRICAL  
CONSTRUCTION - PART 1

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**1.15 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.16 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.17 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.18 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.19 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

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FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - ELECTRICAL  
CONSTRUCTION - PART 1

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**1.20 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.21 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - PLUMBING  
CONSTRUCTION - PART 1

**SECTION 00 4022**

**FORM OF PROPOSAL – POUGHKEEPSIE MIDDLE SCHOOL - PLUMBING CONSTRUCTION - PART**

**1**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we,

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **POUGHKEEPSIE MIDDLE SCHOOL - PLUMBING CONSTRUCTION WORK - PART 1** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ )	
BASE BID	
Work of the Base Bid is the provision of all plumbing construction work required relevant to the renovation of rooms B59, B61, B65, B66, 127, 128, 135, 136, 214, 215, 315, 316, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - PLUMBING  
CONSTRUCTION - PART 1

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**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ \_\_\_\_\_ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. PC-1: Remove unusable, broken, or cracked sanitary waste piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  2. Unit Price No. PC-2: Remove unusable, broken, or cracked sanitary waste piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  3. Unit Price No. PC-3: Remove unusable, broken, or cracked domestic water piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  4. Unit Price No. PC-4: Remove unusable, broken, or cracked domestic water piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  5. Unit Price No. PC-5: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 3.5" diameter and smaller. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.  
\$ \_\_\_\_\_ per 10 feet of pipe.
  6. Unit Price No. PC-6: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 4" diameter and larger. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager
-



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - PLUMBING  
CONSTRUCTION - PART 1

\$ \_\_\_\_\_ per 10 feet of pipe.

7. Unit Price No. PC-7: Insulate existing piping NPS 3.5" diameter and smaller.

\$ \_\_\_\_\_ per lineal foot of pipe.

8. Unit Price No. PC-8: Insulate existing piping NPS 4" diameter and larger.

\$ \_\_\_\_\_ per lineal foot of pipe.

#### 1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. PC-1: Provide all plumbing construction work required relevant to the renovation of rooms B36, B68, B69, 140, 141, 142, 221, 222, 322, 323.

ADD/DEDUCT ( \$ \_\_\_\_\_ )

DOLLARS

2. Alternate No. PC-2: Provide all plumbing construction work required relevant to the renovation of rooms B17, B18, B12, B25, 165, 166, 246, 247, 343, 344, 108A, 108B, and associated Janitor's Closets.

ADD/DEDUCT ( \$ \_\_\_\_\_ )

DOLLARS

#### 1.08 BID SECURITY

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

#### 1.09 IRAN DIVESTMENT ACT CERTIFICATION

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

#### 1.10 REPRESENTATIONS

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - PLUMBING  
CONSTRUCTION - PART 1

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:
Name of Business or Firm:



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - PLUMBING  
CONSTRUCTION - PART 1

Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –  
POUGHKEEPSIE MIDDLE  
SCHOOL - PLUMBING  
CONSTRUCTION - PART 1

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**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
--

Mailing Address:
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Signature of Representative of Firm or Corporation:
---

Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



FORM OF PROPOSAL –  
WARRING ES - GENERAL  
CONSTRUCTION

**SECTION 00 4023**  
**FORM OF PROPOSAL – WARRING ES - GENERAL CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **WARRING ELEMENTARY SCHOOL - GENERAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

( \$ _____ )	DOLLARS
BASE BID	
Work of the Base Bid is the provision of all general construction work, including associated hazardous material abatement, required for the renovation of rooms 123, 124, 221, 222, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as



FORM OF PROPOSAL –  
WARRING ES - GENERAL  
CONSTRUCTION

indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. GC-1: Abate mudded joint packing (elbows) and/or pipe insulation.

\$ per lineal foot

2. Unit Price No. GC-2: Remove existing curb, modify roof system, install new curb (curb supplied by others), and flash-in new curb (curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square).

\$ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. GC-1: Provide all general construction work, including associated hazardous material abatement, required to renovate rooms 019, 022, 028, 103, 109, 208.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered



FORM OF PROPOSAL –  
WARRING ES - GENERAL  
CONSTRUCTION

by the Architect.

4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
  - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
  - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

#### 1.11 CHANGE ORDERS

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

#### 1.12 NON-COLLUSIVE BIDDING CERTIFICATION

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

#### 1.13 ACCEPTANCE

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

#### 1.14 AFFIRMS

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

#### 1.15 TYPE OF BUSINESS

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.



FORM OF PROPOSAL –  
WARRING ES - GENERAL  
CONSTRUCTION**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:



FORM OF PROPOSAL –  
WARRING ES - GENERAL  
CONSTRUCTION

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
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Mailing Address:
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Signature of Representative of Firm or Corporation:
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Printed Name and Title:
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Date:
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SWORN to before me this date:
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Notary Public Signature and Stamp:
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**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
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Name of Business or Firm:
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Address:
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Telephone:
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Fax
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Email Address:
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Signature and Title of Contractor:
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Date:
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**END OF SECTION**



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FORM OF PROPOSAL –  
WARRING ES - MECHANICAL  
CONSTRUCTION

**SECTION 00 4024**  
**FORM OF PROPOSAL – WARRING ES - MECHANICAL CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **WARRING ELEMENTARY SCHOOL - MECHANICAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
BASE BID	
Work of the Base Bid is the provision of all mechanical construction work relative to the renovation of rooms 123, 124, 221, 222, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as



FORM OF PROPOSAL –  
WARRING ES - MECHANICAL  
CONSTRUCTION

indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012700)**

- A. In addition to the Work provided within the above Base Bid, the Undersigned agrees to provide the following work in accordance with the Drawings and Specifications. Unit prices will be used as an add or deduct value from the Base Bid quantities.

1. Unit Price No. MC-1: Supply mechanical equipment roof curbs for roof openings 10 inches x 10 inches square to 20 inches x 20 inches square.

\$ per curb.

**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. MC-1: Provide all mechanical construction work required relative to the renovation of rooms 019, 022, 028, 103, 109, 208.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case



FORM OF PROPOSAL –  
WARRING ES - MECHANICAL  
CONSTRUCTION

of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:

Name of Business or Firm:



FORM OF PROPOSAL –  
WARRING ES - MECHANICAL  
CONSTRUCTION

Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:



FORM OF PROPOSAL –  
WARRING ES - MECHANICAL  
CONSTRUCTION

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



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FORM OF PROPOSAL –  
WARRING ES - ELECTRICAL  
CONSTRUCTION

**SECTION 00 4025**  
**FORM OF PROPOSAL – WARRING ES - ELECTRICAL CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:

TO:

OWNER NAME &amp; ADDRESS:


FROM:

BIDDER NAME &amp; ADDRESS


**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **WARRING ELEMENTARY SCHOOL - ELECTRICAL CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all electrical construction work required relevant to the renovation of rooms 123, 124, 221, 222, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.



FORM OF PROPOSAL –  
WARRING ES - ELECTRICAL  
CONSTRUCTION**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.

**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$ (Insert Amount)

**1.06 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.

1. Alternate No. EC-1: Provide all electrical construction work required relative to the renovation of rooms 019, 022, 028, 103, 109, 208.

ADD/DEDUCT ( \$ )  
DOLLARS

**1.07 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.08 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.09 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:



FORM OF PROPOSAL –  
WARRING ES - ELECTRICAL  
CONSTRUCTION

- a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
- c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

**1.10 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
  1. Profit and overhead as permitted in the General Conditions.

**1.11 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
  1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.12 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.13 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.14 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
  1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.15 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:
Name of Business or Firm:
Address:



FORM OF PROPOSAL –  
WARRING ES - ELECTRICAL  
CONSTRUCTION

Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.16 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

**1.17 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.18 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.19 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

**1.20 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:



FORM OF PROPOSAL –  
WARRING ES - ELECTRICAL  
CONSTRUCTION

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

SWORN to before me this date:

Notary Public Signature and Stamp:

#### 1.21 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:

Name of Business or Firm:

Address:

Telephone:

Fax

Email Address:

Signature and Title of Contractor:

Date:

**END OF SECTION**



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FORM OF PROPOSAL –  
WARRING ES - PLUMBING  
CONSTRUCTION

**SECTION 00 4026**  
**FORM OF PROPOSAL – WARRING ES - PLUMBING CONSTRUCTION**

**PART 1 GENERAL****1.01 SUMMARY**

- A. Fill in information:

Date:

TO:

OWNER NAME &amp; ADDRESS:


FROM:

BIDDER NAME &amp; ADDRESS


**1.02 GENERAL**

- A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not, we, \_\_\_\_\_

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to **WARRING ELEMENTARY SCHOOL - PLUMBING CONSTRUCTION WORK** as required by and in strict accord with the applicable provisions of the Drawings and Specifications all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
( \$ _____ )	
<b>BASE BID</b>	
Work of the Base Bid is the provision of all plumbing construction work required relative to the renovation of rooms 123, 124, 221, 222, and associated Janitor's Closets.	

**1.03 BID GUARANTEE**

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.
1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

**1.04 TIME OF COMPLETION**

- A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he will start work within 10 consecutive calendar days of this notice to proceed and fully complete the work as indicated in the project schedule.



FORM OF PROPOSAL –  
WARRING ES - PLUMBING  
CONSTRUCTION**1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)**

- A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.

1. Allowance Amount:

\$

(Insert Amount)

**1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)**

- A. Enter in unit prices from spec section 012700. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)

1. Unit Price No. PC-1: Remove unusable, broken, or cracked sanitary waste piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.

\$ per 10 feet of pipe.

2. Unit Price No. PC-2: Remove unusable, broken, or cracked sanitary waste piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.

\$ per 10 feet of pipe.

3. Unit Price No. PC-3: Remove unusable, broken, or cracked domestic water piping, NPS 3.5" diameter and smaller, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.

\$ per 10 feet of pipe.

4. Unit Price No. PC-4: Remove unusable, broken, or cracked domestic water piping, NPS 4" diameter and larger, and replace with new piping of the same size and material as the piping that was removed, including scheduled insulation. Determination of whether or not a pipe is unusable shall be made by the Owner, Engineer, and/or Construction Manager.

\$ per 10 feet of pipe.

5. Unit Price No. PC-5: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 3.5" diameter and smaller. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.

\$ per 10 feet of pipe.

6. Unit Price No. PC-6: Remove plumbing systems, including, but not limited to: waste, vent, domestic cold water, and domestic hot water; including piping, hangers, accessories, etc., for systems with piping NPS 4" diameter and larger. Determination of whether or not a plumbing system shall be removed shall be made by the Owner, Engineer, and/or Construction Manager.

\$ per 10 feet of pipe.

7. Unit Price No. PC-7: Insulate existing piping NPS 3.5" diameter and smaller.

\$ per lineal foot of pipe.

8. Unit Price No. PC-8: Insulate existing piping NPS 4" diameter and larger.

\$ per lineal foot of pipe.



FORM OF PROPOSAL –  
WARRING ES - PLUMBING  
CONSTRUCTION**1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)**

- A. Enter a whole dollar amount, even if it is zero (\$ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.
1. Alternate No. PC-1: Provide all plumbing construction work required relative to the renovation of rooms 019, 022, 028, 103, 109, 208.

ADD/DEDUCT ( \$	)
DOLLARS	

**1.08 BID SECURITY**

- A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

**1.09 IRAN DIVESTMENT ACT CERTIFICATION**

- A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

**1.10 REPRESENTATIONS**

- A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
  2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
  3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
  4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
    - a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
    - b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
    - c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
    - d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.



FORM OF PROPOSAL –  
WARRING ES - PLUMBING  
CONSTRUCTION

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**1.11 CHANGE ORDERS**

- A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
1. Profit and overhead as permitted in the General Conditions.

**1.12 NON-COLLUSIVE BIDDING CERTIFICATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
  2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
  3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

**1.13 ACCEPTANCE**

- A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

**1.14 AFFIRMS**

- A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

**1.15 TYPE OF BUSINESS**

- A. The undersigned hereby represents that it is a (select with circle):
1. Corporation, Partnership, Individual.
  2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

**1.16 PLACE OF BUSINESS**

- A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

**1.17 EXECUTION OF CONTRACT**

- A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.
-



FORM OF PROPOSAL –  
WARRING ES - PLUMBING  
CONSTRUCTION

**1.18 ADDENDA**

- A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:
Addendum #	Dated:

**1.19 ASBESTOS**

- A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

**1.20 AUTHORIZED SIGNATURES FOR PROPOSALS**

Individual or Legal Name of Firm or Corporation:

Signature of Representative of Firm or Corporation:

Printed Name and Title:

Date:

If Corporation – provide Seal:

**1.21 IRAN DIVESTMENT ACT CERTIFICATION**

- A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:
- That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at <http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf> and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:

Mailing Address:



FORM OF PROPOSAL –  
WARRING ES - PLUMBING  
CONSTRUCTION

---

Signature of Representative of Firm or Corporation:
---

Printed Name and Title:
-------------------------

Date:
-------

SWORN to before me this date:
-------------------------------

Notary Public Signature and Stamp:
------------------------------------

**1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION**

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:
---------------------

Name of Business or Firm:
---------------------------

Address:
----------

Telephone:
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Fax
-----

Email Address:
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Signature and Title of Contractor:
------------------------------------

Date:
-------

**END OF SECTION**



**SECTION 00 4510  
ASBESTOS NOTIFICATION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Attached Asbestos Notification form.
  - 1. The attached form shall be submitted to the Architect/Engineer by each Contractor in accordance with the Contract Documents prior to performing any work.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**







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**ASBESTOS NOTIFICATION**

**THE ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA) REQUIRES SCHOOL DISTRICTS TO INFORM ALL NON-DISTRICT EMPLOYEES (CONTRACTORS, VENDORS, ETC.) WHO PERFORM SHORT TERM WORK IN A SCHOOL BUILDING OF THE LOCATIONS OF ANY KNOWN OR ASSUMED ASBESTOS CONTAINING BUILDING MATERIALS IN THE SCHOOL. EXPOSURE TO ASBESTOS FIBERS CAN BE HAZARDOUS TO ONE'S HEALTH AND TO THE HEALTH OF THE BUILDING OCCUPANTS. *PRECAUTIONS MUST BE TAKEN TO PREVENT THE DISTURBANCE OF ASBESTOS CONTAINING BUILDING MATERIALS.***

**THE OWNER HAS AN ASBESTOS MANAGEMENT PLAN THAT INDICATES THE SPECIFIC LOCATIONS WHERE ASBESTOS IS KNOWN TO EXIST.**

**PLEASE PROCEED WITH CAUTION AND REMEMBER THAT THE OWNER'S BUILDINGS ARE FOR CHILDREN. NO WORK MAY BEGIN, UNTIL THE CONTRACTOR CERTIFIES, BY SIGNATURE BELOW, THAT THEY:**

Have contacted the Owner's Facilities Director to inform him/her of the scope of work.

Have been informed by the Owner's Facilities Director of any known asbestos containing materials.

Will take adequate measures to prevent the disturbance of asbestos fibers to the largest extent possible.

Will inform any sub-contractors of the location of any asbestos containing materials and will require these sub-contractors to take adequate measures to prevent the disturbance of asbestos fibers.

Will immediately contact the Owner's Facilities Director if asbestos fibers are disturbed.

<b>NAME OF CONTRACTOR (PRINTED)</b>	
<b>TITLE (PRINTED)</b>	
<b>ADDRESS OF CONTRACTOR (PRINTED)</b>	
<b>ADDRESS OF CONTRACTOR (PRINTED)</b>	
<b>SIGNATURE</b>	<b>DATE</b>







**SECTION 00 5200  
A132 AGREEMENT COVER(CMA)****PART 1 GENERAL****1.01 SUMMARY**

- A. The following is a "Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition," AIA Document A132 - 2019, is bound with this Section. AIA Document A132 – 2019 is a standard form of agreement between Owner and Contractor for use on projects where the basis of payment is a stipulated sum (fixed price), and where, in addition to the Contractor and the Architect, a Construction Manager assists the Owner in an advisory capacity during design and construction. The document has been prepared for use with A232 – 2019 , General Conditions of the Contract for Construction, Construction Manager-as Adviser Edition. This integrated set of documents is for use on projects where the Construction Manager only serves in the capacity of an adviser to the Owner, rather than as constructor.

**PART 2 PRODUCTS (NOT APPLICABLE)****PART 3 EXECUTION (NOT APPLICABLE)****END OF SECTION**



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# AIA® Document A132™ – 2019

## **Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition**

**AGREEMENT** made as of the    day of    in the year  
(In words, indicate day, month, and year.)

**BETWEEN** the Owner:  
(Name, legal status, address, and other information)

Poughkeepsie City School District  
18 South Perry Street  
Poughkeepsie, NY 12603

and the Contractor:  
(Name, legal status, address, and other information)

for the following Project:  
(Name, location, and detailed description)

2020 Capital Improvement Project  
Phase 1B: Building Improvements

Early Learning Center  
372 Church Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-008-022

Clinton Elementary School  
100 Montgomery Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-004-014

Columbus School  
18 South Perry Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-001-014

Krieger Elementary School  
265 Hooker Avenue  
Poughkeepsie, NY 12603  
SED # 13-15-00-01-0-006-014

Morse Elementary School  
101 Mansion Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-002-014

Warring Elementary School  
283 Mansion Street

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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User Notes: (1431448363)



Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-005-013

Poughkeepsie Middle School  
55 College Avenue  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-015-021

Poughkeepsie High School  
70 Forbus Street  
Poughkeepsie, NY 12603  
SED # 13-15-00-01-0-007-018

The Construction Manager:  
*(Name, legal status, address, and other information)*

The Architect:  
*(Name, legal status, address, and other information)*

CPL  
50 Front Street, Suite 202  
Newburgh, NY 12550

The Owner and Contractor agree as follows.

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*(Paragraph deleted)*

### ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

### ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

### ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

*(Check one of the following boxes.)*

- ☐ The date of this Agreement.
- ☐ A date set forth in a notice to proceed issued by the Owner.
- ☐ Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

#### § 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

*(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)*

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§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of all of the Contractors for the Project are to be completed prior to Substantial Completion of the entire Work of all of the Contractors for the Project, the Contractors shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
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**§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete**

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

*(Check one of the following boxes and complete the necessary information.)*

☐ Not later than ( ) calendar days from the date of commencement of the Work.

☐ By the following date:

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete
-----------------	-----------------------------------

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

**ARTICLE 4 CONTRACT SUM**

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:

*(Check the appropriate box.)*

☐ Stipulated Sum, in accordance with Section 4.2 below

☐ Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

☐ Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

*(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)*

**§ 4.2 Stipulated Sum**

§ 4.2.1 The Contract Sum shall be (\$ ), subject to additions and deductions as provided in the Contract Documents.

**§ 4.2.2 Alternates**

§ 4.2.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

*(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance
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§ 4.2.3 Allowances, if any, included in the Contract Sum:  
(Identify each allowance.)

Item	Price
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§ 4.2.4 Unit prices, if any:  
(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price

§ 4.3.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.3.2 The Contractor's Fee:  
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:

§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

§ 4.3.5 Rental rates for Contractor-owned equipment shall not exceed percent ( %) of the standard rental rate paid at the place of the Project.

§ 4.3.6 Unit prices, if any:  
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
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§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager, within 14 days of executing this Agreement, a written Control Estimate for the Owner's review and approval. The Control Estimate shall include the items in Section B.1 of Exhibit B, Determination of the Cost of the Work.

§ 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price

§ 4.4.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.4.2 The Contractor's Fee:  
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:

§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

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§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed percent ( %) of the standard rental rate paid at the place of the Project.

§ 4.4.6 Unit Prices, if any:

*(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*

Item	Units and Limitations	Price per Unit (\$0.00)
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§ 4.4.7 Guaranteed Maximum Price

§ 4.4.7.1 The Contract Sum is guaranteed by the Contractor not to exceed (\$ ), subject to additions and deductions by Change Order as provided in the Contract Documents. This maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.

§ 4.4.7.2 Alternates

§ 4.4.7.2.1 Alternates, if any, included in the Guaranteed Maximum Price:

Item	Price
------	-------

§ 4.4.7.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

*(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance
------	-------	---------------------------

§ 4.4.7.3 Allowances, if any, included in the Guaranteed Maximum Price:

*(Identify each allowance.)*

Item	Price
------	-------

§ 4.4.7.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based:

*(Identify each assumption.)*

§ 4.4.8 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.

§ 4.4.9 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 4.4.7.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 4.4.7.4 and the revised Contract Documents.

§ 4.5 Liquidated damages, if any:

*(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)*

§ 4.6 Other:

*(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)*

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## **ARTICLE 5 PAYMENTS**

### **§ 5.1 Progress Payments**

**§ 5.1.1** Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and Certificates for Payment issued by the Construction Manager and Architect, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

**§ 5.1.2** The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

**§ 5.1.3** Provided that an Application for Payment is received by the Construction Manager not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Construction Manager receives the Application for Payment.

*(Federal, state or local laws may require payment within a certain period of time.)*

### **§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum**

**§ 5.1.4.1** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 5.1.4.2** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

**§ 5.1.4.3** In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**§ 5.1.4.3.1** The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

**§ 5.1.4.3.2** The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and
- .5 Retainage withheld pursuant to Section 5.1.7.

### **§ 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price**

**§ 5.1.5.1** With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit B, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices, or invoices with

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check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor, plus payrolls for the period covered by the present Application for Payment, less that portion of the payments attributable to the Contractor's Fee.

§ 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

§ 5.1.5.3 In accordance with AIA Document A232-2019 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.5.3.1 The amount of each progress payment shall first include:

- .1 The Cost of the Work as described in Exhibit B, Determination of the Cost of the Work;
- .2 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- .3 The Contractor's Fee computed upon the Cost of the Work described in the preceding Section 5.1.5.3.1.1 at the rate stated in Section 4.3.2; or if the Contractor's Fee is stated as a fixed sum in Section 4.3.2 an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work included in Section 5.1.5.3.1.1 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 5.1.5.3.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232-2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232-2019;
- .5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.5.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor, and such action shall not be deemed to be a representation that (1) the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; (2) that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.5.6 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.5.7 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.



**§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price**

**§ 5.1.6.1** With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

**§ 5.1.6.2** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.

**§ 5.1.6.2.1** The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 5.1.6.2.2** The allocation of the Guaranteed Maximum Price under this Section 5.1.6.2 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

**§ 5.1.6.2.3** When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Architect and Construction Manager.

**§ 5.1.6.3** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work and for which the Contractor has made payment or intends to make payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

**§ 5.1.6.4** In accordance with AIA Document A232-2019, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**§ 5.1.6.4.1** The amount of each progress payment shall first include:

- .1 That portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;
- .2 That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- .4 The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

**§ 5.1.6.4.2** The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232-2019;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232-2019;

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- .5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.6.5 The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and such action shall not be deemed to be a representation that (1) the Construction Manager or Architect have made a detailed examination, audit, or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; (2) that the Construction Manager or Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.6.7 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.6.8 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

#### § 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

§ 5.1.7.1.1 The following items are not subject to retainage:

*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

*(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)*

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:

*(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)*

#### § 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

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- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232-2019, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

§ 5.2.1.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

**§ 5.2.2 Final Payment Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price**

§ 5.2.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232-2019, and to satisfy other requirements, if any, which extend beyond final payment;
- .2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit B, Determination of the Cost of the Work and a final Application for Payment; and
- .3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect in accordance with Exhibit B, Determination of the Cost of the Work.

§ 5.2.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.  
(Insert rate of interest agreed upon, if any.)

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**ARTICLE 6 DISPUTE RESOLUTION**

**§ 6.1 Initial Decision Maker**

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232-2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

**§ 6.2 Binding Dispute Resolution**

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232-2019, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

- ☐ Arbitration pursuant to Article 15 of AIA Document A232-2019.
- ☐ Litigation in a court of competent jurisdiction.
- ☐ Other: (Specify)

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If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

## **ARTICLE 7 TERMINATION OR SUSPENSION**

### **§ 7.1 Where the Contract Sum is a Stipulated Sum**

**§ 7.1.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

**§ 7.1.1.1** If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)*

**§ 7.1.2** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

### **§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price**

#### **§ 7.2.1 Termination**

**§ 7.2.1.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

#### **§ 7.2.1.2 Termination by the Owner for Cause**

**§ 7.2.1.2.1** If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232–2019, the Owner shall then only pay the Contractor an amount as follows:

- .1** Take the Cost of the Work incurred by the Contractor to the date of termination;
- .2** Add the Contractor's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;
- .3** Subtract the aggregate of previous payments made by the Owner; and
- .4** Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A232–2019.

**§ 7.2.1.2.2** When the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, if the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232–2019, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A232–2019 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.1.2.1.

**§ 7.2.1.2.3** The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders. All Subcontracts, purchase orders and rental agreements entered into by the Contractor will contain provisions allowing for assignment to the Owner as described above.

#### **§ 7.2.1.3 Termination by the Owner for Convenience**

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of or method for determining the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)*



### § 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

## ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

### § 8.2 The Owner's representative:

*(Name, address, email address, and other information)*

### § 8.3 The Contractor's representative:

*(Name, address, email address, and other information)*

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

### § 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132™–2019, Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

*(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

### § 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of

Init.



workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

**ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS**

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A132™-2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition
- .2 AIA Document A132™-2019, Exhibit A, Insurance and Bonds Exhibit
- .3 AIA Document A232™-2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition
- .4 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

Number	Title	Date
--------	-------	------

.6 Specifications

Section	Title	Date	Pages
---------	-------	------	-------

.7 Addenda, if any:

Number	Date	Pages
--------	------	-------

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

☐ AIA Document A132™-2019, Exhibit B, Determination of the Cost of the Work

☐ AIA Document E235™-2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:  
(Insert the date of the E235-2019 incorporated into this Agreement.)

☐ The Sustainability Plan:

Title	Date	Pages
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☐ Supplementary and other Conditions of the Contract:

Init.



Document

Title

Date

Pages

- .9 Other documents, if any, listed below:  
*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232-2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

This Agreement is entered into as of the day and year first written above.

\_\_\_\_\_  
OWNER (Signature)

\_\_\_\_\_  
CONTRACTOR (Signature)

\_\_\_\_\_  
(Printed name and title)

\_\_\_\_\_  
(Printed name and title)

init.







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**SECTION 00 6000**  
**PROJECT FORMS AND RELATED DOCUMENTS****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section lists the project forms used for administration of the project.

**1.02 FORMS**

- A. The following forms are provided in this Section:
1. FRONT END SUBMITTAL LOG
  2. REQUEST FOR INFORMATION (RFI) FORM
  3. SUBCONTRACTOR LIST
  4. ALLOWANCE DISBURSEMENT AUTHORIZATION FORM
  5. SUBSTITUTION REQUEST FORM
  6. SUBMITTAL COVER
  7. INFORMATION BULLETIN
  8. AIA FORMS (Forms provided are samples. Original AIA Documents shall be used):
    - a. Contractor's Qualification Statement (AIA Document A305).
    - b. Bid Bond (AIA Document A310).
    - c. Performance Bond (AIA Document A312).
    - d. Change Order (AIA Document G701/CMA).
    - e. Application and Certificate for Payment (AIA Document G732 and Continuation Sheet (AIA Document G703).
    - f. Certification of Substantial Completion - Construction Manager-Advisor Edition (AIA Document G704/CMA).
    - g. Contractor's Affidavit of Payment of Debts and Claims (AIA Document G706).
    - h. Contractor's Affidavit of Release of Liens (AIA Document G706A).
    - i. Consent of Surety to Final Payment (AIA Document G707).
    - j. Work Changes Proposal Request (AIA Document G709).
    - k. Architect's Supplemental Instructions (AIA Document G710).
    - l. Construction Change Directive (AIA Document G714).
    - m. Supplemental Attachment for ACORD Certificate of Insurance 25-S (AIA Document G715).

**PART 2 PRODUCTS (NOT USED)****PART 3 EXECUTION****3.01 PROCEDURES**

- A. Front End Submittal Log: This document is a checklist of the required submissions. Refer to Bidding Requirements, Section entitled "Instructions to Bidders" and Division 1, Specification Section entitled "SUBMITTAL PROCEDURES" for submission procedures.
- B. Project Request For Information (RFI) Form: This form is to be used for information requests. The forms are filled out by any party to the contract and sent to the Architect/Engineer. The Architect/Engineer shall number RFI before processing.
- C. Subcontractor List: This document is to be used identify subcontractors. The forms are filled out by each Prime Contractor for all proposed subcontractors and sent to the Architect/Engineer in accordance with. Division 1, section entitled "SUBMITTAL PROCEDURES"
- D. Allowance Disbursement Authorization Form: the Architect/Engineer shall issue this document after all parties have agreed to the conditions of change to be charged to the Allowance Amount in accordance with Division 1, section entitled "ALLOWANCES", if required.
-



- E. Substitution Request Form: This document is to be used for a Contractor to propose substitutions. The forms are filled out by each Prime Contractor and sent to the Architect/Engineer in accordance with. Division 1, section entitled "SUBMITTAL PROCEDURES" and "PRODUCT REQUIREMENTS".
- F. Submittal Cover: This document is to be used for submittal submissions. The forms are filled out by each Prime Contractor and sent to the Architect/Engineer in accordance with. Division 1, section entitled "SUBMITTAL PROCEDURES"
- G. Information Bulletin: The Architect/Engineer shall issue this document for 3 actions.
  - 1. PROPOSAL REQUEST: A quotations for changes in the Contract Sum and / or proposed modifications to the Contract Documents
  - 2. SUPPLEMENTAL INSTRUCTIONS: Instructions for changes to the Contract Documents without additional cost or time
  - 3. CONSTRUCTION CHANGE AUTHORIZATION: A directive to immediately proceed with changes to the work of the contract and to submit final cost for inclusion into a Change Order

**END OF SECTION**





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## FRONT END SUBMITTAL LOG

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### POUGHKEEPSIE CITY SCHOOL DISTRICT 2020 Capital Improvement Project Phase 1B: Building Improvements

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Contractor Name: \_\_\_\_\_

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#### SUBMISSIONS

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Submission	Date		Remarks
	Submitted	Approved	
Contract:			
Schedule of Values:			
Bonds:			
Insurance:			
Workers Compensation:			
Automobile Insurance:			
Safety Program:			
Construction Schedule:			
Submittal Schedule:			
Emergency Contact:			
Substitution List:			
Subcontractor List:			
Project Manager:			
Superintendent:			

*This log is to be used by the Contractor to monitor and complete the required front-end submissions.*







<b>REQUEST FOR INFORMATION</b>	<b>RFI No:</b>
	<b>Date:</b>

**POUGHKEEPSIE CITY SCHOOL DISTRICT**  
**2020 Capital Improvement Project**  
**Phase 1B: Building Improvements**

Contract: \_\_\_\_\_

To: \_\_\_\_\_

From: \_\_\_\_\_

Copies to: \_\_\_\_\_

**WE REQUEST YOUR ATTENTION (OR CONFIRMATION) REGARDING THE FOLLOWING:**  
*(Fully describe the question or type of information requested)*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*(List specific documents researched when seeking the information requested.)*

Specifications: \_\_\_\_\_ Drawings: \_\_\_\_\_

Other: \_\_\_\_\_

Sender's Recommendation: \_\_\_\_\_

Receiver's Reply: \_\_\_\_\_

Note: This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order or a Construction Change Directive must be executed in accordance with the Contract Documents.

By: \_\_\_\_\_ Date: \_\_\_\_\_









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**SUBCONTRACTOR LIST**

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**POUGHKEEPSIE CITY SCHOOL DISTRICT**

**2020 Capital Improvement Project**

**Phase 1B: Building Improvements**

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To:

**CPL**

50 Front Street, Suite 202  
Newburgh, New York 12550

From:

(Contractor) \_\_\_\_\_

Contractors No.: \_\_\_\_\_

Contract For: \_\_\_\_\_

---

List Subcontractors proposed for use on this Project as required by the Construction Documents.  
Attach supplemental sheets if necessary.

---

Section  
No.: \_\_\_\_\_ Section Title: \_\_\_\_\_  
Firm  
Name: \_\_\_\_\_ Con-  
tact: \_\_\_\_\_  
Address: \_\_\_\_\_

---

Section  
No.: \_\_\_\_\_ Section Title: \_\_\_\_\_  
Firm  
Name: \_\_\_\_\_ Con-  
tact: \_\_\_\_\_  
Address: \_\_\_\_\_

---

Section  
No.: \_\_\_\_\_ Section Title: \_\_\_\_\_  
Firm  
Name: \_\_\_\_\_ Con-  
tact: \_\_\_\_\_  
Address: \_\_\_\_\_

---

Section  
No.: \_\_\_\_\_ Section Title: \_\_\_\_\_  
Firm  
Name: \_\_\_\_\_ Con-  
tact: \_\_\_\_\_  
Address: \_\_\_\_\_

---

Section  
No.: \_\_\_\_\_ Section Title: \_\_\_\_\_

---

☐ Attachment(s)

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Copies: ☐ Owner ☐ Consultants ☐ File  
☐ ☐ ☐

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## ALLOWANCE DISBURSEMENT AUTHORIZATION

Owner \_\_\_\_\_  
Architect/Engineer \_\_\_\_\_  
Contractor \_\_\_\_\_  
Field \_\_\_\_\_  
Other \_\_\_\_\_  
Other \_\_\_\_\_

### **POUGHKEEPSIE CITY SCHOOL DISTRICT 2020 Capital Improvement Project Phase 1B: Building Improvements**

Allowance Disbursement No. \_\_\_\_\_ Initiation Date: \_\_\_\_\_

Contract For: \_\_\_\_\_

To Contractor: \_\_\_\_\_

Contract Date: \_\_\_\_\_

*Not valid until signed by Owner, Architect/Engineer, and Contractor.*

The Original Contract Allowance \_\_\_\_\_

Net Allowance Disbursements previously authorized \_\_\_\_\_

Charges to Contract Allowance as a result of this authorization \_\_\_\_\_

Current Contract Allowance Balance including this authorization \_\_\_\_\_

Owner: \_\_\_\_\_

Architect/Engineer: \_\_\_\_\_  
(Clark Patterson Lee)

Contractor: \_\_\_\_\_









SUBSTITUTION REQUEST FORM

**POUGHKEEPSIE CITY SCHOOL DISTRICT**  
**2020 Capital Improvement Project**  
**Phase 1B: Building Improvements**

To: **CPL** From: \_\_\_\_\_  
50 Front Street, Suite 202 (Contractor) \_\_\_\_\_  
Newburgh, New York 12550 \_\_\_\_\_

Re: \_\_\_\_\_ Substitution Request Number: \_\_\_\_\_

Contract For: \_\_\_\_\_

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_

Section Number: \_\_\_\_\_ Page: \_\_\_\_\_ Part/Paragraph: \_\_\_\_\_

Proposed Substitution: \_\_\_\_\_

Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Trade Name: \_\_\_\_\_ Model No.: \_\_\_\_\_

Installer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☐ More than 10 years old

Differences between proposed substitution and specified product: \_\_\_\_\_

☐ Point-by-point comparative data attached

Reason for not providing specified item: \_\_\_\_\_

Similar Installation:

Project: \_\_\_\_\_ Architect/Engineer: \_\_\_\_\_

Contractor: \_\_\_\_\_ Owner: \_\_\_\_\_

\_\_\_\_\_ Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work: ☐ No  
☐ Yes, explain \_\_\_\_\_

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_)

Proposed substitution changes Contract Time: ☐ Yes; explain ☐ No ☐ Yes [Add] [Deduct] \_\_\_\_\_ days

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ \_\_\_\_\_

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.



- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted By: \_\_\_\_\_

Signed By: \_\_\_\_\_

Firm: \_\_\_\_\_

Address \_\_\_\_\_

Phone: \_\_\_\_\_

Attachments: \_\_\_\_\_

---

#### REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed By: \_\_\_\_\_ Date: \_\_\_\_\_

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#### Additional

**Comments:** ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ Architect/Engineer

☐

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# SUBMITTAL COVER SHEET

(Attach to each copy of each submittal)

## Clark Patterson Lee

50 Front Street, Suite 202  
Newburgh, New York 12550  
Phone: (800) 274 - 9000



**Clark Patterson Lee**  
DESIGN PROFESSIONALS

Submittal No. \_\_\_\_\_

Contractor: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone / Fax: ( ) \_\_\_\_\_ ( ) \_\_\_\_\_

Architect Project No: 14078.09

Contractor's Number: \_\_\_\_\_

Project Name:  
Poughkeepsie City School District  
2020 Capital Improvement Project  
Phase 1B: Building Improvements

### TYPE OF SUBMITTAL

(Check one)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Product Data  | <input type="checkbox"/> Color Samples   | <input type="checkbox"/> O&M Manual      |
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Product Samples | <input type="checkbox"/> Record Document |
| <input type="checkbox"/> Other         |  |  |

**DATE RECEIVED BY  
ARCHITECT:** \_\_\_\_\_

**DATE RETURNED TO  
CONTRACTOR:** \_\_\_\_\_

### SUBSTITUTION

See General Conditions

☐ YES ☐ NO

### PRODUCT IDENTIFICATION

Specification Section No: \_\_\_\_\_

Part/Paragraph: \_\_\_\_\_

Contract Dwg. Number: \_\_\_\_\_

Detail Reference: \_\_\_\_\_

Product: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

### CONTRACTOR'S APPROVAL

This submittal has been reviewed and approved by the Contractor in accordance with the General Conditions.

**By:** \_\_\_\_\_ **Date:** \_\_\_\_\_

### DEVIATION FROM CONTRACT DOCUMENTS:

### CONTRACTOR COMMENTS:

### FOR USE BY CPL

#### ARCHITECT/ENGINEER'S STAMP

- |   |  |
|---|--|
| <input type="checkbox"/> No Exception Taken   | <input type="checkbox"/> Revise & Resubmit |
| <input type="checkbox"/> Furnish as Corrected | <input type="checkbox"/> Rejected          |

Corrections or comments made on the submittal during this review do not relieve the Contractor from compliance with the requirements of the Contract Documents. This review is only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

**Clark Patterson Lee**

Date: \_\_\_\_\_ By: \_\_\_\_\_

### ARCHITECT/ENGINEER'S COMMENTS:









## INFORMATION BULLETIN

PROJECT: Poughkeepsie City School District INFORMATION BULLETIN NO.: \_\_\_\_\_  
2020 Capital Improvement Project  
Phase 1B: Building Improvements  
 OWNER: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ARCHITECT'S PROJECT NO.: 14078.09  
 CONTRACTOR: \_\_\_\_\_ CONTRACT NO.: \_\_\_\_\_  
 CONTRACT DATE: \_\_\_\_\_

DESCRIPTION:

ATTACHMENT(S):

### ACTION

- ☐ 1. **PROPOSAL REQUEST:** Submit an itemized quotation for changes in the Contract Sum and/or time required to implement the above proposed modifications to the Contract Documents. This is not authorization to proceed with the work.
- ☐ 2. **SUPPLEMENTAL INSTRUCTIONS:** Implement the above instructions without change to the Contract Sum and/or Time. Prior to proceeding, indicate acceptance below and return one copy to the Architect.
- ☐ 3. **CONSTRUCTION CHANGE AUTHORIZATION:** Proceed with the above described changes to the Contract Documents immediately. Submit final costs and/or change in Contract Time for inclusion in a subsequent Change Order.

Methods: ☐ Lump Sum ☐ Unit Price ☐ Time & Material Not-to-Exceed

Change in Contract Sum of \_\_\_\_\_

Change in Contract Time of \_\_\_\_\_ days

ISSUED:

ACCEPTED:

AUTHORIZED:

AUTHORIZED:

BY: \_\_\_\_\_

BY: \_\_\_\_\_

BY: \_\_\_\_\_

BY: \_\_\_\_\_

Architect Date  
Required for Actions 1,2,3

Owner Date  
Required for Action 3

Contractor Date  
Required for Actions 2,3

Const. Mgr. Date  
Required for Actions 1,2,3

☐ Owner ☐ Architect ☐ Structural ☐ Civil ☐ Construction Manager  
☐ Contractor ☐ Field ☐ Mechanical/Electrical ☐ Other ☐ Other









# AIA® Document A305™ – 1986

## Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

**SUBMITTED TO:**

**ADDRESS:**

**SUBMITTED BY:**

**NAME:**

**ADDRESS:**

**PRINCIPAL OFFICE:**

- ☐ Corporation
- ☐ Partnership
- ☐ Individual
- ☐ Joint Venture
- ☐ Other

**NAME OF PROJECT (if applicable):**

**TYPE OF WORK** (file separate form for each Classification of Work):

- ☐ General Construction
- ☐ HVAC
- ☐ Electrical
- ☐ Plumbing
- ☐ Other (please specify)

### § 1. ORGANIZATION

§ 1.1 How many years has your organization been in business as a Contractor?

§ 1.2 How many years has your organization been in business under its present business name?

§ 1.2.1 Under what other or former names has your organization operated?

§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation:

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.



- § 1.3.2 State of incorporation:
- § 1.3.3 President's name:
- § 1.3.4 Vice-president's name(s)

- § 1.3.5 Secretary's name:
- § 1.3.6 Treasurer's name:

§ 1.4 If your organization is a partnership, answer the following:

- § 1.4.1 Date of organization:
- § 1.4.2 Type of partnership (if applicable):
- § 1.4.3 Name(s) of general partner(s)

§ 1.5 If your organization is individually owned, answer the following:

- § 1.5.1 Date of organization:
- § 1.5.2 Name of owner:

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

## § 2. LICENSING

§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

## § 3. EXPERIENCE

§ 3.1 List the categories of work that your organization normally performs with its own forces.

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?



§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

§ 3.4.1 State total worth of work in progress and under contract:

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

§ 3.5.1 State average annual amount of construction work performed during the past five years:

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

#### § 4. REFERENCES

§ 4.1 Trade References:

§ 4.2 Bank References:

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

§ 4.3.2 Name and address of agent:

#### § 5. FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;



Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsiary).

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

**§ 6. SIGNATURE**

§ 6.1 Dated at this      day of

Name of Organization:

By:

Title:

§ 6.2

M      being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this      day of      20

Notary Public:

My Commission Expires:





# AIA<sup>®</sup> Document A310<sup>™</sup> – 1970

## ***Bid Bond***

KNOW ALL MEN BY THESE PRESENTS, that we  
*(Here insert full name and address or legal title of Contractor)*

as Principal, hereinafter called the Principal, and  
*(Here insert full name and address or legal title of Surety)*

a corporation duly organized under the laws of the State of \_\_\_\_\_ as Surety, hereinafter  
called the Surety, are held and firmly bound unto  
*(Here insert full name and address or legal title of Owner)*

as Oblige, hereinafter called the Oblige, in the sum of (\$ \_\_\_\_\_), for the payment of  
which sum well and truly to be made, the said Principal and the said Surety, bind  
ourselves, our heirs, executors, administrators, successors and assigns, jointly and  
severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for  
*(Here insert full name, address and description of project)*

NOW, THEREFORE, if the Oblige shall accept the bid of the Principal and the  
Principal shall enter into a Contract with the Oblige in accordance with the terms of  
such bid, and give such bond or bonds as may be specified in the bidding or Contract  
Documents with good and sufficient surety for the faithful performance of such Contract  
and for the prompt payment of labor and material furnished in the prosecution thereof, or  
in the event of the failure of the Principal to enter such Contract and give such bond or  
bonds, if the Principal shall pay to the Oblige the difference not to exceed the penalty  
hereof between the amount specified in said bid and such larger amount for which the  
Oblige may in good faith contract with another party to perform the Work covered by  
said bid, then this obligation shall be null and void, otherwise to remain in full force and  
effect.

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.



Signed and sealed this       day of       ,

_____	_____
(Witness)	(Principal) (Seal)
_____	_____
(Witness)	(Title)
_____	_____
(Witness)	(Surety)
_____	_____
	(Title) (Seal)



**AIA<sup>®</sup>****Document A312<sup>™</sup> – 1984****Performance Bond****CONTRACTOR** (*Name and Address*):**SURETY** (*Name and Principal Place of Business*):**OWNER** (*Name and Address*):**CONSTRUCTION CONTRACT**

Date:

Amount:

Description (*Name and Location*):—**BOND**Date (*Not earlier than Construction Contract Date*):

Amount:

Modifications to this Bond: ☒ None ☐ See Last Page**CONTRACTOR AS PRINCIPAL**

Company: (Corporate Seal)

Signature: \_\_\_\_\_

Name and

Title:

*(Any additional signatures appear on the last page)***SURETY**

Company: (Corporate Seal)

Signature: \_\_\_\_\_

Name and

Title:

*(FOR INFORMATION ONLY - Name, Address and Telephone)***AGENT or BROKER:****OWNER'S REPRESENTATIVE***(Architect, Engineer or other party):***ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contract, Surety, Owner or other party shall be considered plural where applicable.



§ 1 The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Section 3.1.

§ 3 If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

§ 3.1 The Owner has notified the Contractor and the Surety at its address described in Section 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

§ 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Section 3.1; and

§ 3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

§ 4 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

§ 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

§ 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

§ 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

§ 5 If the Surety does not proceed as provided in Section 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 6 After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Section 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:



**§ 6.1** The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

**§ 6.2** Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 4; and

**§ 6.3** Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

**§ 7** The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.

**§ 8** The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

**§ 9** Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

**§ 10** Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

**§ 11** When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

## **§ 12 DEFINITIONS**

**§ 12.1** Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

**§ 12.2** Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

**§ 12.3** Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

**§ 12.4** Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.



**§ 13 MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:**

*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

**CONTRACTOR AS PRINCIPAL**

Company: *(Corporate Seal)*

**SURETY**

Company: *(Corporate Seal)*

Signature: \_\_\_\_\_  
Name and Title:  
Address:

Signature: \_\_\_\_\_  
Name and Title:  
Address:



**Payment Bond**

**CONTRACTOR** *(Name and Address):*

**SURETY** *(Name and Principal Place of Business):*

**OWNER** *(Name and Address):*

**CONSTRUCTION CONTRACT**

Date:

Amount:

Description *(Name and Location):*

**BOND**

Date *(Not earlier than Construction Contract Date):*

Amount:

Modifications to this Bond: ☒ None ☐ See Last Page

**CONTRACTOR AS PRINCIPAL**

Company: *(Corporate Seal)*

**SURETY**

Company: *(Corporate Seal)*

Signature: \_\_\_\_\_

Name and Title:

*(Any additional signatures appear on the last page)*

Signature: \_\_\_\_\_

Name and Title:

*(FOR INFORMATION ONLY - Name, Address and Telephone)*

**AGENT or BROKER:**

**OWNER'S REPRESENTATIVE** *(Architect, Engineer or other party):*



§ 1 The Contractor and the Surety, jointly and severally bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 With respect to the Owner, this obligation shall be null and void if the Contractor:

§ 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

§ 2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Section 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

§ 3 With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

§ 4 The Surety shall have no obligation to Claimants under this Bond until:

§ 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Section 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

§ 4.2 Claimants who do not have a direct contract with the Contractor:

- .1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
- .2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
- .3 Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Section 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

§ 5 If a notice required by Section 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

§ 6 When the Claimant has satisfied the conditions of Section 4, the Surety shall promptly and at the Surety's expense take the following actions:

§ 6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

§ 6.2 Pay or arrange for payment of any undisputed amounts.

§ 7 The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 8 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 9 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.



§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Section 4.1 or Section 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### § 15 DEFINITIONS

§ 15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

§ 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

#### § 16 MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

##### CONTRACTOR AS PRINCIPAL

Company: \_\_\_\_\_ (Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_

##### SURETY

Company: \_\_\_\_\_ (Corporate Seal)

Signature: \_\_\_\_\_  
Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_









# AIA® Document G701/CMa™ – 1992

## Change Order - Construction Manager-Adviser Edition

PROJECT (Name and address):	CHANGE ORDER NUMBER:	OWNER: <input type="checkbox"/>
	INITIATION DATE:	CONSTRUCTION MANAGER: <input type="checkbox"/>
		ARCHITECT: <input type="checkbox"/>
TO CONTRACTOR (Name and address):	PROJECT NUMBERS: /	CONTRACTOR: <input type="checkbox"/>
	CONTRACT DATE:	FIELD: <input type="checkbox"/>
	CONTRACT FOR:	OTHER: <input type="checkbox"/>

### THE CONTRACT IS CHANGED AS FOLLOWS:

The original Contract Sum was	\$	0
Net change by previously authorized Change Orders	\$	0.00
The Contract Sum prior to this Change Order was	\$	0.00
The Contract Sum will be increased by this Change Order in the amount of	\$	0.00
The new Contract Sum including this Change Order will be	\$	0.00

The Contract Time will be increased by Zero (0) days.  
The date of Substantial Completion as of the date of this Change Order therefore is .

**NOTE:** This summary does not reflect changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive.

**NOT VALID UNTIL SIGNED BY THE OWNER, CONSTRUCTION MANAGER, ARCHITECT AND CONTRACTOR.**

CONSTRUCTION MANAGER (Firm name)	ARCHITECT (Firm name)
ADDRESS	ADDRESS
BY (Signature)	BY (Signature)
(Typed name) DATE:	(Typed name) DATE:
CONTRACTOR (Firm name)	OWNER (Firm name)
ADDRESS	ADDRESS
BY (Signature)	BY (Signature)
(Typed name) DATE:	(Typed name) DATE:









# AIA Document G732™ - 2009

## Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:	PROJECT:	APPLICATION NO: 001	Distribution to:
FROM	VIA CONSTRUCTION	PERIOD TO:	OWNER: <input type="checkbox"/>
CONTRACTOR:	MANAGER:	CONTRACT DATE:	CONSTRUCTION MANAGER: <input type="checkbox"/>
CONTRACT FOR:	VIA ARCHITECT:	PROJECT NOS:	ARCHITECT: <input type="checkbox"/>
			CONTRACTOR: <input type="checkbox"/>
			FIELD: <input type="checkbox"/>
			OTHER: <input type="checkbox"/>

### CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM	\$0.00	CONTRACTOR:	
2. NET CHANGE BY CHANGE ORDERS	\$0.00	By:	
3. CONTRACT SUM TO DATE (Line 1 ± 2)	\$0.00	State of:	
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$0.00	County of:	

5. RETAINAGE:		Subscribed and sworn to before me this day of	
a. 0 % of Completed Work (Column D + E on G703)	\$0.00	Notary Public:	
b. 0 % of Stored Material (Column F on G703)	\$0.00	My Commission expires:	

Total Retainage (Lines 5a + 5b or Total in Column I of G703)	\$0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	\$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$0.00
8. CURRENT PAYMENT DUE	\$0.00

9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	\$0.00
AMOUNT CERTIFIED \$0.00	
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)	

By:	ARCHITECT:	Date:
By:	By:	Date:
This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.		
CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$0.00	\$0.00
Total approved this month including Construction Change Directives	\$0.00	\$0.00
TOTALS	\$0.00	\$0.00
NET CHANGES IN THE WORK		\$0.00







## Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

In tabulations below, amounts are stated to the nearest dollar.

Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:

APPLICATION DATE:

PERIOD TO:

ARCHITECT'S PROJECT NO:

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		E THIS PERIOD	F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G TOTAL COMPLETED AND STORED TO DATE (D+E+F)	H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					
	<b>GRAND TOTAL</b>								









# AIA® Document G704/CMa™ – 1992

## Certificate of Substantial Completion Construction Manager-Adviser Edition

**PROJECT:**  
(Name and address)

**PROJECT NUMBER:**        /  
**CONTRACT FOR:**  
**CONTRACT DATE:**

**OWNER:** ☐

**CONSTRUCTION MANAGER:** ☐

**ARCHITECT:** ☐

**TO OWNER:**  
(Name and address)

**TO CONTRACTOR:**  
(Name and address)

**CONTRACTOR:** ☐

**FIELD:** ☐

**OTHER:** ☐

**DATE OF ISSUANCE:**

**PROJECT OR DESIGNATED PORTION SHALL INCLUDE:**

The Work performed under this Contract has been reviewed and found, to the Construction Manager's and Architect's best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion thereof designated above is hereby established as which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

### Warranty

### Date of Commencement

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

_____ CONSTRUCTION MANAGER	BY _____	DATE _____
-------------------------------	----------	------------

_____ ARCHITECT	BY _____	DATE _____
--------------------	----------	------------

The Contractor will complete or correct the Work on the list of items attached hereto within \_\_\_\_\_ days from the above date of Substantial Completion.

_____ CONTRACTOR	BY _____	DATE _____
---------------------	----------	------------

The Owner accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at \_\_\_\_\_ (time) on \_\_\_\_\_ (date).

_____ OWNER	BY _____	DATE _____
----------------	----------	------------

The responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance shall be as follows:

(Note—Owner's and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.)









# AIA® Document G706™ – 1994

## Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER: ☐  
ARCHITECT: ☐  
CONTRACTOR: ☐  
SURETY: ☐  
OTHER: ☐

CONTRACT FOR:

TO OWNER: *(Name and address)*

CONTRACT DATED:

STATE OF:  
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

### EXCEPTIONS:

#### SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment ☐ Yes ☐ No

CONTRACTOR: *(Name and address)*

BY: \_\_\_\_\_  
*(Signature of authorized representative)*

*The following supporting documents should be attached hereto if required by the Owner:*

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.
3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

\_\_\_\_\_  
*(Printed name and title)*

Subscribed and sworn to before me on this date:

Notary Public:  
My Commission Expires:









# AIA<sup>®</sup> Document G706A<sup>™</sup> – 1994

## Contractor's Affidavit of Release of Liens

PROJECT: <i>(Name and address)</i>	ARCHITECT'S PROJECT NUMBER:	OWNER: <input type="checkbox"/>
		ARCHITECT: <input type="checkbox"/>
	CONTRACT FOR:	CONTRACTOR: <input type="checkbox"/>
TO OWNER: <i>(Name and address)</i>	CONTRACT DATED:	SURETY: <input type="checkbox"/>
		OTHER: <input type="checkbox"/>

STATE OF:  
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

### EXCEPTIONS:

#### SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

\_\_\_\_\_  
*(Signature of authorized representative)*

\_\_\_\_\_  
*(Printed name and title)*

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:









# AIA® Document G707™ – 1994

## Consent Of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER: ☐

ARCHITECT: ☐

CONTRACT FOR:

CONTRACTOR: ☐

TO OWNER: *(Name and address)*

CONTRACT DATED:

SURETY: ☐

OTHER: ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the  
*(Insert name and address of Surety)*

on bond of

*(Insert name and address of Contractor)*

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the  
Surety of any of its obligations to  
*(Insert name and address of Owner)*

, CONTRACTOR,

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:  
*(Insert in writing the month followed by the numeric date and year.)*

\_\_\_\_\_  
*(Surety)*

\_\_\_\_\_  
*(Signature of authorized representative)*

\_\_\_\_\_  
*(Printed name and title)*

Attest:

(Seal):









# AIA® Document G709™ – 2001

## Work Changes Proposal Request

PROJECT (Name and address):

PROPOSAL REQUEST NUMBER:

OWNER: ☐

ARCHITECT: ☐

DATE OF ISSUANCE:

CONSULTANT: ☐

CONTRACTOR: ☐

OWNER (Name and address):

CONTRACT FOR:

FIELD: ☐

OTHER: ☐

CONTRACT DATE:

FROM ARCHITECT (Name and address):

ARCHITECT'S PROJECT NUMBER:

TO CONTRACTOR (Name and address):

Please submit an itemized proposal for changes in the Contract Sum and Contract Time for proposed modifications to the Contract Documents described herein. Within ( ) days, the Contractor must submit this proposal or notify the Architect, in writing, of the date on which proposal submission is anticipated.

**THIS IS NOT A CHANGE ORDER, A CONSTRUCTION CHANGE DIRECTIVE OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED IN THE PROPOSED MODIFICATIONS.**

DESCRIPTION (Insert a written description of the Work):

ATTACHMENTS (List attached documents that support description):

REQUESTED BY THE ARCHITECT:

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Printed name and title)









# AIA<sup>®</sup> Document G710<sup>™</sup> – 2017

## Architect's Supplemental Instructions

---

**PROJECT:** *(name and address)*

**CONTRACT INFORMATION:**

Contract For:

Date:

**ASI INFORMATION:**

ASI Number: 001

Date:

**OWNER:** *(name and address)*

**ARCHITECT:** *(name and address)*

**CONTRACTOR:** *(name and address)*

---

The Contractor shall carry out the Work in accordance with the following supplemental instructions without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.

*(Insert a detailed description of the Architect's supplemental instructions and, if applicable, attach or reference specific exhibits.)*

---

**ISSUED BY THE ARCHITECT:**

\_\_\_\_\_  
**ARCHITECT** *(Firm name)*

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**PRINTED NAME AND TITLE**

\_\_\_\_\_  
**DATE**









# AIA<sup>®</sup> Document G714<sup>™</sup> – 2017

## Construction Change Directive

**PROJECT:** *(name and address)*

**CONTRACT INFORMATION:**

Contract For:

Date:

**CCD INFORMATION:**

Directive Number: 001

Date:

**OWNER:** *(name and address)*

**ARCHITECT:** *(name and address)*

**CONTRACTOR:** *(name and address)*

The Contractor is hereby directed to make the following change(s) in this Contract:

*(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits.)*

### PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:

☒ Lump Sum decrease of \$0.00

☐ Unit Price of \$        per

☐ Cost, as defined below, plus the following fee:

*(Insert a definition of, or method for determining, cost)*

☐ As follows:

2. The Contract Time is proposed to remain unchanged. The proposed adjustment, if any, is (0 days).

**NOTE:** *The Owner, Architect and Contractor should execute a Change Order to supersede this Construction Change Directive to the extent they agree upon adjustments to the Contract Sum, Contract Time, or Guaranteed Maximum price for the change(s) described herein.*

When signed by the Owner and Architect and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

Contractor signature indicates agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this CCD.

\_\_\_\_\_  
**ARCHITECT** *(Firm name)*

\_\_\_\_\_  
**OWNER** *(Firm name)*

\_\_\_\_\_  
**CONTRACTOR** *(Firm name)*

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**PRINTED NAME AND TITLE**

\_\_\_\_\_  
**PRINTED NAME AND TITLE**

\_\_\_\_\_  
**PRINTED NAME AND TITLE**

\_\_\_\_\_  
**DATE**

\_\_\_\_\_  
**DATE**

\_\_\_\_\_  
**DATE**









# AIA® Document G715™ – 2017

## Supplemental Attachment for ACORD Certificate of Insurance 25

<b>PROJECT:</b> (name and address)	<b>CONTRACT INFORMATION:</b> Contract For: Date:	<b>CERTIFICATE INFORMATION:</b> Producer: Insured: Date:
<b>OWNER:</b> (name and address)	<b>ARCHITECT:</b> (name and address)	<b>CONTRACTOR:</b> (name and address)

A. General Liability		Yes	No	N/A
1.	Does this policy include coverage for:			
a	Damages because of bodily injury, sickness, or disease, including occupational sickness or disease, and death of any person?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Personal injury and advertising injury?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Damages because of physical damage to or destruction of tangible property, including the loss of use of such property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	Bodily injury or property damage arising out of completed operations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	The Contractor's indemnity obligations included in the Contract Documents?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Does this policy contain an exclusion or restriction of coverage for:			
a	Claims by one insured against another insured, where the exclusion or restrictions is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Claims for bodily injury other than to employees of the insured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	Claims for the Contractor's indemnity obligations included in the Contract Documents arising out of injury to employees of the insured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	Claims for loss excluded under a prior work endorsement or other similar exclusionary language?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g	Claims related to residential, multi-family, or other habitational projects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h	Claims related to roofing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i	Claims related to exterior insulation finish systems, synthetic stucco, or similar exterior coatings or surfaces?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j	Claims related to earth subsistence or movement?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k	Claims related to explosion, collapse, and underground hazards?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Other Insurance Coverage		Yes	No	N/A
1.	Indicate whether the Contractor has the following insurance coverages and, if so, indicate the coverage limits for each.			
a	Professional liability insurance Coverage limits:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Pollution liability insurance Coverage limits:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Insurance for maritime liability risks associated with the operation of a vessel Coverage limits:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



- |   |  |                          |                          |                          |
|---|--|--------------------------|--------------------------|--------------------------|
| d | Insurance for the use or operation of manned or unmanned aircraft  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Coverage limits:   |                          |                          |                          |
| e | Property insurance   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Coverage limits:   |                          |                          |                          |
| f | Railroad protective liability insurance  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Coverage limits:   |                          |                          |                          |
| g | Asbestos abatement liability insurance   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Coverage limits:   |                          |                          |                          |
| h | Insurance for physical damage to property while it is in storage and in transit to the construction site | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | Coverage limits:   |                          |                          |                          |
| i | Other:   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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*(Authorized Representative)*

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*(Date of Issue)*



**SECTION 00 7200  
A232 GENERAL CONDITIONS COVER (CMA)**

**SUMMARY**

- 1.01 THE FOLLOWING ARE THE “GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER – ADVISOR EDITION”. AIA DOCUMENT A232-2009, IS BOUND WITH THIS SECTION. AIA DOCUMENT A232-2009 SETS FORTH THE RIGHTS, RESPONSIBILITIES, AND RELATIONSHIPS OF THE OWNER, CONTRACTOR, ARCHITECT AND CONSTRUCTION MANAGER.**

A.

**END OF SECTION**



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# **AIA® Document A232™ – 2019**

## **General Conditions of the Contract for Construction, Construction Manager as Adviser Edition**

### **for the following PROJECT:**

*(Name, and location or address)*

2020 Capital Improvement Project  
Phase 1B: Building Improvements

Early Learning Center  
372 Church Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-008-022

Clinton Elementary School  
100 Montgomery Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-004-014

Columbus School  
18 South Perry Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-001-014

Krieger Elementary School  
265 Hooker Avenue  
Poughkeepsie, NY 12603  
SED # 13-15-00-01-0-006-014

Morse Elementary School  
101 Mansion Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-002-014

Warring Elementary School  
283 Mansion Street  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-005-013

Poughkeepsie Middle School  
55 College Avenue  
Poughkeepsie, NY 12601  
SED # 13-15-00-01-0-015-021

Poughkeepsie High School  
70 Forbus Street  
Poughkeepsie, NY 12603  
SED # 13-15-00-01-0-007-018

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

### **THE CONSTRUCTION MANAGER:**

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User Notes: (1265390648)

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*(Name, legal status, and address)*

**THE OWNER:**

*(Name, legal status, and address)*

Poughkeepsie City School District  
18 South Perry Street  
Poughkeepsie, NY 12601

**THE ARCHITECT:**

*(Name, legal status, and address)*

CPL  
50 Front Street, Suite 202  
Newburgh, NY 12550

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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

**§ 1.1.1 The Contract Documents.** The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of addenda relating to bidding or proposal requirements.

**§ 1.1.2 The Contract.** The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

**§ 1.1.3 The Work.** The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

**§ 1.1.4 The Project.** The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

**§ 1.1.5 Contractors.** Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

**§ 1.1.6 Separate Contractors.** Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

**§ 1.1.7 The Drawings.** The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

**§ 1.1.8 The Specifications.** The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

The Specifications may describe (or the Drawings may show) the general placement required of materials or equipment, but the actual required placement may vary depending on the specific material or equipment used by the Contractor or the existing field conditions. The Contractor shall bear all direct and indirect costs associated with such variations.

Some Specifications may be written in a condensed outline form and omitted words shall be included by interference. If the Specifications identify a task, it shall mean the "Contractor shall furnish, install and complete" the identified task unless otherwise stated.



Reference to standard specifications, manuals or codes shall mean reference to the latest standard specification, manual or code in effect at the time of the execution of the Owner-Contractor Agreement, unless otherwise stated. When reference is made to a manufacturer, trade association, reference standard or similar source (such as ASTM, ASA, AISC, ACI, etc.) the standards or requirements of such entity shall be incorporated into the Specifications and have the force and effect as though they were set forth expressly. Upon entering into the Owner-Contractor Agreement, the Contractor acknowledges its familiarity with those references, codes, etc. The date of the referenced standard shall be the latest edition in effect at the time of the execution of the Owner-Contractor Agreement unless otherwise stated.

**§ 1.1.9 Instruments of Service.** Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

**§ 1.1.10 Initial Decision Maker.** The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

## **§ 1.2 Correlation and Intent of the Contract Documents**

**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complimentary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. In the event of inconsistencies within or between parts of the Contract Documents, the Contractor shall (1) provide a better quality of Work or (2) comply with the more stringent requirements; either or both in accordance with the Architect's interpretation. The terms and conditions of the Subparagraph 1.2.1, however shall not relieve the Contractor of any of the obligations set forth elsewhere in this Agreement. All work shall conform to the Contract Documents. No significant change therefrom shall be made without prior written authorization by the Owner. Where only part of the Work is indicated, similar parts shall be considered repetition. When any detail is shown and the components therefore are fully described, similar details shall be construed and not mentioned in the other shall be of like effect as if shown or mentioned in both. Should the Specifications and Drawings fail to particularly describe a product or material shown to be used in any place, the Contractor shall furnish the product that would normally be used in that place.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

## **§ 1.3 Capitalization**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

## **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.



## **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

## **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

## **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

## **§ 1.8 Building Information Models Use and Reliance**

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

## **ARTICLE 2 OWNER**

### **§ 2.1 General**

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

### **§ 2.2 Evidence of the Owner's Financial Arrangements**

**§ 2.2.1** Prior to commencement of the Work, and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such

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evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

*(Paragraph deleted)*

### § 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 2.3.5 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.6 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

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#### **§ 2.4 Owner's Right to Stop the Work**

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

#### **§ 2.5 Owner's Right to Carry Out the Work**

**§ 2.5.1** If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect, and the Construction Manager or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

**§ 2.5.2** The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner or Contractor (1) granted in the Contract Documents; (2) law; or (3) in equity.

**§ 2.5.3** In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work. The Owner assumes no responsibility for liability for the safety of the Project site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work; provided that the Owner shall be responsible for, and the Contractor shall upon discovery notify the Owner of, any unsafe condition created by the Owner.

### **ARTICLE 3 CONTRACTOR**

#### **§ 3.1 General**

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

**§ 3.1.2** The Contractor shall perform the Work in accordance with the Contract Documents.

**§ 3.1.3** The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

#### **§ 3.2 Review of Contract Documents and Field Conditions by Contractor**

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

The Contractor shall rely on its own knowledge and its review and interpretation of the Contract Documents and data provided in entering into the Contract and not the representations of the Owner or other persons. The Contractor acknowledges that quantities provided in the Contract Documents are estimates only and Contractor shall not seek additional compensation or adjustment in price based on a variation in actual quantities.

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Prior to execution of the Contract, the Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, and (iv) availability and cost of materials, tools, and equipment.

The location of existing features shown on plans is intended for general information only. The Contractor, alone, is responsible for accurate determination of the location of all structures and shall not be entitled to any extra payment for discrepancies between the work as shown in the Contract Documents and existing conditions.

The locations, depths and data as to underground conditions have been obtained from records, surface indications and data furnished by others. Information furnished is solely for the convenience of the Contractor without any warranty, expressed or implied as to its accuracy or completeness. The Contractor shall verify all existing conditions prior to commencing the Work. The Contractor shall make no claim against the Owner or Architect with respect to the accuracy or completeness of such information if the conditions found after commencement of the Work are different from those as indicated.

The Contractor shall be solely responsible for the conditions which develop during construction and in the event any structure is dislocated, or over strained, or damaged so as to affect its usefulness, the Contractor shall correct or repair any dislocations, over strains or damages caused.

The Contractor is responsible for restorations and/or repair of utilities, private property, buildings, pavement, walkways, roads, etc. damaged by its activities during the performance of its Work.

**§ 3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

The Contractor shall assume full responsibility for accuracy of measurements obtained at the site. No extra compensation will be allowed because of differences between actual measurements and dimensions indicated on the Drawings, nor for Contractor's failure to coordinate work with actual field measurements.

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

**§ 3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.



### **§ 3.3 Supervision and Construction Procedures**

**§ 3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner, the Construction Manager, and the Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

### **§ 3.4 Labor and Materials**

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

**§ 3.4.2** Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

After the Contract has been executed, the Owner and Architect will consider requests for the substitution of products in place of those specified only if the Contractor satisfies the procedural requirements set forth in the General Requirements (Division 01) of the Specifications. By making requests for substitutions, the Contractor.

1. Represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
2. Represents that it will provide the same warranty for the substitution as it would have provided for the product specified;
3. Certifies that the cost data presented is complete and includes all related costs for the substituted product and for Work that must be changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that may subsequently be incurred by the Contractor; and
4. Shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

**§ 3.4.2.1** The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed upon changes in the Drawings and Specifications resulting from such substitutions. The Owner may seek reimbursement pursuant to the procedures set forth in § 9.5.1.

**§ 3.4.2.2** The Contractor shall bear all expenses resulting from substitutions including the cost General Conditions as well as any structural, plumbing, mechanical and electrical trade costs made necessary by the substitution.



§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### § 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### § 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### § 3.6 Taxes

§ 3.6.1 Owner is exempt from payment of New York State, and Local Sales and Compensation Use Taxes on all supplies and materials incorporated into and becoming an integral component part of the structures, buildings, or real property pursuant to this Contract. Such taxes are therefore not to be included in the Contractor's bid or Contract Sum. Owner shall deliver to Contractor the appropriate exemption certificate required to be supplied by the Owner, and Contractor and its Subcontractors and materialmen shall be solely responsible for obtaining and delivering any and all exemption or other certificates and for furnishing a Contractor Exempt Purchase Certificate or other appropriate certificates to all persons, firms, or corporations from whom they purchase supplies, materials, and equipment for the performance of the Work.

### § 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

- 1 The Contractor shall promptly deliver copies of such documents to the Owner.
- 2 If in connection with the Project, the Owner has obtained certain permits, licenses or agreements for the Project, the Owner will furnish copies of these documents to the Contractor. It is the Contractor's responsibility to comply with any conditions or limitations placed on the Project by these permits. The Contractor shall fully cooperate with the Owner in meeting the permit requirements and accommodations of regulatory inspections / directives.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor fails to give such notices as applicable to the performance of the Work, the Contractor shall be liable for and shall indemnify and hold harmless the Owner against any and all resulting fines, penalties, judgments or damages, including reasonable attorney fees, imposed on or incurred by the parties indemnified, as a result of such failures by the Contractor.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

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**§ 3.7.4 Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect and Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may submit a Claim as provided in Article 15.

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

**§ 3.7.6** Upon completion of the Work, the Contractor shall deliver to the Architect original copies of all required final certificates of inspection, the Certificate of Occupancy, the other documents evidencing that inspections required by authorities having jurisdiction over the Work have been performed.

### **§ 3.8 Allowances**

**§ 3.8.1** The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

**§ 3.8.2** Unless otherwise provided in the Contract Documents:

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

**§ 3.8.3** Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### **§ 3.9 Superintendent**

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

The Contractor's superintendent shall not be removed from this Project until the Project punch list has been completed and the Project has been accepted by the Owner. Unless approved otherwise by the Owner in advance, the Contractor's superintendent shall be assigned solely to this Project and shall not perform any duties or superintendence on any other Project until completion of this Project.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. Within 14 days of

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receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager, or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### § 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.1.1 In the event that any updated Construction Schedule indicates a projected Substantial Completion date that is more than thirty (30) days after the required Substantial Completion date (as the same may be extended by the Change Order for Excusable Delay), the Owner shall have the right to direct the contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, facilities, (3) rescheduling activities, and (4) other similar measures (hereinafter referred to collectively as "Recovery Measures"). Such Recovery Measures shall continue until the progress of the Work complies with the state of completion required by the Construction Schedule. The Owner's right to require Recover Measures is solely for the purpose of ensuring the Contractor's compliance with the Construction Schedule.

- .1 The Contractor shall not be entitled to see an adjustment in the Contract Sum in connection with Recovery Measures required by the Owner, unless they are incurred by the Contractor as directed in writing by the Owner to mitigate or offset an Excusable Delay.
- .2 The Owner may exercise the rights furnished to the Owner under or pursuant to this Subparagraph 3.10.1.1 as frequently as is reasonably necessary to ensure that the Contractor's performance of the Work will comply with any milestone date or completion date set forth in the Construction Schedule.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and

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similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, and Owner, and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

**§ 3.12 Shop Drawings, Product Data, and Samples**

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Construction Manager and Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities



for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

**§ 3.12.10.2** If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

### **§ 3.13 Use of Site**

**§ 3.13.1** The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

- .1 Due to the site constraints, only materials and equipment that are to be used in the Work shall be brought to and stored on the Project site by the Contractor. After materials and equipment are no longer required for the Work, they shall be promptly removed from the Project site. Protection of materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and adjacent areas.
- .2 The Contractor shall not permit any workers to use existing facilities at the Project site, including, without limitation, lavatories, entrances and parking areas other than those designated and approved by the Owner.
- .3 The Contractor shall comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives, or require compliance with the existing requirements of the rules and regulations.

**§ 3.13.2** The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

### **§ 3.14 Cutting and Patching**

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner,

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Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

**§ 3.14.3** All cutting and patching work shall be done by the Contractor (or through the appropriate Subcontractor). Patches in finish surfaces shall match the adjacent surfaces in material, finish, detail, and quality. Patches in fire rated construction or construction required to be smoke tight shall be made in conformance with assemblies designed and tested by agencies recognized by governing codes. Any UL rated fire-safing materials, flanges, or other materials required by Code, the Contract Documents, or manufacturer's installation instructions for devices penetrating the work affected shall be applied and installed by an approved firestop subcontractor or qualified personnel from the applicable trade.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

### **§ 3.16 Access to Work**

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located.

### **§ 3.17 Royalties, Patents and Copyrights**

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect through the Construction Manager.

### **§ 3.18 Indemnification**

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.



## ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

### § 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

§ 4.1.3 Duties, responsibilities, and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Construction Manager, Architect, and Contractor. Consent shall not be unreasonably withheld.

### § 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor to maintain the Project Schedule or for defects and deficiencies in the Work. The Owner may see reimbursement pursuant to the procedures set forth in § 9.5.1.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 Communications. The Owner shall communicate with the Contractor and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Construction Manager otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager. Communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.



§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

§ 4.2.17 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.18 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.2.20 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

§ 4.2.22 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

- .1 The Contractor's request for information shall be prepared and submitted in accordance with the General Requirements (Division 01 of the Specifications) on the form included therein or as otherwise approved in advance. The Architect will return requests for information that do not conform to requirements of the Contract Documents.
- .2 The Architect's response to a request for information (RFI), or issuance of a clarification or interpretation shall be considered an interpretation, clarification, supplemental information or an order for a minor change in the Work not involving an adjustment in Contract Sum or extension of Contract Time and not inconsistent with the intent of the Contract Documents, and shall be binding, unless indicated otherwise in the Architect's response to the RFI.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.

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**§ 5.1.2** A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

## **§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work**

**§ 5.2.1** Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Construction Manager, for review by the Owner, Construction Manager and Architect, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor whether the Owner, the Construction Manager or the Architect (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

The listing required by this Section shall be submitted to the Architect no later than 30 days from the date of the Agreement. This list shall include the names of manufacturers, suppliers, and installers proposed for each of the products, equipment, and materials to be incorporated into the Project.

The Contractor shall furnish upon request adequate data on any named entity on the list in order to permit the Architect and the Owner to conduct a proper evaluation. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents and all products furnished by the listed manufacturer must conform to such requirements.

**§ 5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

**§ 5.2.3** If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

**§ 5.2.4** The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

## **§ 5.3 Subcontractual Relations**

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

## **§ 5.4 Contingent Assignment of Subcontracts**

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

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- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract, provided that the Owner shall not be under any obligation to compensate the Subcontractor with respect to amounts that the Owner has already paid to the Contractor for such Subcontractor's work.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

## **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

### **§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts**

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

### **§ 6.2 Mutual Responsibility**

§ 6.2.1 The Contractor shall afford the Owner's own forces, Separate Contractors, Construction Manager and other Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces, Separate Contractors, or other Contractors.



§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### § 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor. A Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### § 7.2 Change Orders

A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect, and Contractor, stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.1 Unless otherwise agreed to in writing by the Owner and the Contractor, the combined overhead and profit that shall be included in the total cost (or credit) to the Owner for a Change in the Work shall be based on the following schedule:

- .1 For the Contractor, for Work performed by the Contractor's own forces:
  - a. 15% on the first \$25,000 of the change order direct cost of self-performed work,
  - b. 10% on the portion of the change order direct cost of self-performed work between \$25,000 and \$50,000 and
  - c. 7.5% on the portion of the change order direct cost of self-performed work between \$50,000 and \$200,000 and
  - d. 5% on the portion of the change order direct cost of self-performed work greater than \$200,000.
- .2 For the Contractor, for Work performed by the Contractor's Subcontractor five percent (5%) of the amount due the Subcontractor,
- .3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost,
- .4 For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor,
- .5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7 and shall be itemized (including labor costs).

§ 7.2.2 A Change Order, when issued, shall be full compensation, or credit, for the extra Work performed, omitted, or substituted. It shall show on its face, any adjustment in time for completion of the Project as a result of the Change in



the Work. Each Change Order shall include all costs related thereto, including all overhead, miscellaneous expenses, and incidentals.

### **§ 7.3 Construction Change Directives**

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

**§ 7.3.4** If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

**§ 7.3.5** If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

**§ 7.3.6** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**§ 7.3.7** A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**§ 7.3.8** The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured in accordance with Section 7.1.4.



§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

### ARTICLE 8 TIME

#### § 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

#### § 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

#### § 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, or an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the Architect determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

In the event that the Owner, the Contractor or the Architect is delayed or hindered in or prevented from the performance of any act required by the Contract Documents by reason of a labor dispute, fire, failure of power, unusual delay in deliveries, adverse weather conditions not reasonably anticipatable, unavoidable casualties or other



causes of a like nature beyond the Owner's, the Contractor's or the Architect's control, the Contractor (or its Subcontractors) shall not be entitled to any additional compensation.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15; however, the Contractor's Claims, if any, for any increase in Contract Time must be made in accordance with the time requirements of this Section. Claims for an increase in Contract Time must be made in writing to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims must be initiated within seven (7) days after the Contractor has notice of the delay (initial notice). Thereafter, the Contractor must provide full details and support documentation with regard to the cause of the delay within twenty-one (21) days of the initial notice of the delay. If either the initial notice or the supporting documentation is not submitted to the Initial Decision Maker with a copy to the Architect, if the Architect is not the Initial Decision Maker, in writing within the time periods prescribed in this Section, the Claim for an increase in Contract Time shall be waived. If the cause for the delay is a continuing one, then only one Claim is necessary. The Contractor's supporting documentation to the Initial Decision Maker and/or Architect shall include an estimate of cost, if any, and of the probable effect of the delay on the progress of the Work and the Project Schedule.

**§ 8.3.3** Unless expressly provided otherwise in the Contract Documents, an extension of the Contract Time, to the extent permitted under Subparagraph 8.3.1 shall be the sole remedy of the Contractor for any (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity, or (4) other similar claims (collectively referred to in this Subparagraph 8.3.3 as "Delays") whether or not such Delays are foreseeable unless a Delay is caused by acts of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner (an "Owner-Caused Delay"), in which case the Contractor shall also be entitled to an equitable adjustment of the Contract Sum provided that the Contractor provides to the Owner written notice of such Owner-Caused Delay within ten (10) days of the occurrence of the event giving rise to such Owner-Caused Delay or within ten (10) days after the Contractor first recognizes the condition giving rise to such Owner-Caused Delay, whichever is later.

## **ARTICLE 9 PAYMENTS AND COMPLETION**

### **§ 9.1 Contract Sum**

**§ 9.1.1** The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

**§ 9.1.2** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### **§ 9.2 Schedule of Values**

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Construction Manager, before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Construction Manager and the Architect. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Construction Manager shall forward to the Architect the Contractor's schedule of values. Any changes to the schedule of values shall be submitted to the Construction Manager and supported by such data to substantiate its accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

**§ 9.2.1** The Contractor and each Subcontractor shall prepare a trade payment breakdown for the work for which it is responsible, such breakdown being submitted on a uniform standardized form reasonably approved by the Architect and Owner (AIA G703). The form shall be divided in detail sufficient to exhibit area, floors, and/or sections of the Work, and/or by convenient units and shall be updated as required by either the Owner or the Architect as necessary to reflect (1) description of Work (listing labor and material separately), (2) total value, (3) percent of the Work completed to date, (4) value of the work completed to date, (5) percent of previous amount billed, (6) previous amount billed, (7) current percent completed, and (8) value of Work completed to date. Any trade breakdown that unreasonably fails to include sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (including of normal retainage) to complete the Work.

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### **§ 9.3 Applications for Payment**

**§ 9.3.1** At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

The form Application for Payment, duly notarized, shall be the most recent authorized edition of AIA Document G702, Application and Certificate for Payment, supported by the most recent authorized edition of AIA Document G703, Continuation Sheet.

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.1.3** Each Application for Payment shall be submitted electronically and in four (4) hard copies and shall be accompanied by the following, in all form and substance reasonably satisfactory to the Owner, (1) a current conditional Contractor's waiver of claims and liens, and duly executed an acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material supplier in the requested progress payment, and the amount to be paid to the Contractor from such progress payment together with similar sworn statements from all such subcontractors and material suppliers; (2) duly executed unconditional waivers of claims and liens from all Subcontractors and, when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect or required by the Owner's title insurer.

**§ 9.3.1.4** Unless otherwise agreed to in writing, until Substantial Completion, the Owner shall pay the Contractor [ CHOOSE ONE: ninety percent (90%) OR ninety-five (95%) OR as otherwise agreed to] of the amount due the Contractor.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. Such payment by the Owner for materials, equipment, fixtures and supplies stored on or off the Site shall not relieve the Contractor of its responsibility to provide reasonable protection of said materials, equipment, fixtures and supplies until their incorporation into the Work.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials and equipment relating to the Work.

**§ 9.3.3.1** The Contractor further expressly undertakes to defend the Owner, against any actions, lawsuits, or proceedings brought against the Owner as a result of liens related to the Work unless the reason for the lien is the

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nonpayment by the Owner to the Contractor in accordance with the Contract Documents (referred to as "liens" in this Subparagraph). The Contractor hereby agrees to indemnify and hold the Owner harmless against any such liens or claims of liens and agrees to pay any final judgement or lien if the reason for the judgement or lien is the nonpayment by the Owner to Contractor in accordance with the Contract Documents.

**§ 9.3.3.2** The Owner shall release any payments withheld due to lien or claim of lien if the Contractor obtains security acceptable to the Owner or a lien discharge bond that is (1) issued by a surety acceptable to the Owner; (2) in form and substance satisfactory to the Owner, and (3) in an amount required by law to release such lien claim. By posting a lien discharge bond or other acceptable security, however, the Contractor shall not be relieved of any responsibilities or obligations under Subparagraph 9.3.3.1 including without limitation, the duty to defend and indemnify the Owner. The cost of any premiums incurred in connection with such bonds and security shall be the responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.

#### **§ 9.4 Certificates for Payment**

**§ 9.4.1** Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

**§ 9.4.2** Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

**§ 9.4.2.1** Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

**§ 9.4.3** The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

**§ 9.4.4** The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

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§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

#### § 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.2. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor or other Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.
- .8 any other reasonable grounds for objection or withholding as provided in the agreement or as permitted by law.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The Owner shall not be deemed in default by reason of withholding payment while any conditions described in 9.5.1 remain.

§ 9.5.3 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

*(Paragraph deleted)*

#### § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the



Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

**§ 9.6.2.1** The Contractor shall indemnify and hold the Owner harmless from laborers, mechanics and materialmen liens upon the Owner's properties or the premises upon which the work is located, arising out of the work performed or materials furnished by the Contractor or any of its Subcontractors or any material suppliers under the Contract.

**§ 9.6.3** The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

**§ 9.6.4** The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

**§ 9.6.5** The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

**§ 9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

**§ 9.6.7** Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

**§ 9.6.8** Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

## **§ 9.7 Failure of Payment**

If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

## **§ 9.8 Substantial Completion**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed



or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**§ 9.8.3** Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.

- .1 The Architect will perform no more than two (2) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections pursuant to Section 9.5.1

**§ 9.8.4** When the Architect, assisted by the Construction Manager, determines that the Work of all of the Contractors, or designated portion thereof, is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute, a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

#### **§ 9.9 Partial Occupancy or Use**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

#### **§ 9.10 Final Completion and Final Payment**

**§ 9.10.1** Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices



and Application for Payment or Project Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.1.1** The Architect will perform no more than two (2) inspections whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections. The Owner may seek reimbursement pursuant to Section 9.5.1.

**§ 9.10.1.2** The final payment of retained amount due the Contractor on account of the Contract shall not become due until the Contractor has furnished the Owner, through the Architect, completion documents as enumerated below, or as otherwise required in the Contract Documents.

- .1 One (1) hard copy and one (1) electronic Record Set of Drawings showing actual construction of all portions of the Work and incorporating all changes and amendments thereto, as redlined against the 100% Construction Drawings.
- .2 Guarantees and Warranties required by specific Sections of the Specifications.
- .3 Release and Waiver of Claims, conditioned upon Final Payment, by the General Contractor, Subcontractors, Sub-subcontractors and material suppliers.
- .4 All mechanical and electrical installation, operating and maintenance manuals called for under the Specifications.
- .5 All test reports and certifications required under the mechanical and electrical specifications.
- .6 All forms required to be completed by the Contractor by regulatory governmental agencies with two copies delivered to the Architect.
- .7 Shop Drawing submittals in accordance with Article 3.
- .8 A copy of the unconditional Occupancy Permit or Certificate of Compliance issued by the local Building Inspection Department having Jurisdiction, unless such is not issued for any reason that is not the responsibility of the Contractor under the Contract Documents or is caused by circumstances beyond the Contractor's control.
- .9 Manufacturer's current detailed installation instructions for fire dampers, ceiling radiation dampers, smoke dampers, and duct smoke detectors as applicable to the Project.
- .10 One (1) copy of the equipment operational and maintenance manuals.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and



Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

### § 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and
- .4 construction or operations by the Owner, Separate Contractors, or other Contractors.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or



Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

**§ 10.2.8 Injury or Damage to Person or Property**

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

**§ 10.3 Hazardous Materials**

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner, Construction Manager and Architect of the condition.

**§ 10.3.2** Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the



Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

#### **§ 10.4 Emergencies**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

### **ARTICLE 11 INSURANCE AND BONDS**

#### **§ 11.1 Contractor's Insurance and Bonds**

**§ 11.1.1** The Contractor shall purchase and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below (and such insurance shall be from a company that is A rated or better by A.M. Best Company) which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed.
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employee;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death or a person or property damage arising out of ownership, maintenance or use of a motor vehicle.
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

**§ 11.1.2** The Insurance required by Section 11.1.1 or as described in the Agreement or other corresponding Exhibit setting forth the specific insurance requirements shall be written for not less than limits of liability specified by the Owner or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

**§ 11.1.3** Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within not less than twenty (20) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have



the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.1.5 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

#### § 11.1.6 INSURANCE REQUIREMENTS

INSERT HERE OR IN OWNER-CONTRACTOR AGREEMENT.

#### § 11.1.7 PERFORMANCE BOND AND PAYMENT BOND

IF BOND INFORMATION IS TO BE FOUND ELSEWHERE (OWNER-CONTRACTOR AGREEMENT OR INSTRUCTIONS TO BIDDERS), OR NOT REQUIRED – MODIFY THIS SECTION

§ 11.1.7.1 The Contractor shall furnish a Performance Bond and Labor and Material Payment Bond meeting all statutory requirements of the jurisdiction where the Project is located, in form and substance satisfactory to the Owner and, without limitation, complying with the following specific requirements:

- .1 Except as otherwise required by statute, the form and substance of such bonds shall be satisfactory to the Owner in the Owner's sole judgment.
- .2 Bonds shall be executed by a responsible surety licensed in the jurisdiction where the Project is located, with a Best's rating of no less than A/XII, and shall remain in effect for a period not less than two (2) years following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer.
- .3 The Performance Bond and the Labor and Material Payment Bond shall each be in an amount equal to the Contract Sum and all subsequent increases.
- .4 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power-of-attorney indicating the monetary limit of such power.
- .5 Every Bond under this Subparagraph 11.4.1 must display the Surety's Bond Number. A rider including the following provisions shall be attached to each Bond:
  - (i) The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change or other modification of the Contract Documents. Any addition, alteration, change, extension of time, or other modification of the Contract Document, or a forbearance on the part of either the Owner or the Contractor to the other, shall not release the Surety of its obligations hereunder, and notice to the Surety of such matters is hereby waived.
  - (ii) The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the Owner.
- .6 Bonds shall be written on AIA Document 312.
- .7 If the Surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 11.4.1, Contractor shall within ten (10) days thereafter substitute another Bond and Surety, both of which must be acceptable to the Owner.

#### § 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors,

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and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice directly to the Contractor, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

#### **§ 11.3 Waivers of Subrogation**

**§ 11.3.1** The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

**§ 11.3.2** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

#### **§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance**

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor, Architect, and Construction Manager for loss of use of the Owner's property, due to fire or other hazards however caused.

#### **§ 11.5 Adjustment and Settlement of Insured Loss**

**§ 11.5.1** A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate



agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

**§ 11.5.2** Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

## **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

### **§ 12.1 Uncovering of Work**

**§ 12.1.1** If a portion of the Work is covered contrary to the Construction Manager's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by either, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Construction Manager or Architect has not specifically requested to examine prior to its being covered, the Construction Manager or Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

### **§ 12.2 Correction of Work**

#### **§ 12.2.1 Before Substantial Completion**

The Contractor shall promptly correct Work rejected by the Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion, and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

#### **§ 12.2.2 After Substantial Completion**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.



§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### § 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.1.1 In all operations under the Contract, the Contractor agrees that it will comply with provisions of all State and Federal Laws (including OSHA) and all local ordinances which may affect such operations.

### § 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

### § 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Construction Manager, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become



requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

#### § 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

### ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

#### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.



§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

**§ 14.2 Termination by the Owner for Cause**

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, after consultation with the Construction Manager, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

**§ 14.3 Suspension by the Owner for Convenience**

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and the Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of this Contract.

**§ 14.4 Termination by the Owner for Convenience**

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and



- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

§ 14.4.4 The Contractor shall include in each of its subcontracts a clause, similar in effect to the provisions in Paragraph 14.4, allowing the Contractor to terminate the subcontract for its sole convenience, subject only to the payment obligations set forth in Paragraph 14.4.3.

## ARTICLE 15 CLAIMS AND DISPUTES

### § 15.1 Claims

§ 15.1.1 **Definition.** A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

### § 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

### § 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

### § 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 **Claims for Additional Cost.** If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

### § 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on

Init.



progress of the Work. In the case of a continuing delay only one Claim is necessary. The Contractor shall accompany the Claim with a written analysis with a proposed revision to the Schedule illustrating the claimed influence of the basis for delay on the critical path of the Work and the applicable deadlines that may be impacted. Contractor will exercise reasonable efforts to mitigate the potential impact of any delay but shall be compensated for any costs associated therewith.

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The time for performance of this Contract, as set forth in the Construction Schedule, shall include an allowance for delays due to reasonably anticipated adverse weather for the area where the Work is located. For the purpose of establishing that abnormal adverse weather conditions have caused a delay, and determining the extent of delay attributed to such weather conditions, the Contractor shall furnish with its claim, National Oceanic and Atmospheric Administration (NOAA) National Weather Service records of climatic conditions during the same time interval for the previous five (5) years for the locality of the Work; the Contractor's daily job site logs/daily construction reports showing weather, job activities, and the effect of weather on the progress of the Work; and an impact schedule showing the effects of the weather event on the critical path of the Contractor's Construction Schedule. Time extension for weather delays and related impact do not entitle the Contractor to extended overhead recovery or to any other monetary compensation associated with that claim unless approved in writing by the Owner.

**§ 15.1.6.3** The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which have concurrent or interrelated effects on the progress of the Work.

**§ 15.1.7 Waiver of Claims for Consequential Damages.** The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

## **§ 15.2 Initial Decision**

**§ 15.2.1** Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

**§ 15.2.2** The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

**§ 15.2.3** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision



Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties, the Construction Manager, and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days of receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.



**§ 15.4 Arbitration – DELETE ALL OF 15.4 IF ARBITRATION NOT SELECTED IN OWNER-CONTRACTOR AGREEMENT**

**§ 15.4.1** If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

**§ 15.4.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

**§ 15.4.2** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

**§ 15.4.3** The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**§ 15.4.4 Consolidation or Joinder**

**§ 15.4.4.1** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 15.4.4.2** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.







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**SECTION 00 7250  
INSURANCE REQUIREMENTS – CONTRACTOR****PART 1**

**1.01 NOTWITHSTANDING ANY TERMS, CONDITIONS OR PROVISIONS, IN ANY OTHER WRITING BETWEEN THE PARTIES, THE CONTRACTOR HEREBY AGREES TO EFFECTUATE THE NAMING OF THE POUGHKEEPSIE CITY SCHOOL DISTRICT (DISTRICT / OWNER), CPL (ARCHITECT/ENGINEER), AND TRITON CONSTRUCTION COMPANY (CONSTRUCTION MANAGER) AS ADDITIONAL INSURED(S) ON THE CONTRACTOR'S INSURANCE POLICIES, EXCEPT FOR WORKERS' COMPENSATION AND N.Y. STATE DISABILITY INSURANCE.**

**1.02 THE POLICY NAMING ADDITIONAL INSURED(S) SHALL:**

- A. Be an insurance policy from an A.M. Best A- rated or better insurer, licensed to conduct business in New York State.
- B. State that the organization's coverage shall be primary and non-contributory coverage for the District, its Board, employees and volunteers, Construction Manager, and Architect, with a waiver of subrogation in favor of the District..
- C. Additional insured status shall be provided by standard or other endorsements that extend coverage to the District, Construction Manager, and Architect for on-going operations (CG 20 38) and products and completed operations (CG 20 37). The decision to accept an endorsement rests solely with the District, and its consultants. A completed copy of the endorsements must be attached to the Certificate of Insurance.
- D. All insurance policies maintained by the Contractor shall include a waiver of any and all rights of subrogation of the Contractor or its insurers against the Owner, Construction Manager, and Architect, along with all other Additional Insureds / Indemnified Parties and their agents, officers, directors and employees for recovery of damages. Contractor further waives its rights of subrogation against the Owner or any Additional Insureds or Indemnified Party for any damage or loss to the Contractor's scope of work, tools, equipment, materials or any other loss within the scope of any insurance maintained by the Owner.

**1.03 CERTIFICATE OF INSURANCE**

- A. The certificate of insurance must describe the services provided by the contractor (e.g., roofing, carpentry or plumbing) that are covered by the liability policies.
- B. The contractor shall provide a copy of the declaration page of the liability and umbrella/excess policies with a list of endorsements and forms. If requested, the contractor shall provide a copy of the policy endorsements and forms.
- C. There will be no coverage restrictions and/or exclusions involving New York State Labor Law statutes or gravity related injuries.
- D. A fully completed New York Construction Certificate of Liability Insurance Addendum (ACORD 855 2014/15) must be included with the certificates of insurance. For any "Yes" answers on Items G through L on this Form– additional details must be provided in writing. Policy exclusions may not be accepted.

**1.04 THE CONTRACTOR AGREES TO INDEMNIFY THE DISTRICT, CONSTRUCTION MANAGER, AND ARCHITECT FOR APPLICABLE DEDUCTIBLES AND SELF-INSURED RETENTIONS.**

**1.05 MINIMUM REQUIRED INSURANCE:**

- A. **Commercial General Liability Insurance**
    - 1. \$1,000,000 per Occurrence/ \$2,000,000 Aggregate
    - 2. \$2,000,000 Products and Completed Operations
    - 3. \$1,000,000 Personal and Advertising Injury
    - 4. \$100,000 Fire Damage
    - 5. \$10,000 Medical Expense
-



6. The general aggregate shall apply on a per-project basis.

**B. Owners Contractors Protective (OCP) Insurance**

1. For projects less than or equal to \$1,000,000 and work on 1 story (10 feet) only; \$1 million per occurrence, \$2 million aggregate with the District as the Named Insured.
2. For projects greater than \$1,000,000 and/or work over 1 story (10 feet); \$2 million per occurrence, \$4 million aggregate with the District as the Named Insured.
3. For all projects where General Liability, Auto and Umbrella/Excess Coverage is with non-licensed and non-admitted carriers in New York State; \$2 million per occurrence, \$4 million aggregate with the District as the named Insured.
4. The District will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

**C. Automobile Liability**

1. \$1,000,000 combined single limit for owned, hired, borrowed and non-owned motor vehicles.

**D. Workers' Compensation and NYS Disability Insurance**

1. Statutory Workers' Compensation (C-105.2 or U-26.3); and NYS Disability Insurance (DB-120.1) for all employees. Proof of coverage must be on the approved specific form, as required by the New York State Workers' Compensation Board. ACORD certificates are not acceptable. A person seeking an exemption must file a CE-200 Form with the state. The form can be completed and submitted directly to the WC Board online.

**E. Builder's Risk**

1. Must be purchased by the contractor to include interest of the Owner and Contractor jointly in a form satisfactory to the Owner. The limit must reflect the total completed value – all material and labor costs and provide coverage for fire, lightning, explosion, extended coverage, vandalism, malicious mischief, windstorm, hail and/or flood.

**F. Umbrella/Excess Insurance**

1. \$5 million each Occurrence and Aggregate for general construction and no work at elevation (1 story - 10 feet) or project values less than or equal to \$1,000,000.
2. \$10 million each Occurrence and Aggregate for high-risk construction, work at elevation (> 1 story or 10 feet) or project values greater than \$1,000,000.
3. Umbrella/Excess coverage shall be on a follow-form basis over the Auto Liability and General Liability coverages.



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- 1.06 CONTRACTOR ACKNOWLEDGES THAT FAILURE TO OBTAIN SUCH INSURANCE ON BEHALF OF THE DISTRICT CONSTITUTES A MATERIAL BREACH OF CONTRACT AND SUBJECTS IT TO LIABILITY FOR DAMAGES, INDEMNIFICATION AND ALL OTHER LEGAL REMEDIES AVAILABLE TO THE DISTRICT. THE CONTRACTOR IS TO PROVIDE THE DISTRICT WITH A CERTIFICATE OF INSURANCE, EVIDENCING THE ABOVE REQUIREMENTS HAVE BEEN MET, PRIOR TO THE COMMENCEMENT OF WORK.**
- 1.07 SUB-CONTRACTORS ARE SUBJECT TO THE SAME TERMS AND CONDITIONS AS STATED ABOVE AND MUST SUBMIT SAME TO THE DISTRICT FOR APPROVAL PRIOR TO START OF ANY WORK.**
- 1.08 IN THE EVENT THE CONTRACTOR FAILS TO OBTAIN THE REQUIRED CERTIFICATES OF INSURANCE FROM THE SUBCONTRACTOR AND A CLAIM IS MADE OR SUFFERED, THE CONTRACTOR SHALL INDEMNIFY, DEFEND, AND HOLD HARMLESS THE DISTRICT, ITS BOARD, EMPLOYEES AND VOLUNTEERS, CONSTRUCTION MANAGER, AND THE ARCHITECT/ENGINEER FROM ANY AND ALL CLAIMS FOR WHICH THE REQUIRED INSURANCE WOULD HAVE PROVIDED COVERAGE. THIS INDEMNITY OBLIGATION IS IN ADDITION TO ANY OTHER INDEMNITY OBLIGATION PROVIDED IN THE CONTRACT.**
- 1.09 ADDITIONAL REQUIREMENTS ASBESTOS, LEAD ABATEMENT AND/OR HAZARDOUS MATERIALS**
- A. Asbestos/Lead Abatement/Pollution Liability Insurance
1. \$2,000,000 per occurrence/\$2,000,000 aggregate, including products and completed operations. Such insurance shall include coverage for the Contractor's operations including, but not limited to, removal, replacement, enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a retroactive date is used, it shall pre-date the inception of the Contract.
  2. If the Contractor is using motor vehicles for transporting hazardous materials, the Contractor shall maintain pollution liability broadened coverage (ISO Endorsement CA 9948), as well as proof of MCS 90. Coverage shall fulfill all requirements of these specifications and shall extend for a period of three (3) years following acceptance by the District of the Certificate of Completion.
- 1.10 TESTING COMPANY ERRORS AND OMISSION INSURANCE**
- A. \$1,000,000 per occurrence/\$2,000,000 aggregate for the testing and other professional acts of the Contractor performed under the Contract with the District.

**END OF SECTION**



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**SECTION 00 7343  
PREVAILING WAGE RATES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Wage rates shall apply as shown in the Prevailing Wage Schedule prepared by the New York State Department of Labor for this project (the Prevailing Wage Case Number (PRC#) assigned to this project is 2021011260). The Schedule can be viewed at the following web site:<https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1522262> .
- B. The Contractor shall be responsible for completing one copy of Notice of Contract Award (Form PW-16). Upon completion of the form, the Contractor shall submit the form to the Architect for record keeping and forwarding to the New York State Department of Labor.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**



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**SECTION 01 1000  
SUMMARY**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Multiple work packages.
  - 4. Access to site.
  - 5. Work restrictions.
  - 6. Coordination with occupants.
  - 7. Phased construction.
  - 8. Work under separate contracts.
  - 9. Work by Owner.
  - 10. Owner-furnished products.
  - 11. Miscellaneous provisions.
  - 12. Specification and drawing conventions.

**1.02 PROJECT INFORMATION**

- A. Project Identification: Phase 1B Building Improvements.
- B. Project Location(s):
  - 1. Poughkeepsie High School, 70 Forbus Street, Poughkeepsie, New York 12601.
  - 2. Poughkeepsie Middle School, 101 Mansion Street, Poughkeepsie, New York 12601.
  - 3. Krieger Elementary School, 372 Church Street, Poughkeepsie, New York 12601.
- C. Owner: Poughkeepsie City School District, 18 S. Perry Street, Poughkeepsie, NY 12601.
  - 1. Owner's Representative: Marcos Rodriguez.
- D. Architect: CPL, 50 Front Street, Suite 202, Newburgh, NY 12550.
- E. Construction Manager: **Triton Construction**.
  - 1. Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and each Contractor, according to a separate contract between Owner and Construction Manager.
- F. Submittal Web Site: The Architect requires the use of Newforma Info Exchange for delivery and return of submittals, shop drawings and requests for information. There are no exceptions to this requirement.

**1.03 DEFINITIONS**

- A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

**1.04 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work of the Project is defined by the Contract Documents and consists of the following:
  - 1. Work consists of toilet and locker room renovations, boiler replacement, roofing replacement, and exterior door and window replacement as described in the Contract Documents.
- B. Type of Contract:
  - 1. Project will be constructed under coordinated, concurrent multiple contracts. See Division 01 Section "Multiple Contract Summary" for a description of work included under each of the multiple contracts and for the responsibilities of the Project coordinator.



### 1.05 ACCESS TO SITE

- A. Use of Site: Limit use of Project site to **work in area(s)** indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Driveways, Walkways and Entrances: Keep driveways (parking garage,) (loading areas,) and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

### 1.06 WORK RESTRICTIONS

- A. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 3:30 p.m, Monday through Friday, except as otherwise indicated.
  - 1. School Vacations and Holidays: Work may occur at any times, as approved.
  - 2. Weekend Hours: Work may occur at any times, as approved.
  - 3. Hours for Utility Shutdowns: Only on weekends, holidays and school vacations as approved.
  - 4. Hours for Noisy Activity: For core drilling, powder-activated fasteners, and other disruptive activities, 3:30 p.m. to 11:00 p.m, or as otherwise approved.
  - 5. Special Events: The Owner will provide dates and times of special events that will restrict construction operations.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Notify **Owner** not less than two days in advance of proposed utility interruptions.
  - 2. Obtain **Owner's** written permission before proceeding with utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify **Owner** not less than two days in advance of proposed disruptive operations.
  - 2. Obtain **Owner's** written permission before proceeding with disruptive operations.
- D. Nonsmoking Building: Smoking is not permitted within the building or **grounds**.

### 1.07 COORDINATION WITH OCCUPANTS

- A. **Full Owner Occupancy:** Owner will occupy site and building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
    - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
    - 2. Notify the Owner not less than 72 hours in advance of activities that will affect Owner's operations.
  - B. **Owner Limited Occupancy** of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
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1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

#### **1.08 WORK UNDER SEPARATE CONTRACTS**

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

#### **1.09 SPECIFICATION AND DRAWING CONVENTIONS**

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
  3. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
  4. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
- B. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  1. Abbreviations: Materials and products are identified by abbreviations (published as part of the U.S. National CAD Standard) (and) scheduled on Drawings.
  2. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

#### **PART 2 PRODUCTS (NOT APPLICABLE)**

#### **PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**



**SECTION 01 1010**  
**SPECIAL PROVISIONS OF THE CONTRACT COVER**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Attached is Section 01 1010 Special Provisions of the Contract.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



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## SPECIAL PROVISIONS

These Special Provisions are in addition to the Plans, Specifications and the other Contract Documents and shall be part of this Agreement between the Owner and the Contractor. All references to "This Prime Contractor", "This Contractor" or "Contractor" refers to the **General Construction Prime Contractor, Plumbing Prime Contractor, Mechanical Prime Contractor, and Electrical Prime Contractor** per each respective building project and associated SED # (**Contracts #3 through #26**). The following provisions shall apply for each individual project and each Prime Contractor associated along with it. In cases of contradictions, the most stringent Provision shall govern.

### General Requirements for Each Prime Contractor

#### I. General

1. All dates, durations, etc. defined herein shall be in business days.
2. Except for the basic building permit, each Prime Contractor's price shall include all fees and other costs for securing and maintaining (by the Prime Contractors or their subcontractors) for the life of the job; all permits, PE licenses, connection fees, inspections, etc., applicable to, or customarily secured for the Work. This provision includes any applications and/or permits to be issued by utility companies in the name of the Prime Contractor, or the Owner, as required for the Work. Originals of all permits are to be issued in the name of the Prime Contractor as required for the Work. Each Prime Contractor shall furnish the Construction Manager with original copies of all permits prior to the commencement of the Work, and, shall prominently display a copy of all permits at a location agreed to with the Construction Manager.
3. One week prior to the start of physical work, each Prime Contractor shall provide two copies of a video taped recording of all existing conditions to the Construction Manager. This taping shall provide a record of all-existing buildings, grounds, exterior conditions and interior conditions. The Contractor shall schedule a representative of both the Owner and the Construction Manager to be present at this taping. In the absence of this record, each Prime Contractor shall be responsible for paying the costs associated with any and all repairs or replacements of existing materials and/ or conditions that were damaged in an area where the Prime Contractor is working or has worked, as may be deemed necessary by the Owner or the Construction Manager.
4. Each Prime Contractor is responsible for providing the required mock-ups defined by the Contract Documents out of sequence as needed by the Architect.
5. Each Prime Contractor is responsible for providing all required Engineered material calculations as defined by the contract documents.
6. Each Prime Contractor shall provide drinking water for his own employees.



7. On Site Communications. Each Prime Contractor shall provide, or otherwise see that, the project manager, or site managers, and/or responsible workers of each Prime Contractor and major subcontractor are equipped with cellular phones for the purpose of staying in contact with for the Construction Manager.
8. Each Prime Contractor shall include in his base price the cost of all rigging and equipment required for the performance and installation of the Work.
9. **Each bidder who is awarded a contract must perform its work in compliance with all applicable CDC, OSHA and New York State protocols related to the COVID-19 pandemic, including social distancing, cleaning and disinfection protocols. Each bidder who is awarded a contract must ensure the individuals and entities retained by it to perform work comply with all applicable CDC, OSHA and New York State protocols related to the COVID-19 pandemic. Each bidder who is awarded a contract will be responsible to ensure the safety of those retained by the individuals and entities retained by it to perform its contract obligations and will be responsible for the means and the methods utilized to perform the Work. Each bidder who is awarded a contract will be required to cooperate with other contractors engaged by the School District/Owner in providing access to construction areas at the Project site while maintaining compliance with all applicable CDC, OSHA and New York State protocols related to the COVID-19 pandemic.**

**Any fines imposed or incurred for violation(s) of the Executive Orders of the Governor of New York State related to the COVID-19 pandemic as well as for violation(s) of all applicable CDC, OSHA and New York State protocols related to the COVID-19 pandemic will be the sole responsibility of the bidder awarded a contract whose conduct caused the violation(s).**

**Each bidder awarded a contract must implement and follow all NYS guidelines and regulations regarding COVID-19. Including but not limited to hand washing/sanitizing stations, disinfecting, social distancing, contact tracing logs, etc... COVID-19 protocols, policy and procedures must be detailed and included in each prime contractor's safety manual and logistics plan and is to be submitted to the Construction Manager. This requirement extends to all subcontractors of each prime contractor.**

**Each bidder awarded a contract will also be required to abide by the School District/ Owner's most recent requirements for COVID protection, which may continue to adjust due to Federal/State and Local government policies. Contractors not willing to abide by the School District/ Owner's requirements will not be able to access the School District/Owner's property to execute their work, and will be neglecting the terms of their contract.**

## **II. Schedule**

1. All Contractors are to recognize that the Project Schedule is of critical importance to the Owner. All aspects of construction must reflect a 'time is of the essence' construction strategy. The attached 'Bid Schedules' serves as a guide of critical milestone dates to the Project. Failure to meet intermediate



milestone dates will jeopardize the overall Project Schedule. This failure will mandate Contractor(s) to, increase staff, work overtime, or use other means to recover time, at the costs of those Contractor(s) responsible for such delays. In addition, all costs due to delays in completion of the Work, which require additional Custodial Overtime, Construction Management services, Architectural services, and Engineering services beyond the Work duration in the Bid Schedule, shall be borne by Contractor(s) responsible for delays.

2. Each contractor, prior to being awarded the contract shall prepare and submit a Preliminary Master Project Schedule for their Work. **Within (3) weeks of NOA (Notice of Award) all Prime Contractors will provide a coordinated Draft master schedule.** Each Prime's Project Schedule are to reflect all requirements for submittals, material and equipment procurement, material stockpiling, setting up Contractor's staging area and surveying of existing conditions. These Schedules, reflecting the critical milestone dates established by the attached 'Bid Schedule', are to be coordinated and shall be inclusive of other Prime Contractor's activity. The "Final" agreed upon overall schedule of work shall be developed and maintained by the Prime Contractor for General Construction in conjunction with the Construction Manager utilizing each Prime Contractor's Preliminary and updated Schedule(s). Specific relationships between Contractors, sequencing of activities, phasing, and critical "ties" of coordinated Work must be detailed on the Project Schedule. All Contractors shall utilize "Sure Track Project Manager 3.0-" as produced by Primavera Systems, Inc., -or- equal platform producing Gant Style Scheduling.
3. All Prime Contractors shall review the completed "Final" detailed construction schedule and acknowledge their acceptance of this schedule by signing a copy to be kept on record by the Construction Manager. This agreed upon schedule must incorporate all milestone dates and shall be established within five (4) weeks of Notice of Award.
4. The Prime Contractor for General Construction shall update the detailed construction schedule with the Construction Manager and issue copies to the other Prime Contractors, the Owner, Construction Manager, and the Architect monthly. Each Prime Contractor shall provide the Prime Contractor for General Construction with all information necessary to provide these updates.
5. Each Prime Contractor is to submit a schedule of projected fabrication on long lead items (items requiring four weeks and over to fabricate) three weeks after Notice of Award. Progress/Status reports on fabrication to be submitted to the Construction Manager every two weeks. 'Rate of Change' chart and marked up shop drawings to be included in these reports.
6. Each Prime Contractor shall be responsible for coordinating and expediting their fabrication and delivery schedules and keeping the Construction Manager informed as to their progress and their anticipated ability to stay on schedule. Should it become necessary (in the opinion of the Construction Manager) to supplement the Prime Contractor's expediting efforts in order to maintain job progress, the Construction Manager may elect to charge all costs incurred to said Prime Contractor.
7. In the event that Owner makes special arrangements to open a building at the request of a Contractor and the Contractor does not show, the Prime Contractor shall pay the Owner all costs incurred. All parties agree that any action taken to enforce this requirement shall not be construed by any Prime



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Contractor or its subcontractors/suppliers, as a reason for a claim (for either time or money) for delay to the Work or to the Prime Contractor, its subcontractors, or suppliers.

8. The Owner shall take partial occupancy of the building's renovated spaces in accordance with the dates established by the Bid Schedule and the Special Provisions. The Contractors shall perform all Work necessary to maintain the Owner's move-in and occupancy schedule.
9. The Contractors shall include in their base price, all out of sequence Work and any Work required to be performed during overtime hours or non-working hours necessary to maintain the Master Schedule, the Prime Contractors' project schedule, or, the Owner's move-in schedule.

### **III. Submittal Milestone Requirements**

#### **Submittal Priorities**

The following submittal dates (in business days) are critical to allow for proper fabrication timeframes to ensure timely completion of the project to meet the attached bid schedule. A complete listing of all submittal requirements is located in "Section 01300 Submissions", which shall be accompanied by each division's specific submittal requirements.

#### **Major General Construction Submittals**

Scaffolding and/or Stair tower-(may require PE Stamp)	15 days from Notice of Award
Bracing/Shoring-(may require PE Stamp)	15 days from Notice of Award
Rebar/Reinforcing Shop Drawings	15 days from Notice of Award
Structural Steel/Decking	15 days from Notice of Award
Masonry Submittals/Shop Drawings	15 days from Notice of Award
Doors/Hardware	15 days from Notice of Award
Toilet Partitions	15 days from Notice of Award
Windows/Openings	15 days from Notice of Award
Interior Finishes	20 days from Notice of Award
Casework	20 days from Notice of Award
<b>All remaining Submittals with-in</b>	<b>20 days from Notice of Award</b>

#### **Major Roofing Construction Submittals**

Roofing/Tapered Shop Drawings	15 days from Notice of Award
Roofing	15 days from Notice of Award
Mechanical Curbs	15 days from Notice of Award
Misc. Structural Steel	15 days from Notice of Award
<b>All remaining Submittal with-in</b>	<b>20 days from Notice of Award</b>

#### **Major Plumbing Equipment**

Plumbing Equipment	15 days from Notice of Award
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Plumbing Fixtures  
**All remaining Submittals with-in**

15 days from Notice of Award  
**20 days from Notice of Award**

**Major HVAC Equipment**

Duct Work  
Equipment  
Controls  
Hot/Chilled Piping and Enclosures  
HVAC Shop Drawings  
**All remaining Submittals with-in**

15 days from Notice of Award  
15 days from Notice of Award  
20 days from Notice of Award  
20 days from Notice of Award  
20 days from Notice of Award  
**20 days from Notice of Award**

**Major Electrical Equipment**

Service Equipment  
Fire Alarm  
Public Address/Intercom  
Light Fixtures  
**All remaining Submittal with-in**

15 days from Notice of Award  
15 days from Notice of Award  
15 days from Notice of Award  
15 days from Notice of Award  
**20 days from Notice of Award**

**IV. Construction Milestones**

**All Prime Contractors:**

Special consideration should be made to the requirements of the project bid schedule attached in the Specifications. Prime Contractors will be required to man each contract to meet the milestone dates indicated below and/or in the contract bid schedule. All costs should be included in the bid for working multiple shifts, nights, weekends, and holidays to complete each phase of the project.

Time frames indicated, show milestone dates required to be met by all Prime Contractors. These areas, once completed, will be punch-listed and given partial occupancy for the Owner to occupy. Occupying these areas is critical to the Owner. If said dates are not met Liquidated damages may be assessed and back-charged to the responsible Contractor.

**KEY MILESTONE DATES:**

**Poughkeepsie High School**

**STUDENT (GROUP) BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**SINGLE USER or FACULTY BATHROOMS – Alternate**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**BOYS & GIRLS LOCKER ROOMS – Alternate**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**



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**EXHAUST FANS, RTUs**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**Poughkeepsie Middle School**

**STUDENT (GROUP) BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**SINGLE USER or FACULTY BATHROOMS – Alternate**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**Warring Elementary School**

**STUDENT (GROUP) BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**SINGLE USER or FACULTY BATHROOMS – Alternate**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**Clinton Elementary School**

**STUDENT (GROUP) BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**SINGLE USER or FACULTY BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**Columbus School**

**STUDENT (GROUP) BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**SINGLE USER or FACULTY BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**Early Learning Center**

**STUDENT (GROUP) BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**

**SINGLE USER or FACULTY BATHROOMS**

- Construction Start: **June 27, 2022** | Substantial Completion: **August 25, 2022**



## **V. Summary Overview**

### **Introduction for All Buildings & Projects**

Each building and it's associated project must have their bathrooms ready for the 2022-23 school year which begins the first week of September. This requires all trades to work multiple shifts to execute the work- as needed. For any materials, equipment or assemblies that may have long lead-times or may not be installed by late August, each trade shall include temporary provisions to install either existing equipment or temporary equipment for the bathrooms to be opened on time. This includes but is not limited to; Doors/Frames/Hardware, Toilet Partitions, Mechanical Equipment, Lighting, Plumbing Fixtures and Accessories. Failure to open the bathrooms can result in liquidated damages for temporary facilities, or the Owner taking on the work themselves and back charging the contractor responsible.

### **Poughkeepsie High School - SED No. 13-15-00-01-0-007-018**

Originally built and opened in 1956, the Poughkeepsie High School can hold upwards to 2000 pupil. In 2002, a new science and math wing was added to the existing building which work involved on this project will only take place during the Summer 2023.

The building has been phased into two separate phases to accommodate summer academics being held within the building. The building will be active with students and faculty requiring special consideration from each contractor for sound, dust and abatement mitigation.

**Bathroom Renovations:** The building will undergo a (10) large-group/student bathroom renovation along with an (11) single/faculty bathroom renovation, during the Summer of 2022. The remainder of bathrooms which will bid as an alternate will be renovated over the Summer 2023. Given the era of the building, there will be an abatement throughout most of the bathrooms, specific to: presumed ACBM pipe-insulation, joint compound, floor tiles, etc., which will be referenced throughout the Abatement Drawings and Environmental Report within the Specifications. The abatement process shall happen immediately **AFTER-HOURS** once school has dismissed for summer recess and in a means that is guided by Federal/Local codes, Code Rule-56, NYSED Part 155.5 and Student Occupancy.

**Locker Room Renovations:** Being bid as an Alternate; Both the Boys and Girls Locker room will undergo a full renovation during the Summer of 2022. An **AFTER-HOURS** abatement will take place in the space as well, along with all new floor and wall finishes, plumbing fixtures and modifications to the existing shower rooms. The renovation will include upgrades to the mechanical system with new RTUs and adjusted duct-work. Lockers will be provided by the Owner, on modified pads provided by the GC. Alike the Bathroom Renovations, each contractor will be held reliable for temporary provisions in case material will not be on site in time for the opening of school.

**Roof Project (N.I.C.):** Happening simultaneously with this work will be roof replacement/renovation that will be performed by a separate contract. All trades working on the bathroom project shall include coordination with this trade to execute his/her work at or below the roof level.



### **Poughkeepsie Middle School - SED No. 13-15-00-01-0-015-021**

The only Middle School within the District, Poughkeepsie Middle School was erected as a part of a Bond Referendum authorized in 1967. The building houses a little under 1,000 student-pupil during the academic year.

The building has been phased into two separate phases to accommodate summer activities, such as summer academics. The building will be active with students and faculty requiring special consideration from each contractor for sound, dust and abatement mitigation.

**Bathroom Renovations:** The building will undergo a (12) large-group/student bathroom renovation along with an (10) single/faculty bathroom renovation, during the Summer of 2022. The remainder of bathrooms which will bid as an alternate will be renovated over the Summer 2023. Given the era of when the building was constructed, there will be an abatement throughout most of the bathrooms, specific to: presumed ACBM pipe-insulation, mirror glue dabs, etc., which are to be referenced throughout the Abatement Drawings and Environmental Report within the Specifications. The abatement process shall happen immediately **AFTER-HOURS** once school has dismissed for summer recess and in a means that is guided by Federal/Local codes, Code Rule-56, NYSED Part 155.5 and Student Occupancy.

**Roof Project (N.I.C.):** Happening simultaneously with this work will be roof replacement/renovation that will be performed by a separate contract. All trades working on the bathroom project shall include coordination with this trade to execute his/her work at or below the roof level.

### **Clinton Elementary School - SED No. 13-15-00-01-0-004-014**

One of four Elementary Schools within the District, Warring Elementary School was built prior to the New Deal Construction era in 1925. The building houses just under 400 students during the normal academic year.

The building will be mostly vacant over the Summer '22, with the only occupancy by small groups of faculty members and custodians.

**Bathroom Renovations:** The building will undergo a (6) large-group/student bathroom renovation along with a (4) single/faculty bathroom renovation, during the Summer of 2022. Given the era of the building's construction, there will be an abatement throughout most of the bathrooms, specific to: presumed ACBM pipe-insulation, mirror glue dabs, Fire-Doors, etc., which are referenced through the Abatement Drawings and Environmental Report within the Specifications. The abatement process shall happen immediately once school has dismissed for summer recess and in a means that is guided by Federal/Local codes, Code Rule-56, NYSED Part 155.5 and Student Occupancy.

### **Warring Elementary School - SED No. 13-15-00-01-0-005-013**



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One of four Elementary Schools within the District, Warring Elementary School was built prior to the New Deal Construction era in 1928. The building houses just under 400 students during the normal academic year.

The building will be mostly vacant over the Summer '22, with occupancy from small groups of faculty members and custodians. The staging areas will impact existing grass and fencing at the front of the building, which will need to be regraded and repaired when demobilizing from the project.

**Bathroom Renovations:** The building will undergo a (4) large-group/student bathroom renovation along with a (6) single/faculty bathroom renovation, during the Summer of 2022. Given the era of the building's construction with unknown modifications made over the years; there will be an abatement throughout most of the bathrooms, specific to: presumed ACBM pipe-insulation, mirror glue dabs, ACBM plaster ceilings, etc., which are referenced through the Abatement Drawings and Environmental Report within the Specifications. The abatement process shall happen immediately **AFTER-HOURS** once school has dismissed for summer recess and in a means that is guided by Federal/Local codes, Code Rule-56, NYSED Part 155.5 and Student Occupancy.

**Roof Project (N.I.C.):** Happening simultaneously with this work will be roof replacement/renovation that will be performed by a separate contract. All trades working on the bathroom project shall include coordination with this trade to execute his/her work at or below the roof level.

### **Smith Early Learning Center - SED No. 13-15-00-01-0-008-022**

Deemed a magnet school for grade school students within the District, Smith ELC was originally constructed in 1912, with a second building nearly the same size of the originally building added several years later. The building can house just under 300 students during the normal academic year.

The building will be mostly vacant over the Summer '22, with occupancy from small groups of faculty members and custodians. Special consideration will still be needed to mitigate dust, sound and odors throughout construction.

**Bathroom Renovations:** The building will undergo a (6) large-group/student bathroom renovation along with a (7) single/faculty bathroom renovation, during the Summer of 2022. Given the era of the building, there will be an abatement throughout most of the bathrooms, specific to: presumed ACBM pipe-insulation, mirror glue dabs, ceramic tile adhesive, etc., which are referenced through the Abatement Drawings and Environmental Report within the Specifications. The abatement process shall happen immediately once school has dismissed for summer recess and in a means that is guided by Federal/Local codes, Code Rule-56, NYSED Part 155.5 and Student Occupancy.

### **Columbus School - SED No. 13-15-00-01-0-001-014**

Originally one of the District's Elementary Schools, Columbus School was built prior to the New Deal Construction era in 1928 on an existing site of a previous elementary school building. The building is no longer used for academic purposes and serves as the District's current Administration Building which houses 20+ personnel.



The building will be fully occupied over each summer with 12-month staff who will conduct business during normal business hours. The project has been phased to impact one side of the building during the Summer '22 and the other during the Summer '23.

**Bathroom Renovations:** The building will undergo a (3) large-group bathroom renovation along with a (1) single bathroom renovation, during the Summer of 2022 and Summer 2023. Given the era of the building, there will be an abatement throughout most of the bathrooms, specific to: presumed ACBM pipe-insulation, mirror glue dabs, etc., which are referenced throughout the Abatement Drawings and Environmental Report within the Specifications. The abatement process shall happen immediately **AFTER-HOURS** once school has dismissed for summer recess and in a means that is guided by Federal/Local codes, Code Rule-56, NYSED Part 155.5 and Student Occupancy.

## **VI. SCHOOL OPERATIONS & CONTRACTOR WORK HOURS**

Each project will impact many areas within existing buildings, which in some cases will remain in operation during construction.

All contract work occurring **over the summer recess**, outside of school session, may be performed during the hours of 7:00am and 4:00pm, with second-shift work happening continuously until 11:00pm - once approved by the CM & Owner. Any other contract work impacting the operation of the school, at any point over the project schedule, must be performed on an after-hours schedule, weekends or school holidays.

All contract work being performed **before and after the summer recess** – if permitted, during school session, will need to be performed after-hours (3:30pm-11:00pm). If approved, the contractor is responsible for abiding by the local sound ordinance for construction activities, and will be responsible for any fines they may incur if not followed. All punch-list work shall be performed after school hours on a second-shift schedule.

Each Prime Contractor may work Saturday & Sundays to make up for lost time (Saturday/Sunday work will be required if necessary to meet deadline) with prior approval from the Owner and after the Contractor has verified allowable working hours by town ordinance. If any Prime Contractor must work on either a Saturday, Sunday or a Holiday, in order to make up time that has been lost due to the same contractor, that Contractor will be responsible to reimburse the District for any custodial overtime costs.

**Abatement procedures happening at buildings with student and full staff occupancy will require those abatement activities to take place on a second shift schedule. This is specific to: Poughkeepsie High School, Poughkeepsie Middle School, and Columbus School.**

## **VII. SAFETY / LOGISTICS/STORAGE**

1. Two weeks after the receipt of the Notice of Award, each Prime Contractor for General Construction shall provide a Site Safety/Logistics Plan to the Construction Manager. The site logistics plan should minimally



include locations of the **eight-foot high temporary fence**, traffic plans for deliveries and removals, refuse container locations, crane locations, pick locations, boom radius, and lift locations. This plan shall also show the location of all staging and storage areas, non-rated and fire-rated partitions used to separate construction and school areas, made with plywood and/or gypsum wallboard, etc. The logistical information represented by the construction documents shall serve as a minimal guide.

2. Each prime contractor is to submit their corporate safety policy (2) weeks after Notice of Award . Plan to minimally meet OSHA standards. Each Prime Contractor shall make the participation of their subcontractors in this program mandatory. These Safety Programs should be a detailed Company Policy defining the specifics as to how a safe work environment shall be maintained
3. Each Prime Contractor and Sub Contractors shall schedule weekly safety meetings (Job Site Safety Talks) and submit meeting minutes indicating attendees and topics to the Construction Manager.
4. Each Prime Contractor is to identify in writing to the Construction Manager their "OSHA Competent Person Regarding Safety" Definition. "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
5. All flagmen required for deliveries to the site are to be furnished by the Prime Contractor responsible for the delivery. Any and all deliveries crossing the site or student traffic areas shall be escorted by flagmen. All flagmen shall wear orange vests. All deliveries shall be scheduled and coordinated with the Construction Manager and the Owner. Delivery blackout periods for bus traffic interference shall be established with the Construction Manager.
6. Smoking, firearms, alcoholic beverages, and indecent photography are expressly prohibited on all school properties. All persons representing Contractors, subcontractors or suppliers shall wear shirts, long pants and other proper attire while on school property. All persons representing Contractors, subcontractors or suppliers shall conduct themselves in a professional manner consistent with the rules and policies of The School District, and the New York State Education Department while on school property or otherwise representing this project.
7. Each Prime Contractor will ensure that all their employees, while on school property, will wear hard hats, high visibility vests, and ID badges at all times. Anyone on site without this the proper Personal Protection Equipment (PPE) will be escorted off school property.
8. Each Prime Contractor will ensure that every employee working on this project has completed a 10-hour OSHA training course. Any worker that cannot present a 10-hour OSHA safety-training card will be escorted off the property.
9. Food truck vendors for Construction Workers will only be allowed on school property with prior authorization from the School District. The District may allow or discontinue food vendor truck service at any time for any reason.



10. **Identification Badges.** Each Prime Contractor will provide an ID badge for each of their field personnel prior to coming on school property. All workmen shall display the badge on their person while on site, and at all times. Failure to wear identification badge at all times will result in the immediate removal from the jobsite.
11. Each Prime Contractor is responsible for their own storage and personnel trailers at each site. Each Contractor will be required to supply man trailers and storage box trailers as required. All costs related to its delivery, construction, protection, power, etc. is borne by the individual Contractors utilizing space. The Owner WILL NOT PROVIDE STORAGE SPACE. The placement of these trailers will be strictly limited to predetermined locations. Approval of the placement of any trailer or storage box must be received from the Construction Manager.
12. The parking for construction personnel shall be limited to designated parking areas only. Failure to abide by this rule will result in towing of cars at the expense of the Prime Contractor whom employs the individual.
13. All delivery vehicles/trucks/machinery/etc. permitted on site, must be equipped with back-up alarms and enter through the designated access points. Failure to demonstrate this ability will result in cancellation of delivery or stoppage of work. All delays associated with this cancellation will be the responsibility of the Prime Contractor responsible for the Work involved.
14. All temporary construction site fences installed by any Contractor shall be installed with a tightly woven, blind screen mesh. This mesh is to be installed on the "construction" side of the fence. The General Contractor will maintain all fencing daily and lock gates at the end of the day.
15. All crane picks, material delivery, etc. must be coordinated so as not to lift over any occupied area of the building. If absolutely necessary, this work shall be done on off hours to ensure the safety of the building occupants. Crane location must be carefully chosen to ensure the safety of building occupants. Crane picks must also not be conducted during academic hours within 20' of an occupied building.
16. The Owner or Construction Manager reserve the right to have all hoisting equipment periodically inspected by an independent inspector whose findings will be binding. The Prime Contractor at its own expense must make corrections before continuing work. The Owner or Construction Manager will not assume any responsibility for the safe operation of any hoisting equipment by exercising this right. Each Prime Contractor or Sub Contractor shall cooperate with the inspector by allowing time for the inspection. The Prime Contractor shall be notified 24 hours prior to the time of the inspection. These inspections do not release the Prime Contractor of their responsibility to provide all engineering, permits, and inspections as required by OSHA or the SED prior to use of any hoisting equipment.
17. All vehicular traffic (personal vehicles, trucks, equipment, deliveries, etc.) are to use the designated entrances as outlined on the Logistics Drawings. Access by other routes is to be on exception basis only.



## **VIII. SUBMITTALS**

1. Each copy of each submittal shall have attached as the cover page the specified "Submittal Cover Sheet". All information requested in "Section 01 33 00 Submittal Requirements" shall be provided by the respective Contractor. Submittals will be returned without review if the cover sheet is not accurately completed.
2. Each Prime Contractor shall generate a complete "Submittal Log" within one business week of the Notice of Award. This log is to list all required submittals specific to your trade as detailed in the Project Manual/Specs. See enclosed form for your use. "ROJ" stands for Required on Job to assist your judgment of the time gap between submission, Architect review, fabrication/procurement and on-site need for putting the work item into place.
3. Each Prime Contractor shall review all submissions for completeness. Each Prime Contractor is responsible to stamp all shop drawings prior to submission to the Architect. The Architect will not review any shop drawings unless first reviewed by said Contractor. Bundle similar material submissions for proper review. Use the Architects Submittal cover sheet located in the Specifications
4. **All submissions shall be sent electronically to the Architect. Submittals will be processed and stored electronically, with access available to all Prime Contractors for coordination. The District has elected to use the program NewForma for all project correspondence.**
5. Each Prime Contractor shall provide one transmittal for each submission package identifying each unique submission individually. For each submittal with the submission package, the Prime Contractor shall identify the length of the delivery time and the necessary "last date" an item may be received on site. Each Prime Contractor shall keep a log of all submissions in a manner prescribed by the Construction Manager and the attached form. Minimally, the Contractor shall update this submittal log biweekly and provide a copy to the Construction Manager for review and information.
6. Each Prime Contractor shall copy the Construction Manager's Project Manager on all transmittals, correspondence, RFI's and any other documents sent to the Architect, his consultants or the Owner
7. At the direction of the Construction Manager, each Prime Contractor shall provide copies of either document and/or data files for any requested document on one of the following programs: Microsoft Word, Microsoft Excel, or Primavera's SureTrack – Project Manager 2.0 scheduling program.

## **IX. LINE, LEVELS & GRADE**

1. Each Prime Contractor for General Construction shall establish a baseline and benchmark system for each area of renovation or component. This survey work shall be completed by a NYS licensed professional surveyor. The surveyor(s) employed to establish this system or to extend and maintain an existing benchmark system for the work of other trades shall not have less than five years' experience in performing construction surveys similar to the work they will perform for this project. The other Prime



Contractors and their subcontractors shall be responsible for extending these lines, levels and grades, and for performing all layouts for their own work. Each Prime Contractor is solely responsible for any damage or loss due to incorrect extension of lines, level or grades in their layout. Each Prime Contractor and their subcontractors shall be responsible for the accuracy with respect to the layout of their work. Any discrepancies or errors in the drawings, perceived by a Prime Contractor or subcontractor, shall be immediately reported to the Construction Manager and Architect. If any corrections are necessary, they shall be executed in accordance with procedures approved by the Construction Manager.

2. Each Prime Contractor and their subcontractors shall be responsible to offset, or to protect, their markings from anything that may disturb them.
3. Each Prime Contractor for General Construction and all other Contracts will build to existing conditions of the site and joining buildings. To confirm line, level and grade, the Prime General Construction Contractor will employ a licensed NYS surveyor by the end of the project and produce an 'As-Built' drawing including final elevations and boundaries of any structural or earth modifications.

## **X. MANAGEMENT OF WORK**

1. **Each Prime Contractor shall employ (from one week after Notice of Award until punch-list and closeout are complete) at a minimum a full-time Project Manager and a separate dedicated full-time on-Site Superintendent. The Project Manager and Site Super shall represent the Prime Contractor. All communications given to the Project Manager or Site Super either verbal or written shall be as binding. Important communications shall be so confirmed in writing.**
2. Each Prime Contractor shall provide copies of their daily construction reports to the Construction Manager's either through the Submittal Program or Electronically via E-mail. These reports shall be submitted no later than 10:00am the following workday. The daily reports shall provide detailed information concerning the Prime Contractors' activities and operation only. Daily Construction Reports to the Construction Manager shall detail manpower for each subcontractor and direct work-force, weather and work activities on site.
3. Each Prime Contractor shall have responsible representation at the **MANDATORY** weekly job meetings held at the Construction Manager's job office from Notice of Award thru close out. These meetings will be held to arrange for a satisfactory coordination of all building trades so as not to impede job progress. Prime Contractors or subcontractors who fail to attend the meetings will be **back-charged \$500.00 per each occurrence**.
4. Each Prime Contractor shall submit two-week look ahead schedules identifying the anticipated activity, and material needs for all of the work scheduled to be formed by the Prime Contractor and his subcontractors for the identified time period. Each Prime Contractor shall keep this schedule current and provide a biweekly report to the Construction Manager concerning the actual performance and activity compared to the two-week look ahead. The two-week look ahead shall be uploaded to the submittal Program by the End of Business of each weekly meeting.



5. The MEP Coordination shall follow the guidelines stated below:

- a. Each Prime Contractor shall have sufficient responsible representatives at mechanical/electrical/plumbing coordination meetings held at a location to be determined. These meetings shall be held as frequently as required by the Construction Manager or any other Prime Contractor. The General Construction Prime Contractor shall also include a representative at these meetings.
- b. All Contractors are expected to jointly produce coordination drawings. Prime Contractors are to first submit their respective shop drawings for approval, to the Owner's Architect and Engineers in order to make any necessary changes prior to going through the coordination process. The HVAC Contractor shall provide orange line CAD Drawings showing all of the approved ductwork. The HVAC Contractor shall locate on these CAD Drawings all piping in orange pencil/ lines. The Plumbing Contractor shall locate the plumbing lines on these CAD Drawings in blue pencil/ lines. The Electrical Contractor shall indicate conduit runs in green pencil/ lines. The General Construction Prime will have the last coordination review. As each coordination drawing is completed, Contractors are to meet with the Construction Manager and the Architect to review and resolve all identified conflicts on the coordination drawings.

Note: for areas without HVAC work, the Mechanical Prime shall provide the necessary CAD Drawings with black line. All coordination meetings will be held at the Construction Manager's office.

- c. It is the responsibility of the Prime Contractor for General Construction to coordinate all points of entry through the foundations, slab penetrations, sleeves, roof openings and penetrations, wall openings and penetrations etc. with the work of all other Contractors, including but not limited to M. E. P. Primes, kitchen equipment, casework and casework accessories.
  - d. It is the responsibility of each Prime Contractor to coordinate with the architectural details and elements, such as soffits, variations in ceiling height and materials, fire/smoke partitions or barriers, folding partition, doors, lockers, and any other general construction items that impact the space above the ceiling or otherwise requiring light framing and/or miscellaneous support or bracing.
6. Site cleanliness: If any Prime Contractor fails to keep the site safe and clean within four hours of being notified by the Construction Manager either verbally or in writing, the Construction Manager will have this work performed and back charged to the appropriate Prime Contractor at prevailing overtime rates plus 15%. Notice to field personnel is deemed notice to this Prime Contractor.
7. Dust and fume control is essential to the reduction of health risks to the surrounding personnel. Methods of dust control shall include but not be limited to the following:
- a. Adequate ventilation.
  - b. Wetting down.
  - c. Keeping bags of insulating materials, cement, etc. closed.
  - d. Controlled mixing of materials under field conditions.



- e. Special attention should be utilized in sawing of insulation and certain acoustical materials and storage of materials.
  - f. Job housekeeping must be maintained.
  - g. Advising all personnel of hazardous conditions, including supervisors and workmen.
  - h. Installing temporary barriers.
  - i. Each Prime Contractor shall be responsible for instituting the above policies to insure minimal impact to surrounding occupied areas.
8. Each Prime Contractor shall confine operations on the premises to areas designated by the Construction Manager and permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the premises with any materials or equipment. Each Prime Contractor shall coordinate all of his operations with, and secure approval from, the Construction Manager before using any portion of the Premises. Field personnel are to be confined to the work area assigned.
9. Where material is specified to be furnished by others or furnished and delivered only, the Prime Contractor installing the material shall be responsible for scheduling the delivery and receiving, unloading, storing, handling, relocating, hoisting, distribution, laying out and installing this material. Upon receipt of material by the Prime Contractor installing the material, any risk of loss and damage of the material shall be the responsibility of that Prime Contractor accepting the material.
10. All Prime Contractors and their subcontractors shall allow sufficient time to inspect and accept the work of the previous Contractors. Should any discrepancies be discovered, The Construction Manager shall be notified sufficiently in advance so that corrective action can be agreed to and taken (by all necessary parties) without affecting the progress of any Contractor or the work.
11. All Prime Contractors are advised to exert the utmost care and diligence when working in or near any existing buildings or site work which is to remain. The absence of protection around such items shall not excuse any of the Prime Contractors from their liability to provide protection. Any damages to the existing buildings, sitework or facilities shall be repaired and expensed to the responsible Prime Contractor.
12. Each Prime Contractor shall be solely responsible to remove and replace the existing ceiling tiles and grid in areas of the existing building where their work is required but new ceilings are not scheduled. In the event that the existing ceilings are damaged and cannot be replaced to the satisfaction of the Owner, the responsible Prime Contractor shall be solely responsible for replacing, in kind, the existing ceilings with new tile and grid. A qualified Contractor, acceptable to the Owner, shall perform all ceiling replacements.
13. All disconnect and/or tie-in work involving any utilities that would interfere with the ongoing operations of the Owner shall be completed on an after-hours basis. The performance of this work shall be projected on the required schedules and the Owners Representative is to be notified at least forty-eight hours in advance of commencing with this work. All overtime and standby personnel necessary to complete these tie-ins shall be the responsibility of the Prime Contractor performing the work.
14. At the same time the Prime Contractor submits their Insurance Certificate they shall also submit to the Construction Manager the labor rates of each category of labor for which he or his subcontractors shall employ (either directly or indirectly). This information shall be itemized in the format shown below.



March 28, 2022  
 Contract Documents  
 SED No. 13-15-00-01-0-007-018  
 SED No. 13-15-00-01-0-015-021  
 SED No. 13-15-00-01-0-004-014  
 SED No. 13-15-00-01-0-005-013  
 SED No. 13-15-00-01-0-001-014  
 SED No. 13-15-00-01-0-008-022

Poughkeepsie City School District  
 Phase 1B Building Improvements  
 Poughkeepsie High School  
 Poughkeepsie Middle School  
 Clinton Elementary School  
 Warring Elementary School  
 Columbus School  
 Early Learning Center

Contractor's Name					
Contractor's Address					
Contractor's Office Phone					
Contractor's Fax Number					
Contractor's Email Address					
<b>Labor Rate Breakdown</b>					
Worker's Title		Journey man	1.5 Rate	Fore man	1.5 Rate
Base Hourly Rate					
<b>Payroll Tax &amp; Insurance:</b>	<b>% Per Hr</b>				
FICA					
Federal Unemployment					
State					
Workers Compensation					
Disability					
Other (Explanation Required)					
<b>Subtotal</b>					
<b>Benefits:</b>	<b>\$ Per Hr</b>				
Vacation					
Health & Welfare					
Pension					
Annuity					
401K Fund					
Other (Explanation Required)					
Other (Explanation Required)					
<b>Subtotal</b>					
<b>Hourly Labor Rate</b>					

## **XI. REQUEST FOR INFORMATION (RFIs)**

1. Refer to the specifications for a complete explanation of the Request For Information process, and copy of the RFI form. RFIs will be corresponded electronically and will be required for an interpretation needed by the Architect of the Drawings and Specifications. Questions asked within the field to the Architect or



Engineer, shall be recorded by the prime contractor asking the question and submitted via RFI for formality.

## **XII. TESTING/INSPECTIONS**

1. If NYSED, the Architect or Owner or determines that any work requires special inspection, testing or approval, the Construction Manager will instruct the Prime Contractor of such special inspection, or testing. If such special inspection or testing reveals a failure of the work to comply with the requirements of the Contract Documents, the Prime Contractor responsible shall bear all costs thereof, including compensation for the Architect's, Construction Manager, and Testing Lab costs.
2. Each Prime Contractor shall furnish incidental labor to:
  - a. Provide access to the work to be tested, sampled, and inspected.
  - b. Obtain and handle samples at the project site or at the source of the product to be tested.
  - c. Facilitate inspections, samplings and tests.
  - d. Coordinate with the Owners Rep and testing lab and submit schedule of required tests one week in advance.
  - e. Coordinate inspections
3. As they relate to the timely prosecution of the work, all Prime Contractors shall coordinate independent testing and inspections. If any Prime fails to coordinate such inspections and additional costs are incurred to the Owner, the Prime Contractor will be responsible for that inspection cost.
4. **The following is a list of intended controlled inspections:**
  - a. Soil bearing, sub-grade inspection and/or compaction
  - b. Concrete field and plant testing & rebar placement
  - c. Masonry or stone field inspection, mortar sampling, reinforcement placement inspection
  - d. Structural steel field welding, bolting, connections, and metal deck
  - e. Asphalt and sub-base inspection
  - f. Soil compaction, density and sieve analysis testing, soil bearing
  - g. Water and air infiltration for windows
  - h. Roofing & flashing – **by Contractor performing the work**
  - i. Waterproofing
  - j. Under slab plumbing work – **by Contractor performing the work**
  - k. Firestopping
  - l. Fireproofing
  - m. Underwriters/UL inspection – **by Contractor performing the work**
  - n. Asbestos air monitoring
5. The Architect and Construction Manager shall be notified twenty-four hours prior to the need of testing, in the event the Contractor does not give proper notification and the work is done with no test, that Contractor will bear all costs for such tests.
6. **All controlled inspection testing costs will be paid for by the Owner except as noted above.**



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SED No. 13-15-00-01-0-005-013  
SED No. 13-15-00-01-0-001-014  
SED No. 13-15-00-01-0-008-022

Poughkeepsie City School District  
Phase 1B Building Improvements  
Poughkeepsie High School  
Poughkeepsie Middle School  
Clinton Elementary School  
Warring Elementary School  
Columbus School  
Early Learning Center

7. As part of the two-week look ahead, each Prime Contractor shall provide the Construction Manager with a schedule of all anticipated on-site Owner supplied inspections (if any are required). The Prime Contractor shall submit all requests for Owner-supplied inspection for all items of controlled inspection by 1:30 p.m. of the day previous.

### **XIII. CHANGES TO THE WORK**

1. Refer to Article 7 of the General Conditions for additional information pertaining to this subject.
2. All change proposals for extra work by the Prime Contractors shall be submitted to the Construction Manager, with a complete labor and material breakdown and on the basis of net difference in quantities. The Owner reserves the right to request adequate back up such as invoices, subcontractor quotes, etc., to substantiate the change order cost. Current labor rates for all trades are to be submitted to the Construction Manager by the respective Prime Contractors at the first scheduled job meeting. When both additions and deductions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of net increase or decrease.

**All change requests shall follow the cost breakdown found in § 7.2.1 of Article 7 located in the General Conditions.**

### **XIV. SCHEDULE OF VALUES/PAYMENTS**

1. Within one week after Notice of Award , the Prime Contractor shall submit a detailed billing breakdown on the AIA G702/ G703 – CM Version form for approval by Construction Manager and Architect. No payments will be made until such billing breakdown is approved.
2. The schedule of values will be reviewed and adjusted if necessary. Once approved, the schedule of values is to be used for the AIA pay application. The schedule of value will take into account and include at minimum the following items:
  - a. Bonds/Insurance based on actual invoice amount
  - b. Labor and material shown per line items greater than \$5,000 in work.
  - c. Submittals - 1% of contract sum
  - d. Punch list - 1% of contract sum
  - e. Close-out documents/warranties - 3% of the contract sum
  - f. Meeting Attendance & Meeting Documentation - 2% of the contract sum
  - g. Allowances
  - h. Approved Alternates
  - i. Labor and Material breakdown for each line Item

*Note: Punch list value will be dispersed only when the work has been confirmed to be completed 100%.  
ALL PAYMENT APPLICATIONS SHALL INCLUDE A 5% RETAINAGE FACTOR.*

3. The Owner has elected to require the Prime Contractor to submit releases of liens with respect to all Work previously performed and for which payments were made under a preceding application. Beginning with



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SED No. 13-15-00-01-0-005-013  
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the second payment requisition and with each subsequent payment requisition, each Prime Contractor shall furnish to Owner the following documents:

- a. Labor and/or Materials Affidavit
  - b. Daily and Weekly Wage Affidavit
  - c. Prime Contractor's-Partial Release and Wavier of Lien
4. Monthly Payment Applications for Payments shall be made as per Article 9 of the General Conditions of the Contract
  5. All Payment Applications for Payment are to include certified payroll for each employee working directly under the Prime Contractor, as well as all subcontractors working under agreements with the Prime Contractor.
  6. All Payment Application for Payment are to include 10-Hour (or higher) OSHA cards for all workers listed on the certified payrolls.

## **XV. PUNCH LIST**

1. Upon substantial completion of each phase of work, each Prime Contractor is to submit to the Owner/Architect/Construction Manager a letter declaring the work is substantial complete. Included with said letter is to be the Contractor's punchlist.

Upon the receipt of above, the Construction Manager will schedule with the Owner, Architect, and Contractor a walk through to develop an Owner's punchlist. This Owner's punchlist agreed by all parties shall serve as the only punchlist. Upon failure to complete the Owner's punchlist within four weeks from receipt, the Owner reserves the right to complete same work and backcharge the costs of material, labor, supervision and other incidental costs.

## **XVI. INSURANCE/INDEMNIFICATION**

1. All Prime Contractors must issue a Certificate of Insurance with liability limits as defined in the General Conditions and Division 01, naming Triton Construction Company, The Architect, The Architect's Consultants and the School District as an 'Additional Insured' in addition to all other parties as stipulated in the General Conditions of the Contract in the project manual.
2. All Prime Contractors agree to indemnify and hold harmless Triton Construction Company, The Architect, The Architect's Consultants, the School District, its agents and employees in addition to all other parties as stipulated in the General Conditions of the Contract in the project manual.
3. All Prime Contractors and Sub-Contractors/sub-subcontractor's/vendors/etc. insurance/indemnification shall comply with Article 11 "Insurance" as specified in the General Conditions of the Contract in the project manual.



## **Specific Scope Requirements for Each Prime Contractor**

***Each Prime Contractor is to refer to the technical specifications and drawings for further, or more comprehensive requirements.***

### **Prime Contractor for General Construction (PCGC)**

**Contracts: #3, #7, #11, #15, #19 & #23 – specific to the associated building/project.**

1. This Prime Contractor shall provide, for all the building construction work, all necessary site refuse containers and disposal services to maintain the site in a clean and safe condition. This Prime Contractor shall be responsible for emptying and/or replacing all containers on a regular basis or when full. All containers and disposal services shall be provided by a single entity. This Prime Contractor shall provide sufficient labor to keep the site clean on a daily basis and shall be responsible for providing the daily broom cleaning as necessary to maintain site safety.
2. This Prime Contractor shall coordinate with the; Electrician, Plumber, Mechanical and Plumbing Contractors to allow all Contractors unabated access to the building and surrounding work areas.
3. This Prime Contractor shall provide and maintain temporary chemical toilets for the duration of the project. The quantity of these toilets should be as required to properly maintain sanitary facilities and easy access for the personnel on the job. This quantity shall be a minimum of two toilets per major work area. This requirement shall include all necessary paper products, supplies and services, as well as the maintenance of these toilets until all work is complete and the Owner assumes partial occupancy of the completed work areas. As a minimum, this Contractor shall include the pumping and servicing of these toilets twice per week.
4. All Scaffolding or Stair Towers shall be designed and stamped by a licensed NYS PE. When designing this scaffolding consideration should be given to the environment, scaffolding system being used, means of access, means of tying the scaffolding to the structure, location, length of time to be erected, climate conditions, wrapping/containment of building, purpose of use, loadings, etc. all scaffolding and/ or stair tower access points must be secured while not in use. If and when needed, the scaffolding may be used for access by other Prime Contractors during construction- this contractor will not restrict access by others using the scaffold.
5. This Prime Contractor shall provide testing and inspection of the scaffolding on a daily basis and per governing regulation (e.g.,: OSHA). A log of these inspections are to be kept in the PCGC's job trailer, along with inspections tags that identify the status of the scaffolding (inspection dates, okay to use, caution, danger). Report to the Construction Manager all corrective work required through the course of the project.
6. As shown on the logistics plan, this Prime Contractor shall include in his bid price, all costs to provide an **8' ht.** rental type chain link construction fencing and gates. All fencing shall have a tightly woven, blind screen mesh installed on the "construction" side of the fence. Mesh to be dark green or black. When directed by the Construction Manager, this Prime Contractor shall remove and dispose of this fencing and all related materials. Gates for man access shall be passive to the exterior of the jobsite during the event



of an emergency, but remain closed for un-authorized entry during construction. All gates shall be locked when the site is not active, with a double-keyed system, granting the District access to the site at all times.

7. This Prime Contractor shall perform its steel erection according to their Site Logistics/Safety Plan. Booming steel over the Existing Building will not be permitted while occupied. Steel erection within 20 feet of an occupied building/space will require after-hours crane picks.
8. This Prime Contractor will repair, replace, correct, or finish grade, topsoil, and seed all areas with-in the construction site and staging area that was disturbed by the work of this project.
9. This Prime Contractor shall provide and maintain all temporary plastic barriers, partition walls, doors, hardware and plywood barriers for the duration of the project to separate work areas from public areas and to maintain security, dust, and noise control. Temporary partitions and doors will be painted with 1x coat of primer and 2x coats of paint for esthetics.
10. Construction Signage. The PCGC shall include in his base price all construction signage required by OSHA and the Site Logistics plans. At the site fence, "Construction Area keep out", "Hard Hats Required" and "Authorized personal only" signage shall be posted every 10' on site fencing. This Prime Contractor shall reference the logistics plans for each project to include any other signage designated for entry gates. Signs shall be made of either metal or durable PVC to endure the project duration.

This Prime Contractor shall also include signage for COVID-19 protection, alike the construction signage, stating "Keep Social Distance", "Wear Mask" and "Sanitize Frequently".

11. Professional Cleaning: The PCGC shall provide a professional commercial cleaning service to prepare all areas of interior construction for use and to provide a final cleaning after substantial completion is achieved and after direction to provide such service is received from the Construction Manager. This work shall be completed in cooperation with the building maintenance staff and their respective procedures.
12. Equipment Pads: Unless specifically noted on the contract documents, the associated Prime Contractor for the Equipment (PCGC, PCM, PCE, PCE) will provide all **interior and exterior** concrete equipment pads whether shown on the contract documents or not.

This Prime Contractor will provide any modifications to existing or provide new equipment pads for lockers, provided by the Owner, within locker rooms.

13. This Prime Contractor is responsible for protection of finished work. Including but not limited to; floors, walls, and doors. This Prime Contractor will provide, maintain, and remove the appropriate protection materials necessary to adequately protect his finished product.
14. This Prime Contractor should note there are numerous areas where the existing ceilings are remaining. This Contractor will be required to remove and reinstall any ceilings displaced by installation of this Contractor's Work. If open ceilings are not replaced within a twenty-four hour period after a request by the Construction Manager, either verbal or written, the Construction Manager will have said ceilings reinstalled and all related costs will be back charged to said Contractor.
15. Unless otherwise noted in the construction documents, this Prime Contractor will repair and patch all walls, floors, and ceilings to match adjacent finishes after the removal of interior partitions, ceilings, floors,



M.E.P. SP. Conduit, piping and ductwork. This includes all walls and ceilings above finished ceilings or spaces. Each Prime Contractor will cut and cap their own work inside finished walls, floors and ceilings.

16. This Prime Contractor shall provide fire extinguishers for the life of the project, the extinguishers are to be hung and identified as per OSHA requirements (1 per 3000 sq ft, or better). These extinguishers are to be re-charged and inspected for the life of the project.
17. If due to location of fabrication plant, a local storage yard is required, all cost associated with this storage yard including receiving, unloading, storing, shake-out, reloading, and delivery to the site shall be this Prime Contractors' cost.
  - a) The Owner may have an Inspector at the plant during the fabrication period. Appropriate access shall be provided at all times for this individual.
18. Abatement Work: This Prime Contractor will be responsible to hire a qualified and DOL licensed Abatement Contractor to perform ALL Hazardous Material removal at areas indicated in the drawings. This work will only take place during the summer recess or over an extended break/holiday with the Owner's approval.

**Where buildings will be occupied over the summer recess (Poughkeepsie HS, Poughkeepsie MS, Columbus School) all abatement activities shall take place after 3:30pm and no later than 7:00am each morning.**

19. Under slab MEP Trenching at New & Existing Slabs:

**New Slabs:** The Prime Contractor for General Construction (PCGC) will be responsible to coordinate with the MEP contractors and Construction Manager through the Contract Documents and the Coordination Drawings, for any under-slab piping. The PCGC will be responsible to provide the trenching, bedding, backfill and compaction for such MEP under-slab items. Each MEP Prime Contractor (the PCP, PCM & PCE) will be responsible to provide a final layout to the PCGC, prior to trenching. Each MEP Prime contractor will be responsible to level their piping with provided bedding from the PCGC, testing the piping prior to back filling.

**Existing Slabs:** Where existing slabs require new/modified underground MEP piping or conduit; The PCGC will be responsible to survey/mark-out, sawcut, trench, lay bedding, backfill, dowel/reinforce and place new concrete level with existing floors. Each MEP Prime Contractor (the PCP, PCM & PCE) will be responsible to provide a final layout to the PCGC, prior to trenching. Each MEP Prime contractor will be responsible to level their piping with provided bedding from the PCGC, testing the piping prior to back filling.

20. Openings in Existing Systems: Each respective Prime Contractor will be responsible to provide their own openings through existing wall, floor, and ceiling systems not shown to be removed on the Architectural Drawings. Where openings for MEPs are required in new wall, floor or ceiling systems, the GC shall coordinate with the respective MEP Prime contractor to locate those openings and frame the system to incorporate the new opening.
21. Core Drilling: Each respective Prime Contractor shall provide their own core drilling through existing and new wall, floor, foundation, or slab systems.



22. Roof Systems: In any case, the GC shall make all penetrations through the existing Roofing System with a qualified roofer who is certified on the existing roof system. Openings in the roof deck shall be coordinated by the respective contractor requiring the opening, and the opening shall be made by the PCGC, this Prime Contractor.
23. Each Prime Contractor is required to fire stop and/ or smoke stop all walls, floors and ceilings after completion of all their own work.
24. This Prime Contractor will hire the services of an underground utility surveyor to locate and mark all existing underground utilities and services with-in the Area of Work.
25. Floor Leveling for New Finishes: This Prime Contractor will remove and dispose of all flooring finishes, including mud-set, self-leveler or any other type of subbase, to get to the structural slab of each bathroom/locker floor. This Prime contractor will then survey the existing slab and provide either self-leveling or mud-set to match the elevation of the adjoining hallway or room. In no circumstance, shall the threshold of the door to an adjacent space or hallway compromise ADA guidelines. If so, this Prime Contractor shall repair the floor finish, subbase, and saddle to meet ADA Guidelines.
26. Wall Patching and Preparation for New Finishes: This Prime Contractor will remove existing tile, panels or other wall finishes to the face of the base wall. This Prime contractor shall survey, patch and level the existing walls to receive new tile or the specified finish. If cement board is used for leveling, approval by the Architect must be made prior to installation.
27. This Prime Contractor is responsible for protection of finished work. This Prime Contractor will provide, maintain, and remove the appropriate protection materials necessary to adequately protect finished product.
  - j) *Floor covering*: Once the finished floor is laid, this Prime contractor shall install and maintain sufficient protection such as: MDF, Plywood, "RamBoard", Polyethylene Film.
  - k) *Wall covering*: Once the wall finishes have been installed, this prime contractor shall protect the newly installed wall finishes with sufficient protection or correct all damages once the work is complete- prior to Substantial Completion.
28. This Prime Contractor will repair, replace, correct, or finish grade, topsoil, and seed all areas with-in the construction site that was disturbed by the work of this project, including any staging areas for material and equipment.
29. New Mechanical Roof Top Units, Exhaust Fans and Pipe Portals will be furnished and installed by the Mechanical Prime, with final Electrical/ Fire-Alarm terminations by the Electrical Prime under separate contracts. Roof Top Curbs and Pipe Portals will be furnished, lifted/picked, and set/installed by the Mechanical Contract Prime. Blocking for curbs, final flashing, roof deck penetrations/openings and structural reinforcing shall be by the PCGC Prime. Coordination between each trade to install the roof system and new curbs in a seamless matter is required per each Prime's contract. The following sequence clarifies the coordination between the General Construction Prime (PCGC), Mechanical (PCM) and Electrical (PCE) trades for New Mechanical RTU/ Exhausts Fan Equipment:
  - A. Roof Top Unit Curbs:



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Clinton Elementary School  
Warring Elementary School  
Columbus School  
Early Learning Center

1. Furnished, coordinated, lifted/picked and installed (excludes roof flashing and blocking) by Mechanical (PCM) Prime
2. Deck/Roof Opening, Structural Reinforcing, Blocking, Insulation and Roof Flashing by General Construction (PCGC) Prime
3. Pipe Portals/ Pitch Pockets Furnished by Mechanical (PCM) Prime
4. Pipe Portals/ Pitch Pockets Installed and Flashed by General Construction (PCGC) Prime
- B. Rooftop Dunnage
  1. Furnished, coordinated, lifted/picked and installed by General Construction (PCGC) Prime
  2. Deck/Roof Opening, Structural Reinforcing, Blocking, Insulation and Roof Flashing by General Construction (PCGC) Prime
- C. Mechanical Equipment (RTUs):
  1. Furnished, hoisted/picked and installed by Mechanical (PCM) Prime
  2. Piping by Mechanical (PCM) Prime
  3. Ductwork by Mechanical (PCM) Prime
  4. Controls by Mechanical (PCM) Prime
  5. Electrical by Electrical (PCE) Prime
  6. Fire Alarm/ Shutdowns by Electrical (PCE) Prime

Temporary protection of open curbs prior to units being installed, will be provided and maintained, by the General Construction Contractor in cooperation of all other trades. Water infiltration as a result the Mechanical or Electrical Prime not re-protecting open roof curbs, will be the sole responsibility of that trade to reimburse the PCGC Prime - to correct the temporary protection. Any damages to the interior finishes of the building, caused by water infiltration, will be the responsibility of that Prime Contractor causing the leak, to correct the damages per the terms of the General Conditions.

### **Prime Contractor for Plumbing (PCP)**

**Contracts: #6, #10, #14, #18, #22 & #26 – specific to the associated building/project.**

1. The Prime Contractor for General Construction (PCGC) shall provide dumpsters for this trade. Each Prime Contractor is responsible for collecting, moving, placing, breaking down boxes and pallets, and disposing rubbish, on a daily basis, all debris from their activities into a dumpster supplied by the PCGC. Each Prime Contractor is responsible to broom clean the areas they worked in at the end of each day.
2. The PCP shall use the dedicated staging areas for the PCP's Construction Field Office. The PCP will be required to remove and reinstall the fencing that surrounds this location for installation of the PCP's construction office. The PCP will be required to install electric, sanitary, water, phone, cable etc. at the PCP's expense. Electric bills to the trailer only will be paid by the Owner.
3. The Prime Contractor for Plumbing shall include, as part of his base price, all costs associated with providing one hose bib for temporary water service at each major building area (if this hose bib does not already exist). The Prime Contractor for Plumbing shall install these hose bibs at locations designated by the Construction Manager.
4. **Existing Ceilings:** This Prime Contractor (PCP) should note there are numerous areas where the existing ceilings are remaining. **This Contractor will be required to remove and reinstall any ceilings displaced by**



**installation of this Contractor's Work, where ceilings are not being removed on the Architectural Plans.**

If open ceilings are not replaced within a twenty-four hour period after a request by the Construction Manager, either verbal or written, the Construction Manager will have said ceilings reinstalled and all related costs will be back charged to said Contractor.

Any damage or dirt from the removal and reinstallation of ceiling systems, caused by this Prime Contractor will be the responsibility of this contractor to replace in kind, or better.

5. This Prime Contractor shall coordinate with the Electrician, General Construction Prime, and Mechanical Prime Contractors to allow all Contractors unabated access to the building.
6. **Access to Work within Existing Walls, Ceiling & Floors:** Unless otherwise noted in the construction documents, this Prime Contractor will cut and cap their own work inside finished walls, floors and ceilings. Access for removals, installation and capping within existing chase walls, walls, soffits or hard ceilings that are not indicated on the drawings for the PCGC to remove and replace- will be cut and patched by the MEP contractor requiring access. For shared access to the same wall/ceiling systems, the contractor with the most work will be responsible for cutting and patching the shared openings. Patching must be performed by a skilled tradesman of the associated work (carpentry, taping, painting, etc.,).
7. Each Prime Contractor is required to fire stop and/ or smoke stop all walls, floors and ceilings after completion of all their own work.
8. This Prime Contractor is responsible for protection of finished work. This Prime Contractor will provide, maintain, and remove the appropriate protection materials necessary to adequately protect his finished product.
9. **Equipment Pads:** Unless specifically noted on the contract documents, this Prime Contractor will provide all **interior and exterior** concrete equipment pads for their work, whether shown on the contract documents or not.
10. **Under slab MEP Trenching at New & Existing Slabs:**

**New Slabs:** This Prime contractor will be responsible to coordinate with the PCGC contractor and Construction Manager through the Contract Documents and the Coordination Drawings, for any under-slab piping. The Prime Contractor for General Construction (PCGC) will be responsible to provide the trenching, bedding, backfill and compaction for such MEP under-slab items. Each MEP Prime Contractor (the PCP, PCM & PCE) will be responsible to provide a final layout to the PCGC, prior to trenching. Each MEP Prime contractor will be responsible to level their piping with provided bedding from the PCGC, testing the piping prior to back filling.

**Existing Slabs:** Where existing slabs require new/modified underground MEP piping or conduit; The PCGC will be responsible to survey/mark-out, sawcut, trench, lay bedding, backfill, dowel/reinforce and place new concrete level with existing floors. Each MEP Prime Contractor (the PCP, PCM & PCE) will be responsible to provide a final layout to the PCGC, prior to trenching. Each MEP Prime contractor will be responsible to level their piping with provided bedding from the PCGC, testing the piping prior to back filling.



11. Openings in Existing Systems: Each respective Prime Contractor will be responsible to provide their own openings through existing wall, floor, and ceiling systems not shown to be removed on the Architectural Drawings. Where openings for MEPs are required in new wall, floor or ceiling systems, the GC shall coordinate with the respective MEP Prime contractor to locate those openings and frame the system to incorporate the new opening.  
Core Drilling: Each respective Prime Contractor shall provide their own core drilling through existing and new wall, floor/slab or foundation systems.
12. Roof Systems: In any case, this Prime Contractor (PCGC) shall make all penetrations through the existing Roofing System with a qualified roofer who is certified on the existing roof system. Openings in the roof deck shall be coordinated by the respective contractor requiring the opening, and the opening shall be made by the PCGC, this Prime Contractor.
13. Abated Piping Behind Chase/Walls: This Prime Contractor shall include an allowance within their contract to replace insulation behind walls being demolished for access to plumbing, which are being abated by the PCGC. The allowance shall include pipe insulation for all pipe quantities found in Section 02 0800, that are to be abated.

#### **Prime Contractor for Mechanical (PCM)**

##### **Contracts: #4, #8, #12, #16, #20 & #24 – specific to the associated building/project.**

1. The PCGC shall provide dumpsters for this contractor to use for day-to-day rubbish. Each Prime Contractor is responsible for collecting, moving, placing, breaking down boxes and pallets, and disposing rubbish, on a daily basis, all debris from their activities into a dumpster supplied by the PCGC. Each Prime Contractor is responsible to broom clean the areas they worked in at the end of each day. **This Prime Contractor will include in his bid price the provision to remove large HVAC equipment from the site, at his own costs, including but not limited to RTUs, Chillers, Unit Ventilators, and Air Handlers.** All other debris is to be disposed of in the PCGC's dumpsters.
2. The PCM shall use the dedicated staging areas for the PCM's Construction Field Office. The PCM will be required to remove and reinstall the fencing that surrounds this location for installation of the PCM's construction office. The PCM will be required to install electric, sanitary, water, phone, cable etc. at the PCM's expense. Electric bills to the trailer only will be paid by the Owner.
3. **Existing Ceilings**: This Prime Contractor (PCM) should note there are numerous areas where the existing ceilings are remaining. **This Contractor will be required to remove and reinstall any ceilings displaced by installation of this Contractor's Work, where ceilings are not being removed on the Architectural Plans.** If open ceilings are not replaced within a twenty-four hour period after a request by the Construction Manager, either verbal or written, the Construction Manager will have said ceilings reinstalled and all related costs will be back charged to said Contractor.

Any damage or dirt from the removal and reinstallation of ceiling systems, caused by this Prime Contractor will the responsibility of this contractor to replace in kind, or better.



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4. Equipment Pads: Unless specifically noted on the contract documents, this Prime Contractor will provide all **interior and exterior** concrete equipment pads for their work, whether shown on the contract documents or not.
5. This Prime Contractor shall coordinate with the Electrician, Plumber, Elevator and General Construction Prime Contractors to allow all Contractors unabated access to the building.
6. Access to Work within Existing Walls, Ceiling & Floors: Unless otherwise noted in the construction documents, this Prime Contractor will cut and cap their own work inside finished walls, floors and ceilings. Access for removals, installation and capping within existing chase walls, walls, soffits or hard ceilings that are not indicated on the drawings for the PCGC to remove and replace- will be cut and patched by the MEP contractor requiring access. For shared access to the same wall/ceiling systems, the contractor with the most work will be responsible for cutting and patching the shared openings. Patching must be performed by a skilled tradesman of the associated work (carpentry, taping, painting, etc.,).
7. Each Prime Contractor is required to fire stop and/ or smoke stop all walls, floors and ceilings after completion of all their own work.
8. This Prime Contractor is responsible for protection of finished work. This Prime Contractor will provide, maintain, and remove the appropriate protection materials necessary to adequately protect his finished product.
9. Openings in Existing Systems: Each respective Prime Contractor will be responsible to provide their own openings through existing wall, floor, and ceiling systems not shown to be removed on the Architectural Drawings. Where openings for MEPs are required in new wall, floor or ceiling systems, the GC shall coordinate with the respective MEP Prime contractor to locate those openings and frame the system to incorporate the new opening.
10. Core Drilling: Each respective Prime Contractor shall provide their own core drilling through existing and new wall, floor/slab or foundation systems.
11. Roof Systems: In any case, the GC shall make all penetrations through the existing Roofing System with a qualified roofer who is certified on the existing roof system. Openings in the roof deck shall be coordinated by the respective contractor requiring the opening, and the opening shall be made by the PCGC.
12. New Mechanical Roof Top Units and Exhaust Fans will be furnished and installed by the Mechanical Contract Prime, with final Electrical/ Fire-Alarm terminations by the Electrical Prime under separate contracts. Roof Top Curbs will be furnished, lifted/picked, and set/installed by the Mechanical Contract Prime. Blocking for curbs, final flashing, roof deck penetrations/openings and structural reinforcing shall be by the PCGC Prime. Coordination between each trade to install the roof system in a seamless matter is required per each Prime's contract. The following sequence clarifies the coordination between the General Construction Prime (PCGC), Mechanical (PCM) and Electrical (PCE) trades for New Mechanical RTU/ Exhausts Fan Equipment:
  - A. Roof Top Unit Curbs:



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1. Furnished, coordinated, lifted/picked and installed (excludes roof flashing) by Mechanical (PCM) Prime
2. Deck/Roof Opening, Structural Reinforcing, Blocking, Insulation and Roof Flashing by General Construction (PCGC) Prime
3. Pipe Portals/ Pitch Pockets Furnished by Mechanical (PCM) Prime
4. Pipe Portals/ Pitch Pockets Installed and Flashed by General Construction (PCGC) Prime
- B. Rooftop Dunnage
  1. Furnished, coordinated, lifted/picked and installed by General Construction (PCGC) Prime
  2. Deck/Roof Opening, Structural Reinforcing, Blocking, Insulation and Roof Flashing by General Construction (PCGC) Prime
- C. Mechanical Equipment (RTUs):
  1. Furnished, hoisted/picked and installed by Mechanical (PCM) Prime
  2. Piping by Mechanical (PCM) Prime
  3. Ductwork by Mechanical (PCM) Prime
  4. Controls by Mechanical (PCM) Prime
  5. Electrical by Electrical (PCE) Prime
  6. Fire Alarm/ Shutdowns by Electrical (PCE) Prime

Temporary protection of open curbs prior to units being installed, will be provided and maintained, by the General Construction Contractor in cooperation of all other trades. Water infiltration as a result the Mechanical or Electrical Prime not re-protecting open roof curbs, will be the sole responsibility of that trade to reimburse the PCGC Prime - to correct the temporary protection. Any damages to the interior finishes of the building, caused by water infiltration, will be the responsibility of that Prime Contractor causing the leak, to correct the damages per the terms of the General Conditions.

### **Prime Contractor for Electrical (PCE)**

#### **Contracts: #5, #9, #13, #17, #21 & #25 – specific to the associated building/project.**

1. The PCGC shall provide dumpsters for this contractor to use for day-to-day rubbish. Each Prime Contractor is responsible for collecting, moving, placing, breaking down boxes and pallets, and disposing rubbish, on a daily basis, all debris from their activities into a dumpster supplied by the PCGC. Each Prime Contractor is responsible to broom clean the areas they worked in at the end of each day.
2. The PCE shall use the dedicated staging areas for the PCE's Construction Field Office. The PCE will be required to remove and reinstall the fencing that surrounds this location for installation of the PCE's construction office. The PCE will be required to install electric, sanitary, water, phone, cable etc. at the PCP's expense. Electric bills to the trailer only will be paid by the Owner.
3. The Prime Contractor for Electrical is to temporarily support existing ceiling mounted equipment/devices (i.e., speakers, fire alarm apparatuses, exit signs, wiring, light fixtures, etc.) as required for demolition of existing ceilings until new equipment/devices are installed or existing equipment/device can be permanently remounted in the new ceiling by this Prime Contractor – whether shown on the plans or not.
4. The Prime Contractor for Electrical shall provide and keep temporary light and power operational for a period of from fifteen minutes before the earliest starting time of the earliest trade, to fifteen minutes



after the established quitting time of the trade which stops latest in the evening (fifteen foot candles) throughout the entire building (normal working hours 7:00 am to 4:00 pm, second-shift 3:00pm-11:00pm).

This applies to all scheduled workdays, Monday through Saturday inclusive, which are established as regular workdays for any trade engaged in the work, including such days that are holidays for Electricians but are regular workdays for other trades. These services are to be kept operational until the CM determines that they are no longer required for the execution of the work. Temporary light shall consist of a minimum of (1) bulb and cage per 10 square feet of floor space in all spaces no matter of size throughout the existing building spaces being renovated.

5. The Prime Contractor for Electrical shall include in his base price all costs associated with providing and maintaining adequate temporary light and power to all areas of work required by the construction documents. Each major area of work shall be provided with an adequate sized distribution panel for temporary light and power.
6. The Prime Contractor for Electrical shall provide temporary power for masonry work, mixers, steel work, or fire proofing work, compressors etc. that may require 220V temporary power. Power is to be provided at each major area of work if required.
7. **Existing Ceilings:** This Prime Contractor (PCE) should note there are numerous areas where the existing ceilings are remaining. **This Contractor will be required to remove and reinstall any ceilings displaced by installation of this Contractor's Work, where ceilings are not being removed on the Architectural Plans.** If open ceilings are not replaced within a twenty-four hour period after a request by the Construction Manager, either verbal or written, the Construction Manager will have said ceilings reinstalled and all related costs will be back charged to said Contractor.  
  
Any damage or dirt from the removal and reinstallation of ceiling systems, caused by this Prime Contractor will the responsibility of this contractor to replace in kind, or better.
8. The Prime Contractor for Electrical shall replace all burned out light bulbs, within the work areas, when building is turned over to the owner at substantial completion.
9. This Prime Contractor shall coordinate with the, Roofing Contractor, General Construction Prime, Plumber, Mechanical and Elevator Prime Contractors to allow all Contractors unabated access to the building.
10. **Access to Work within Existing Walls, Ceiling & Floors:** Unless otherwise noted in the construction documents, this Prime Contractor will cut and cap their own work inside finished walls, floors and ceilings. Access for removals, installation and capping within existing chase walls, walls, soffits or hard ceilings that are not indicated on the drawings for the PCGC to remove and replace- will be cut and patched by the MEP contractor requiring access. For shared access to the same wall/ceiling systems, the contractor with the most work will be responsible for cutting and patching the shared openings. Patching must be performed by a skilled tradesman of the associated work (carpentry, taping, painting, etc.,).
11. Each Prime Contractor is required to fire stop and/ or smoke stop all walls, floors and ceilings after completion of all their own work.



12. This Prime Contractor is responsible for protection of finished work. This Prime Contractor will provide, maintain, and remove the appropriate protection materials necessary to adequately protect his finished product.
13. This Prime Contractor will modify all existing Fire Alarm devices that are part of the existing building being renovated, maintain the devices throughout construction, and or disconnect as needed. This Prime Contractor will assure that no troubles exist, by hiring a Fire Alarm vendor who is licensed to modify the existing Fire Alarm system to accept any temporary changes through construction.

Surface Mounted Devices: This Prime Contractor shall remove all existing surface-mounted Fire Alarm Devices such as Strobes, Horns, Pull-Stations, etc., on walls receiving new finishes, such as Tile, etc., and shall reinstall devices on face of new finish. This includes any type of surface-mounted conduit/ wire-mold.

Recessed Devices: This Prime Contractor shall modify any in-wall/recessed Fire-Alarm boxes for devices such as Strobes, Horns, Pull-Stations, etc., with collars or extensions to meet the face of the new wall finish in areas where existing walls are receiving new finishes, such as tile, etc.,.

14. This Prime contractor will modify existing power devices where walls are receiving new finishes, such as Tile, etc.,.

Surface Mounted Devices: This Prime Contractor shall remove all existing surface-mounted Electrical Devices such as light switches, receptacles, junction boxes, etc., on walls receiving new finishes, such as Tile, etc., and shall reinstall devices on face of new finish. This includes any type of surface-mounted conduit/ wire-mold.

Recessed Devices: This Prime Contractor shall modify any in-wall/recessed Electrical Devices such as light switches, receptacles, junction boxes, etc., with collars or extensions to meet the face of the new wall finish in areas where existing walls are receiving new finishes, such as tile, etc.,.

15. This Prime Contractor is to develop a separate site-specific electrical service shutdown/upgrade schedule within four weeks after Notice of Award. This schedule will be developed in conjunction with the Construction Manager and the Owner. No shutdown/transfer will be permitted at any time without prior written notification. The Prime Contractor for Electrical shall provide temporary power for all 'others' work ongoing at the site during any electrical shutdown or transfer period that would otherwise deny other Contractors power. No shutdown or transfer shall be allowed during active school hours. Any and all shutdowns must be scheduled on the Owners off days (weekends, holidays). Any shutdown longer than three days will require this Prime Contractor to supply temporary power for the Owner (i.e., generators). The Electrical Prime Contractor shall provide a minimum of forty-eight hours' notice to the Owner and the Construction Manager or any necessary power shutdown.

16. **Under slab MEP Trenching at New & Existing Slabs:**

**New Slabs:** This Prime contractor will be responsible to coordinate with the PCGC contractor and Construction Manager through the Contract Documents and the Coordination Drawings, for any under-slab piping. The Prime Contractor for General Construction (PCGC) will be responsible to provide the trenching, bedding, backfill and compaction for such MEP under-slab items. Each MEP Prime Contractor (the PCP, PCM & PCE) will be responsible to provide a final layout to the PCGC, prior to trenching. Each



MEP Prime contractor will be responsible to level their piping with provided bedding from the PCGC, testing the piping prior to back filling.

**Existing Slabs:** Where existing slabs require new/modified underground MEP piping or conduit; The PCGC will be responsible to survey/mark-out, sawcut, trench, lay bedding, backfill, dowel/reinforce and place new concrete level with existing floors. Each MEP Prime Contractor (the PCP, PCM & PCE) will be responsible to provide a final layout to the PCGC, prior to trenching. Each MEP Prime contractor will be responsible to level their piping with provided bedding from the PCGC, testing the piping prior to back filling.

13. New Mechanical Roof Top Units and Exhaust Fans will be furnished and installed by the Mechanical Contract Prime, with final Electrical/ Fire-Alarm terminations by the Electrical Prime under separate contracts. Roof Top Curbs will be furnished, lifted/picked, and set/installed by the Mechanical Contract Prime. Blocking for curbs, final flashing, roof deck penetrations/openings and structural reinforcing shall be by the PCGC Prime. Coordination between each trade to install the roof system in a seamless matter is required per each Prime's contract. The following sequence clarifies the coordination between the General Construction Prime (PCGC), Mechanical (PCM) and Electrical (PCE) trades for New Mechanical RTU/ Exhausts Fan Equipment:

D. Roof Top Unit Curbs:

1. Furnished, coordinated, lifted/picked and installed (excludes roof flashing) by Mechanical (PCM) Prime
2. Deck/Roof Opening, Structural Reinforcing, Blocking, Insulation and Roof Flashing by General Construction (PCGC) Prime
3. Pipe Portals/ Pitch Pockets Furnished by Mechanical (PCM) Prime
4. Pipe Portals/ Pitch Pockets Installed and Flashed by General Construction (PCGC) Prime

E. Rooftop Dunnage

1. Furnished, coordinated, lifted/picked and installed by General Construction (PCGC) Prime
2. Deck/Roof Opening, Structural Reinforcing, Blocking, Insulation and Roof Flashing by General Construction (PCGC) Prime

F. Mechanical Equipment (RTUs):

1. Furnished, hoisted/picked and installed by Mechanical (PCM) Prime
2. Piping by Mechanical (PCM) Prime
3. Ductwork by Mechanical (PCM) Prime
4. Controls by Mechanical (PCM) Prime
5. Electrical by Electrical (PCE) Prime
6. Fire Alarm/ Shutdowns by Electrical (PCE) Prime

Temporary protection of open curbs prior to units being installed, will be provided and maintained, by the General Construction Contractor in cooperation of all other trades. Water infiltration as a result the Mechanical or Electrical Prime not re-protecting open roof curbs, will be the sole responsibility of that trade to reimburse the PCGC Prime - to correct the temporary protection. Any damages to the interior finishes of the building, caused by water infiltration, will be the responsibility of that Prime Contractor causing the leak, to correct the damages per the terms of the General Conditions.



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14. Openings in Existing Systems: Each respective Prime Contractor will be responsible to provide their own openings through existing wall, floor, and ceiling systems not shown to be removed on the Architectural Drawings. Where openings for MEPs are required in new wall, floor or ceiling systems, the GC shall coordinate with the respective MEP Prime contractor to locate those openings and frame the system to incorporate the new opening.
15. Core Drilling: Each respective Prime Contractor shall provide their own core drilling through existing and new wall, floor/slab or foundation systems.
16. Roof Systems: In any case, the GC shall make all penetrations through the existing Roofing System with a qualified roofer who is certified on the existing roof system. Openings in the roof deck shall be coordinated by the respective contractor requiring the opening, and the opening shall be made by the PCGC.



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**SECTION 01 2100  
ALLOWANCES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
  - 1. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
  - 1. Contingency allowances.

**1.02 SELECTION AND PURCHASE**

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

**1.03 ACTION SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

**1.05 COORDINATION**

- A. Coordinate allowance items with other portions of the Work.

**1.06 CONTINGENCY ALLOWANCES**

- A. Use the contingency allowance only as directed by Architect for Owner's purposes.
- B. Contractor's overhead and profit for work ordered by Owner under the contingency allowance is included in the Contract Sum and is not part of the Allowance.
- C. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

**1.07 ALLOWANCE DISBURSEMENT "REQUEST FOR PROPOSALS"**

- A. Submit proposals for changes in the scope in the form of the "Request for Proposal" as described in Division 01, Section "CONTRACT MODIFICATION PROCEDURES".
- B. Once all parties have agreed to the terms and methods of the change, a Change Order will be issued.

**1.08 UNUSED MATERIALS**

- A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.



1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

**3.02 PREPARATION**

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

**3.03 SCHEDULE OF ALLOWANCES**

- A. Each Contract shall include a Contingency Allowance in the Base Bid of **5% of the Base Bid** for use according to the Owner's instructions.
  1. Contractor overhead and profit is provided in the Base Bid.

**3.04 POUGHKEEPSIE HIGH SCHOOL - GENERAL CONSTRUCTION - PART 1 SCHEDULE OF ALLOWANCES**

**END OF SECTION**



**SECTION 01 2200  
UNIT PRICES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for unit prices.

**1.02 DEFINITIONS**

- A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

**1.03 PROCEDURES**

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: Unit prices, if any, are included on the Form of Proposal.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



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**SECTION 01 2500  
SUBSTITUTION PROCEDURES**

**PART 1 GENERAL**

**1.01 GENERAL**

- A. Should the Contractor desire to substitute other articles, materials, apparatus, products or processes than those specified or approved as equal, the Contractor shall apply to the Architect in writing for approval of such substitution. It should be noted that the bid shall not be based on a substituted article, material, apparatus, product or process. With the application shall be furnished such information as required by the Architect to demonstrate that the article, material, apparatus, product or process he wishes to use is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended. The Contractor shall set forth the reasons for desiring to make the substitution and shall further state what difference, if any, will be made in the construction schedule and the contract price for such substitution should it be accepted; it being the intent hereunder that any savings shall accrue to the benefit of the Owner.
- B. The Architect shall reject any such desired substitution as not being specifically named in the contract, or if he shall determine that the adjustment in price in favor of the Owner is insufficient, the Contractor shall immediately proceed to furnish the designated article, material, apparatus, product or process.
- C. Request for substitutes shall conform to the requirements of this Article.
- D. Requests for substitutions shall, include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.
- E. Requests for utilization of substitutes will be reviewed during the course of the project. The impact on the project and the timeliness of submission will be of key consideration.
- F. The approval of utilization of a substitute is subject to the sole and final discretion of the Architect.

**1.02 SUMMARY**

- A. Section includes administrative and procedural requirements for substitutions.

**1.03 DEFINITIONS**

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.
- B. Substitute Items (Or Equal): If in Architect/Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item it will be considered a proposed substitute item.

**1.04 ACTION SUBMITTALS**

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use **form provided in Project Manual**.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication, or installation cannot be provided, if applicable.



- b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
  - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
  - n. See additional requirements in Article 2.3 DETAILED SUBSTITUTION PROCEDURES
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within **five** days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within **10** days of receipt of request, or **five** days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## **1.05 QUALITY ASSURANCE**

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

## **PART 2 PRODUCTS**

### **2.01 SUBSTITUTION PROCEDURES (GENERAL)**

- A. Conditions: After the "Notice of Award" and prior to the Contractor entering into a Formal Contract with the Owner, the Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:



1. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  2. Substitution results in substantial cost savings to the Owner or substantial performance improvements.
  3. Substitution request is fully documented and properly submitted.
  4. Requested substitution will not adversely affect Contractor's construction schedule.
  5. Requested substitution has received necessary approvals of authorities having jurisdiction.
  6. Requested substitution is compatible with other portions of the Work.
  7. Requested substitution has been coordinated with other portions of the Work.
  8. Requested substitution provides specified warranty.
  9. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
  10. The substitution is submitted in compliance with Article 2.3 DETAILED SUBSTITUTION PROCEDURES
- B. If the Contractor does not present "Substitutions" in the time frame noted above any future requests to substitute products will not be considered, unless the substitution is for cause.
- C. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

## 2.02 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than **20** days prior to time required for preparation and review of related submittals.
1. Architect will consider Contractor's request for substitution when the following conditions are present.
    - a. The specified product is not available
    - b. The specified product cannot be delivered in the time frame required under the Project Schedule.
  2. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Requested substitution provides sustainable design characteristics that specified product provided.
    - c. Substitution request is fully documented and properly submitted.
    - d. Requested substitution will not adversely affect Contractor's construction schedule.
    - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - f. Requested substitution is compatible with other portions of the Work.
    - g. Requested substitution has been coordinated with other portions of the Work.
    - h. Requested substitution provides specified warranty.
    - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received **within 10 days after the Notice of Award** and based on the following
1. The proposed product substitution will result in a significant cost savings to the Owner.
  2. The proposed product has substantial performance improvements.
  3. The proposed product can be provided much earlier in the schedule enhancing the project completion date.
-



4. The proposed product warranty is superior to the specified item.

### **2.03 DETAILED SUBSTITUTION REVIEW PROCEDURES**

- A. The Architect in addition to the requirements listed above will require compliance with the following requirements and procedures.
  1. Requests for approval of substitutions will be received and considered from Prime Contractors only and not from manufacturers, suppliers, Subcontractors, or other third parties.
  2. If the materials and equipment submitted are offered as substitutions to the Contract Documents or approved equal, the Contractor shall advise the Owner and the Architect of the requested substitutions and comply with the requirements hereinafter specified in this Article.
  3. Where the acceptability of substitution is conditioned upon a record of and the proposed substitution does not fulfill this requirement, the Architect, at the Architect's sole discretion, may accept the substitution if the Contractor provides a bond or cash deposit which guarantees replacement at no cost to the Owner for any failure occurring within a specified time. The substitution item must meet all other technical requirements contained in the Specification.
  4. The Contractor shall furnish such information as required by the Architect to demonstrate that the equal article, material, apparatus, product or process is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended and/or that it offers substantial benefits to the Owner in saving of time and/or cost. The Contractor shall set forth the reasons for desiring to make this substitution.
  5. Contractor shall submit:
    - a. For each proposed request for approved substitute sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Architect to determine if the proposed request for approval should be granted, including manufacturer's brand or trade names, model numbers, description of specification of item, performance data, test reports, samples, history of service, and other data as applicable.
    - b. Certified tests, where applicable, by an independent laboratory attesting to the performance of the substitute.
    - c. A list of installations where the proposed substitute equipment or materials is performing under similar conditions as specified.
    - d. A list of installations where the proposed substitute equipment or materials is performing under similar conditions as specified.
  6. Where the approval of a substitute requires revision or redesign of any part of Work, including that of other Contracts, all such revision and redesign, and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Architect.
  7. In the event that the Architect is required to provide additional services, then the Architect's charges for such additional services shall be paid by the Contractor to the Owner.
  8. Any modifications in the Work required under other contracts to accommodate the changed design will be incorporated in the appropriate contracts and any resulting increases in contract prices will be charged to the Contractor by the Owner who initiated the changed design.
  9. In all cases, the Architect shall be the judge as to whether a proposed substitute is to be approved. The Contractor shall be bound by the Architect's decision. No substitute items shall be used in the Work without written approval of the Architect.
  10. In making request for approval of substitute, Contractor represents that:
    - a. Contractor has investigated proposed substitute and determined that it is equal to or superior in all respects to the product, manufacturer or method specified or offers other specified advantages to the Owner.



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- b. Contractor will provide the same or better warranties or bonds for proposed substitute as for product, manufacturer or method specified.
  - c. Contractor waives all claims for additional costs or extension of time related to proposed substitute that subsequently may become apparent.
  - d. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Architect in considering a substitute proposed by the Contractor or by reason of failure of the Architect to approve a substitute proposed by the Contractor. Any delays arising out of consideration, approval, or utilization of a substitute shall be the sole responsibility of the Contractor requesting the substitute and it shall arrange its operations to make up the time lost.
11. Proposed substitute will not be accepted if:
    - a. Acceptance will require substantial revision of Contract Documents.
    - b. Acceptance will substantially change design concepts or Technical Specifications.
    - c. Acceptance will delay completion of the Work, or the Work of other Contractors.
    - d. If the Substitute item is not accompanied by formal request for approval of substitute from Contractor.
  12. The Architect reserves the right to disapprove, for aesthetic reasons, any material or equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.
  13. All requests for approval of substitutes of materials or other changes from the contract requirements shall be accompanied by an itemized list of all other items affected by such substitution or change. The Architect shall have the right, if such is not done, to rescind any approvals for substitutions and to order such Work removed and replaced with Work conforming to the specified requirements of the contract, all at the Contractor's expense, or to assess all additional costs resulting from the substitution to the Contractor.
  14. Approval of a substitute will not relieve Contractor from the requirement to submit Shop Drawings or any of the provisions of the Contract Documents.
  15. In the event that the Architect is required to provide additional services as a result of a request for approval of a substitute results in changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Architect is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, or for evaluation of deviations from Contract Documents, then the Architect's charges in connection with such additional services shall be paid by the Contractor.
  16. Structural design shown on the Drawings is based upon the configuration of and maximum loading for major items of equipment as indicated on the Drawings and as specified. If the substituted equipment furnished differs from said features, the Contractor shall pay to the Owner all costs of redesign and for any construction changes required to accommodate the equipment furnished, including the Architect's charges in connection therewith.
- B. The Contractor shall respond to required submittals with complete information and with a degree of accuracy to achieve approvals within two (2) submissions. All costs to the Architect involved with subsequent submissions of Shop Drawings, Samples or other items requiring approval, will be paid by the Contractor to the Owner, by deducting such costs from payments due for Work completed. In the event an approved item is requested by the Contractor to be changed or substituted for, all costs involved in the reviewing and approval process will likewise be back charged to the Contractor unless determined by the Architect that the need for such substitution and/or deviation from Contract Documents is beyond the control of the Contractor.

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

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**SECTION 01 2519  
EQUIVALENTS**

**PART 1 GENERAL**

**1.01 SUMMARY:**

- A. Requirements set forth herein pertain to products specified in divisions included in project manual.

**1.02 DEFINITIONS:**

- A. For the purpose of this contract, the words "similar", "equal to", "or equal", "equivalent" and such other words of similar content and meaning, shall be deemed to mean similar and equal to one of named products.
- B. For the purpose of bidding documents, the word "products" shall be deemed to include the words "articles", "materials", "items", "equipment" and "methods". Whenever in contract documents one or more products are specified, words "similar, equivalent, and equal to" shall be deemed inserted.

**1.03 EQUIVALENTS:**

- A. Where, in these specifications or on drawings, certain kinds, types, brands, or manufacturers of materials are named, they shall be regarded as required standard of quality. Where two or more are named these are presumed to be equal, and Contractor may select one of those items.
- B. If Contractor desires to use any kind, type, brand, or manufacturer of material other than those named in specification, he may submit the request for approval to the Architect well in advance of the bid date.
- C. Requests for approval of proposed equivalents will be received by Architect only from the Contractor.
- D. If the Architect approves a proposed equivalent prior to receipt of Bids, such approval will be set forth in an Addendum.
- E. After the bid opening the apparent low bidder or bidders will be notified by the Architect or Owner and shall submit to the Architect in writing, within ten (10) calendar days what equivalent kind, type, brand, or manufacture is included in bid in lieu of specified items. No equivalents will be considered after this submission.
- F. Contractor shall have burden of proving, at Contractor's own cost and expense, to satisfaction of Owner/Architect, that proposed product is similar and equal to named product. In making such determination Owner/Architect will be sole judge of objective and appearance criteria that proposed product must meet in order for it to be approved.
  - 1. Supporting data on equivalency is responsibility of bidder. For each equivalent to base specification, included in products list, submit information describing in specific detail -
    - a. Wherein it differs from quality and performance required by base specification.
    - b. Changes required in other elements of work because of equivalent.
    - c. Effect on construction schedule.
    - d. Any required license fees or royalties.
    - e. Availability of maintenance service, and source of replacement materials.
    - f. Such other information as may be required by Owner.
- G. Owner, through Architect, shall be judge of acceptability of proposed equivalents. Risk of whether bid equivalents will be accepted is borne by Contractor.

**1.04 CONTRACTOR'S REPRESENTATION:**

- A. Submission of an equivalent product and/or material constitutes a representation that Contractor:
    - 1. Has investigated proposed product and determined it is equal to or superior in all respects to that specified.
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2. Will provide same warranties or bonds for equivalent as for product specified.
  3. Will coordinate installation of an accepted equivalent into work and make such other changes as may be required to make work complete in all respects.
  4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.
  5. Will provide, at own cost and expense, any different quantity and/or arrangement of ductwork, piping, wiring, conduit or any part of work from that specified, detailed or indicated in Contract Documents if required for proper installation of an approved equivalent.
  6. Will provide, at own cost and expense, all such revision and redesign and all new drawings and details required by Architect for approval if proposed equivalent product requires a revision or redesign of any part of work covered by this contract.
  7. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
    - a. Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
    - b. Copies of current, independent third-party test data of salient product or system characteristics.
    - c. Samples where applicable or when requested by Architect.
    - d. Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - e. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - f. Research reports, where applicable, evidencing compliance with building code in effect for Project .
    - g. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
  8. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
  9. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.

**1.05 EQUIVALENT CERTIFICATION:**

- A. Contractor must sign the "Equivalent Certification" following this specification section and deliver it to the Architect along with a complete list of proposed equivalents within ten (10) calendar days after notification from the Architect or Owner. This is mandatory and must be done prior to award of contracts.



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**EQUIVALENT CERTIFICATION**

Project Name:
Project Address:
Project No.:

**REVIEWED MATERIAL:**

AIA A701-2018 Instructions to Bidders
AIA A201-2017 or A232(CMa) General Conditions of the Contract
Specification Section: 012519 - Equivalents
Specification Section: 012500 - Substitution Procedures
Specification Section: 016000 - Product Requirements

**CHECK THE FOLLOWING THAT APPLIES:**

<input type="checkbox"/> No equivalents are proposed.
<input type="checkbox"/> Proposed equivalents are attached with supporting data as per Section 012519.

**ALL EQUIVALENTS ARE HEREBY PRESENTED TO ARCHITECT AND OWNER FOR APPROVAL. NO FUTURE EQUIVALENTS WILL BE CONSIDERED.**

Contractor Signature:
Printed Name of Contractor:
Date:

Signature of Reviewer:
Printed Name of Reviewer:
Approved as Noted Date:

**END OF SECTION**



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**SECTION 01 2600**  
**CONTRACT MODIFICATION PROCEDURES****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

**1.02 NO COST CHANGES IN THE WORK**

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on **the Information Bulletin bound in the Project Forms Section of Project Manual.**

**1.03 PROPOSAL REQUESTS**

- A. Owner-Initiated Proposal Requests: **[Architect]** will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by **Architect** are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request, or **10** days when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to **Architect**.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.
  - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times.
  - 6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

**1.04 ALLOWANCES**

- A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
    - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
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2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
  3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
  4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 5 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 5 days after such authorization.
1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
  2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

#### 1.05 ADMINISTRATIVE CHANGE ORDERS

- A. Adjustment from Allowances: Refer to Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Adjustments from Unit Prices: Refer to Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work.

#### 1.06 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, **Architect** will issue a Change Order for signatures of Owner and Contractor on **AIA Document G701-Change Order**.

#### 1.07 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: **Architect** may issue a Construction Change Directive on **the Information Bulletin bound in the Project Forms Section of Project Manual**.
1. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
    - a. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
  2. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
    - a. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION (NOT APPLICABLE)

#### END OF SECTION



**SECTION 01 2900  
PAYMENT PROCEDURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

**1.02 SCHEDULE OF VALUES**

- A. Schedule of Values: Furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
- B. Coordination: Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:
1. Application for Payment forms with continuation sheets. (AIA G702 and G703)
  2. Submittal schedule.
  3. Submit the schedule of values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- C. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the schedule of values.
1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Change Orders (numbers) that affect value.
    - d. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      - 1) Labor.
      - 2) Materials.
      - 3) Equipment.
  3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
  4. **Each school building shall be separately itemized and detailed.**
  5. The following line items must be included on the continuation sheet.
    - a. Project Bonds and Insurances
    - b. Mobilization
    - c. Shop Drawings
    - d. Project Meetings
    - e. Temporary Heat (where applicable)
    - f. Progress Cleaning
    - g. Lawn and Tree Watering (where applicable to establish new lawns and trees)
    - h. Punch List
    - i. Final Cleaning
    - j. Close Out documents and Warranties
  6. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  7. Submit draft of AIA Document G703 Continuation Sheets.
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8. **Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.**
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### 1.03 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
  1. Submit draft copy of Application for Payment **five** days prior to due date for review by Architect. Work to be projected out to the end of the pay period.
- C. Application for Payment Forms: Use **AIA Document G702 and AIA Document G703** as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Incomplete applications will be returned without action.
  1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  4. The OWNER shall retain five percent (5%) of the amount due on each Application for both the work completed and materials stored, unless stated otherwise in Owner Contractor Agreement. The OWNER reserves the right to retain a greater percentage in the event the CONTRACTOR fails to make satisfactory progress or in the event there is other specific cause for greater withholding.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
  1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
- F. **Provide copies of payroll records (including subcontractors) that are signed and notarized, documenting compliance with prevailing wage requirements.**
- G. Transmittal: **Submit three** signed and notarized original copies of each Application for Payment to **Architect** by a method ensuring receipt. Include waivers of lien and similar attachments.



- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
    - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
    - 2. When an application shows completion of an item, submit conditional final or full waivers.
    - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
    - 4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
  - I. Initial Application for Payment: Administrative actions and submittals that must precede submittal of first Application for Payment include the following:
    - 1. List of Substitutions
    - 2. Contractor or Notice to Proceed.
    - 3. Performance and Payment bonds.
    - 4. Liability, Auto, and Umbrella Insurance.
    - 5. Worker Compensation certificates.
    - 6. Proposed schedule of values for approval.
  - J. Initial Application for Payment: Administrative actions and submittals that must coincide with submittal of first Application for Payment include the following:
    - 1. Approved Schedule of values.
    - 2. List of subcontractors.
    - 3. Contractors Safety Program.
    - 4. Contractor's construction schedule (preliminary if not final).
    - 5. Products list (preliminary if not final).
    - 6. Submittal schedule (preliminary if not final).
      - a. First Payment WILL NOT be processed without a Submittal Schedule.
    - 7. Emergency Contacts List.
    - 8. Certified Payroll.
    - 9. Schedule of unit prices.
    - 10. List of Contractor's staff assignments.
    - 11. List of Contractor's principal consultants.
    - 12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
    - 13. Minutes or report of preconstruction conference.
  - K. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
    - 1. Administrative actions and submittals that shall precede or coincide with this application include:
      - a. Occupancy permits and similar approvals
      - b. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion
      - c. Record Drawings and Specifications
      - d. Operations and Maintenance Manuals
      - e. Maintenance Instructions and Training
      - f. Start-up performance reports
      - g. Test/adjust/balance records
      - h. Warranties (guarantees) and maintenance agreements
      - i. Final cleaning
      - j. Change-over information related to Owner's occupancy, use, operation and maintenance
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- k. Application for reduction of retainage and consent of surety
  - l. Advice on shifting insurance coverages
- 2. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
- 3. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Ensure that incomplete Work is not accepted and will be completed without undue delay.
  - 2. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  - 3. Evidence of completion of Project closeout requirements.
  - 4. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  - 5. Updated final statement, accounting for final changes to the Contract Sum.
  - 6. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  - 7. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  - 8. AIA Document G707, "Consent of Surety to Final Payment."
  - 9. Evidence that all claims have been settled.
  - 10. Final liquidated damages settlement statement.
  - 11. Removal of temporary facilities and services.
  - 12. Removal of surplus materials, rubbish, and similar elements.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**



**SECTION 01 3100**  
**PROJECT MANAGEMENT AND COORDINATION****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes administrative provisions for coordinating construction operations including, but not limited to, the following:
  - 1. General project coordination procedures.
  - 2. Administrative and supervisory personnel.
  - 3. Coordination drawings.
  - 4. Requests for Information (RFIs).
  - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

**1.02 DEFINITIONS**

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Use the Architect's Newforma Info Exchange when up loading Submittals.
- B. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use form provided in specification Section 006000 of the Project Manual. Include the following information in tabular form:
  - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- C. Key Personnel Names: Within 5 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
  - 1. Each Contractor to furnish a 24hr. emergency contact person and cellular phone number.
  - 2. Post copies of listing in project meeting room, or field office, and by each field telephone. Keep list current.

**1.04 COORDINATION**

- A. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
    - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
    - 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
    - 3. Make adequate provisions to accommodate items scheduled for later installation.
  - B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
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1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
  2. Preparation of the schedule of values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Preinstallation conferences.
  7. Project closeout activities.
  8. Startup and adjustment of systems.
  9. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

### 1.05 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    - f. Indicate required installation sequences.
    - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work. Provide required information for work sequence to interface with the installation work.
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2. Plenum Space: Indicate sub framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Mechanical and Plumbing Work: Show the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    - c. Fire-rated enclosures around ductwork.
  7. Electrical Work: Show the following:
    - a. Runs of vertical and horizontal conduit 1-1/4 inch diameter and larger.
    - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire alarm locations.
    - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
  8. Fire Protection System: Show the following:
    - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  9. Review areas for required access and indicate the need for access doors for access to shutoffs electrical boxes Etc.
  10. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.
    - a. Failure to provide the required coordination drawings as required by this specification section may result in withholding a portion of the Contractor payment requests until such coordination drawings are received.
  11. Coordination Drawing Prints: Prepare and submit coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."
- C. Architect provides PDF Files: For Projects where Project Building Information Modeling Protocol **(BIM) is NOT executed.**
1. Architect will **not** furnish Contractor with digital drawings for the preparation of coordination drawings.
  2. The Architect will provide digital PDF's of Contract Drawings for the purpose of producing coordination drawings.
    - a. Contract documents are graphic representations of approximate locations of materials. Therefore, information contained within these files should not be assumed to be accurate and users of the Files accept full responsibility for verifying the accuracy and completeness of the Files with field conditions and the contract documents.
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**1.06 REQUESTS FOR INFORMATION (RFI)**

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Do not submit an RFI if information is readily available in the Contract Documents.
    - a. Architect will return with no response RFI's where information is available to the contractor as indicated on the Contract Documents.
  - 2. Architect will return RFI's submitted to Architect by other entities controlled by Contractor with no response.
  - 3. Coordinate and submit RFI's in a prompt manner so as to avoid delays.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
  - 1. Project name.
  - 2. Project number.
  - 3. Date.
  - 4. Name of Contractor.
  - 5. Name of Architect.
  - 6. RFI number, numbered sequentially.
  - 7. RFI subject.
  - 8. Specification Section number and title and related paragraphs, as appropriate.
  - 9. Drawing number and detail references, as appropriate.
  - 10. Field dimensions and conditions, as appropriate.
  - 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  - 12. Contractor's signature.
  - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI's sent without the required content information will not be considered a formal RFI.
- D. RFI Forms: Form provided in specification Section 006000 of the Project Manual, or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
- E. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFI's received by Architect after 1:00 p.m. will be considered as received the following working day.
  - 1. The following RFI's will be refused without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFI's or inaccurately prepared RFI's.
  - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
  - 3. Architect's action on RFI's that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.



**1.07 ARCHITECT'S WEB SITE**

- A. The contractor will use Newforma Info Exchange for Submittals, Shop Drawings and RFI's. Project Web site shall include the following functions:
1. Project directory.
  2. Project correspondence.
  3. Meeting minutes.
  4. Contract modifications forms and logs.
  5. RFI forms and logs.
  6. Task and issue management.
  7. Photo documentation.
  8. Schedule and calendar management.
  9. Submittals forms and logs.
  10. Payment application forms.
  11. Drawing and specification document hosting, viewing, and updating.
  12. Online document collaboration.
  13. Reminder and tracking functions.
  14. Archiving functions.

**1.08 PROJECT MEETINGS**

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times. All Prime Contractors are required to attend Project Meetings.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to all parties, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractors and their superintendents; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to decide matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for project communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Testing and inspecting requirements.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures using Newforma Info Exchange.
    - l. Preparation and updating of record documents.
    - m. Use of the premises.
    - n. Work restrictions.
    - o. Working hours.
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- p. Owner's occupancy requirements and restrictions.
  - q. Responsibility for temporary facilities and controls.
  - r. Procedures for moisture and mold control.
  - s. Procedures for disruptions and shutdowns.
  - t. Construction waste management and recycling.
  - u. Parking availability.
  - v. Office, work, and storage areas.
  - w. Equipment deliveries and priorities.
  - x. First aid.
  - y. Security.
  - z. Progress cleaning.
4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner of scheduled meeting dates.
  - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
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5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Architect will conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
  2. Required Attendees: In addition to representatives of Owner and Architect, each Prime contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to decide matters relating to the Work.
  3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Status of correction of deficient items.
      - 11) Field observations.
      - 12) Status of RFIs.
      - 13) Status of proposal requests.
      - 14) Pending changes.
      - 15) Status of Change Orders.
  4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
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- a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
  - c. Review present and future needs of each contractor present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Work hours.
    - 10) Hazards and risks.
    - 11) Progress cleaning.
    - 12) Quality and work standards.
    - 13) Change Orders.
  3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.
- F. Project Closeout Meeting: Architect will schedule and conduct a Project closeout meeting, at a time convenient to Owner and Contractor, but no later than 30 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  2. Required Attendees: Authorized representatives of Owner, Owner's Commissioning Authority (if applicable), Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation and completion of Contractor's punch list.
    - b. Responsibility for removing temporary facilities and controls.
    - c. Owner's partial occupancy requirements.
    - d. Coordination of separate contracts for owner related work prior to occupancy.
    - e. Installation of Owner's furniture, fixtures, and equipment.
    - f. [Requirements for preparing, completing and submitting sustainable design documentation.]
    - g. Requirements for preparing operations and maintenance data.
    - h. Requirements for the Submittal of written warranties.
    - i. Requirements for demonstration and training.
    - j. Requirements for submission of record documents, record specifications and record submittals.
    - k. Responsibility and schedule for final cleaning
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- I. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**



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**SECTION 01 3200  
CONSTRUCTION PROGRESS DOCUMENTATION****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Start-up construction schedule.
  - 2. Contractor's construction schedule.
  - 3. Daily construction reports.
  - 4. Field condition reports.
  - 5. Special reports.

**1.02 INFORMATIONAL SUBMITTALS**

- A. Format for Submittals: Submit required submittals in the following format[s]:
  - 1. PDF electronic file.
- B. Start-up construction schedule.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- D. Daily Construction Reports: Submit at **weekly** intervals.
- E. Field Condition Reports: Submit at time of discovery of differing conditions.
- F. Special Reports: Submit at time of unusual event.

**1.03 QUALITY ASSURANCE**

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
  - 1. Review software limitations and content and format for reports.
  - 2. Verify availability of qualified personnel needed to develop and update schedule.
  - 3. Discuss phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
  - 4. Review delivery dates for Owner-furnished products.
  - 5. Review schedule for work of Owner's separate contracts.
  - 6. Review time required for review of submittals and resubmittals.
  - 7. Review requirements for tests and inspections by independent testing and inspecting agencies.
  - 8. Review time required for completion and startup procedures.
  - 9. Review and finalize list of construction activities to be included in schedule.
  - 10. Review submittal requirements and procedures.
  - 11. Review procedures for updating schedule.

**1.04 COORDINATION**

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
    - 1. Secure time commitments for performing critical elements of the Work from entities involved.
    - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.
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**PART 2 PRODUCTS****2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL**

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
  - 1. Activity Duration: Define activities and days
  - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  - 4. Startup and Testing Time: Include not less than 15 days for startup and testing.
  - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  - 6. Punch List and Final Completion: Include not more than 30 days for punch list and final completion.
- C. Schedule Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
  - 1. Phasing: Arrange list of activities on schedule by phase.
  - 2. Work under More Than One Contract: Include a separate activity for each contract.
  - 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  - 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  - 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  - 6. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use of premises restrictions.
    - f. Provisions for future construction.
    - g. Seasonal variations.
    - h. Environmental control.
  - 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Submittals.
    - b. Purchases.
    - c. Mockups.
    - d. Sample testing.
    - e. Deliveries.
    - f. Installation.



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- g. Tests and inspections.
    - h. Adjusting.
    - i. Startup and placement into final use and operation.
  - 8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    - a. Structural completion.
    - b. Permanent space enclosure.
    - c. Completion of mechanical installation.
    - d. Completion of electrical installation.
    - e. Substantial Completion.
  - D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and any defined interim milestones.
  - E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
    - 1. Unresolved issues.
    - 2. Unanswered RFIs.
    - 3. Rejected or unreturned submittals.
    - 4. Notations on returned submittals.
  - F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
  - G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

## 2.02 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
    - 1. List of Prime contractors at Project site.
    - 2. List of subcontractors at Project site.
    - 3. Approximate count of personnel at Project site.
    - 4. Equipment at Project site.
    - 5. Material deliveries.
    - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
    - 7. Accidents.
    - 8. Meetings and significant decisions.
    - 9. Unusual events (refer to special reports).
    - 10. Stoppages, delays, shortages, and losses.
    - 11. Meter readings and similar recordings.
    - 12. Emergency procedures.
    - 13. Orders and requests of authorities having jurisdiction.
    - 14. Change Orders received and implemented.
    - 15. Construction Change Directives received and implemented.
    - 16. Services connected and disconnected.
    - 17. Equipment or system tests and startups.
    - 18. Partial completions and occupancies.
    - 19. Substantial Completions authorized.
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- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## **2.03 SPECIAL REPORTS**

- A. General: Submit special reports directly to Owner within **one** day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

## **PART 3 EXECUTION**

### **3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
  - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  - 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
  - 1. Post copies in Project meeting rooms and temporary field offices.
  - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

**END OF SECTION**



**SECTION 01 3300  
SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. This specification describes the procedures for submission of submittals and shop drawings using Newforma Info Exchange.
  - 1. The Contractor will be required to use the Newforma Info Exchange for the transfer of Submittals, Shop Drawings and RFI's. There will be **no exceptions** to this requirement. The contractor will be given a login and password free of charge. For more information follow the procedure below.
    - a. Information and instructions for use are available for review by the contractor by contacting CPL. The Contractor is to provide an email address for the file to be sent. A PDF file will be emailed to the requesting contractor.

**1.02 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

**1.03 DELEGATED-DESIGN SERVICES**

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
  - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

**1.04 SUBMITTAL GENERAL ADMINISTRATIVE REQUIREMENTS**

- A. The Contractor shall prepare a Submittal Log containing the information required to be submitted under the Submittal article from each respective Specification Section. With each item listed the Contractor shall provide anticipated dates for submission to the Architect. The Architect will review and accept or request that corrections be made for subsequent acceptance. This acceptance will constitute an approval for the submittal, shop drawings and sample submissions to commence. **No Submittals or Shop Drawings will be reviewed by the Architect until an approved Submittal Schedule is in place.**



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- B. The contractor shall prepare expected submittals in Newforma that correspond to all submittals listed on the submittal schedule at the time of submission of the submittal log. These expected submittals are to follow the naming conventions laid out in section "1.5 Submittal Schedule" and "1.6 Submittal Identification"
- C. The Contractor is responsible for all costs for creating electronic files for the submittal process. The Architect will not provide this service.
1. The Submittal Cover Sheet located in Specification Section 006000 Project Forms shall be used for all Submittals.
    - a. An electronic form of the submittal cover is available from the Architect.
  2. The Submittal Cover sheet when scanned to a .PDF shall be the first page viewed in the individual file.
    - a. Each product submitted within a specification section shall have a Submittal Cover sheet attached. Combined submittals with one cover page will not be accepted
    - b. Each Submittal Cover sheet shall be filled in completely. **Files that are sent with the Submittal Cover Sheet missing or not filled in correctly will not be reviewed.** The Architect will send a notice that the submittal is missing information. If the Contractor fails to correct or provide the proper submittal within 15 days, notice will be provided, and the submittal will be REJECTED.
  3. The Contractor(s) will be provided with a link to upload files to the Newforma Info Exchange. The site address and a "log in" will be provided to the Contractor(s) free of charge.
  4. A read only Record Submittal Log and RFI Log will be available from the Newforma Info Exchange for the Contractors reference in checking the status of the submittals and shop drawings.
- D. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittals of different types of submittals from related section for parts of the work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received. Delays associated with the above are the not the Architects responsibility and rests solely with the Contractor.
- E. Architect's Digital Data Files: For Projects where Project Building Information Modeling Protocol is NOT executed. Provide digital PDF's only.
1. Architect will not furnish Contractor with digital drawings for the preparation of shop drawings.
  2. The Architect will provide digital PDF's of Contract Drawings for the purpose of producing project record drawings.
    - a. Contract documents are graphic representations of approximate locations of materials. Therefore, information contained within these files should not be assumed to be accurate and users of the Files accept full responsibility for verifying the accuracy and completeness of the Files with field conditions and the contract documents.
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3. [Document Transfer Agreement - For Projects where Architect's work files are not a deliverable: The Contractor shall execute an Electronic Document Transfer Agreement for all electronic transfers of files, other than PDFs. The contractor must provide acknowledgement, accept the information regarding drawings, ownership and Limitations of Liability. Agreement is found with Project Forms.
  - a. The following plot files will be furnished for each appropriate discipline:
    - 1) Floor plans.
    - 2) Reflected ceiling plans.

#### **1.05 SUBMITTAL SCHEDULE**

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
  1. Submit a preliminary if not final Submittal Schedule for approval a minimum of 15 days after award of contract. Failure to submit a submittal schedule within the required time frame will result in the refusal by the Architect to review any submittals. Delays associated with failure to receive the Submittal Schedule are the not the Architects responsibly and rest solely with the Contractor.
- B. The information is required to be submitted under the Submittal article from each respective Specification Section. With each item listed the Contractor shall provide anticipated dates for submission to the Architect. The Architect will review and accept or request that corrections be made for subsequent acceptance. This acceptance will constitute a review for the submittal, shop drawings and sample submissions may commence. No Submittals or Shop Drawings will be reviewed by the Architect until an approved Submittal Schedule is in place.
  1. The Submittal Schedule shall be coordinated with the overall Project Schedule to ensure that submittals are submitted and reviewed so as not to delay the Project Schedule.
  2. The Architect will not be responsible for ensuring that all required Shop Drawings, Product Data, Samples or similar submittals that are required to be submitted and reviewed under the Contract Documents are submitted by the Contractor. Submissions of Shop Drawings, Product Data, Samples or similar submittals are the Contractor's sole responsibility. Delays associated with the contractor's failure to provide the required submittals are the Contractors responsibility.
  3. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  4. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 30 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  5. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
  6. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal Category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's [ and Construction Manager's] final release or approval.
    - g. Scheduled dates for purchasing.
    - h. Scheduled date of fabrication.



- i. Scheduled dates for installation.

#### 1.06 SUBMITTAL IDENTIFICATION

- A. Submittal Cover Sheet: Attach one cover sheet for each product, shop drawing or sample. DO NOT combine submittals together with one cover sheet for multiple items. They will not be reviewed.
- B. Submittal Information: Include the following information in each submittal. Use the submittal cover form found in specification section 006000 Project Forms. An electronic form can be sent to the contractor upon request
1. Contractor, Address, Phone/fax and or Email
  2. Contractors Submittal Number.
  3. Architects Project Number.
  4. Project Name (if not filled in by the Architect)
  5. Type of submittal being sent (select box)
  6. Product Identification including the following: Provide one submittal cover sheet for each product within a specification section
    - a. Specification Section Number
    - b. Contract Drawing Number
    - c. Product Name
    - d. Specification Reference: Part/Paragraph
    - e. Detail Reference
    - f. Manufacturer
  7. Contractors Approval: The contractor must acknowledge that they have reviewed the submittal for conformance with the Contract Documents and must sign and date the approval.
  8. Deviation from the Contract Documents: Where the submittal may not meet all of the requirements of the specified item. The contractor must indicate how the submitted item differs from the specified item.
  9. Contractor Comments: Any additional comments by the contractor should be indicated in this space. (Provide an attachment sheet for any other information required that will not fit on the cover sheet.)
- C. Deviations and Additional Information: On each individual submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information, revisions, line by line comparison and other information requested by Architect [ and Construction Manager]. Indicate by highlighting on each submittal or noting on attached separate sheet. Identify options requiring selection by Architect.
- D. File Naming (for uploading): Each submittal or shop drawing file uploaded to the project on the Newforma Info Exchange, shall have in the file name, the specification section number followed by the submittal number, the submittal abbreviation and the specification section name. For re-submissions an R1 would be added following submittal number. The file name must include the following information:

Example:

081416	001	PD	Flush Wood Doors
Spec Section	Submittal No.	Submittal Abbr	Specification Name

File to Read: 081416-001 PD - Flush Wood Doors

Re-submission to Read:081416-001-R1-Flush Wood Doors

Submittal Abbr. required to be used in the file name on submittals are as follows:

CD - Coordination Drawings

CERT - Certification(s)



CLC - Calculations  
DD - Design Data  
EJ - Engineer's Judgement  
LEED - LEED or PD/LEED  
O&M - Operations and Maintenance Manuals  
PD - Product Data  
PHOTO - Photo  
QD - Qualification Data  
RPT - Report  
SAMP - Sample  
SCH - Schedule  
SEL - Make A Selection  
SD - Shop Drawing(s)  
STDY - Study  
TR - Test Results  
WAR - Warranty

- E. When uploading submittals or RFI's to the Newforma Info Exchange, complete the online transmittal. The information required is derived from the contractor's submittal cover sheet or RFI. Instructions using the Newforma Info Exchange are available from CPL. These instructions can be emailed to the contractor.

#### **1.07 SUBMITTAL DATA AND TESTING REQUIREMENTS**

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment. Each product within a specification section shall have a separate submittal cover.
1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable. Send full submittals for each product. Partial submittals will not be reviewed until all required submittal information is received. The architect will not be responsible for project delays due to the contractor's failure to submit the required submittal information in a complete package.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams that show factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
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5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
  - B. Shop Drawings: Prepare project-specific information for each shop drawing. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data [ unless submittal based on Architect's digital data drawing files is otherwise permitted].
    1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      - a. Identification of products.
      - b. Schedules.
      - c. Compliance with specified standards.
      - d. Notation of coordination requirements.
      - e. Notation of dimensions established by field measurement.
      - f. Relationship and attachment to adjoining construction clearly indicated.
      - g. Description any conflicts with other trades.
      - h. Seal and signature of professional engineer if specified.
    2. BIM Incorporation: When Project uses BIM through the Construction Stage and Contractor is required to prepare Shop Drawings for incorporation into the BIM. Revise as required to reflect Project scope agreements. [Develop and Incorporate] [Construction Manager will incorporate Contractor's] shop drawings and data files into BIM established for Project.
      - a. Prepare design drawings and data files in the following format - Refer to these executed AIA Documents – required for BIM incorporation;
        - 1) AIA Document G201 – 2013 Project Digital Data Protocol Form
        - 2) AIA Document G202 – 2013 Project Building Information Modeling Protocol Form
        - 3) AIA Document E203–2013, Building Information Modeling and Digital Data Exhibit
      - b. Refer to Section 013100 "Project Management and Coordination" for requirements for coordination drawings.]]
  - C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
    1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package. If samples are delivered with product data, only the samples will be reviewed. The Product Data must be uploaded to the Newforma Info Exchange. A duplicate submittal cover sheet is to be uploaded to the Newforma Info exchange as a record of sample delivery.
      - a. The Product Data is to be loaded concurrent with the delivery of samples. Samples may be delivered/given to the Architect. In the remarks column of the transmittal place "given to the Architect"
    2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
      - a. Project name and submittal number.
      - b. Generic description of Sample.
      - c. Product name and name of manufacturer.
      - d. Sample source.
      - e. Number and title of applicable Specification Section.
      - f. Specification paragraph number and generic name of each item.
      - g. In addition to all hard copy and physical samples submitted, duplicate digital submittal is to be produced for review, record and tracking purposes through Newforma Info Exchange. Include same information as above as well as a high resolution, color, digital image of all samples with labeled information clearly visible for each physical sample.
    3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
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- a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit [one] or Insert number full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect [, through Construction Manager,] will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit [three] or Insert number sets of Samples. Architect [ and Construction Manager] will retain [two] or Insert number Sample sets; remainder will be returned. [ Mark up and retain one returned Sample set as a project record Sample.]
      - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least [three] or Insert number sets of paired units that show approximate limits of variations.
- D. Information requirements for each submittal: Where submittal is requiring Schedules, Product Data, Qualification Data, Design Data, Certificates and Tests use the following protocol.
  1. Schedules: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  2. Product Data. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
    - a. Manufacturer and product name, and model number if applicable.
    - b. Number and name of room or space.
    - c. Location within room or space.
  3. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
  4. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
  5. Certificates:
    - a. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
    - b. Insert definition of Contractor certificates here if required by individual Specification Sections. See the Evaluations.



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- c. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
  - d. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
  - e. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
  - f. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
  - g. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
  - h. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
  - i. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
  - j. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
  - k. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
6. Test and Research Reports:
- a. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
  - b. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
  - c. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
  - d. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
  - e. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
  - f. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
    - 1) Name of evaluation organization.
    - 2) Date of evaluation.
    - 3) Time period when report is in effect.
    - 4) Product and manufacturers' names.
    - 5) Description of product.
    - 6) Test procedures and results.
    - 7) Limitations of use.

E. Submit the following submittals: Within 15 days of contract award.

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1. Submittal Schedule including dates of anticipated review and approval.
    - a. No submittals will be reviewed without an approved Submittal Schedule in place.
  2. Subcontractor List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
    - a. Name, address, telephone number and email address of entities performing subcontract or supplying products.
    - b. Number and title of related Specification Section(s) covered by subcontract.
  3. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
  4. Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- F. Submit with in the first 30 days after Contract Award
1. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014329 "Special Inspections."
  2. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
  3. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- G. Submit Field Test Reports during construction within 15 days of the testing date and as follows:
1. Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- H. Submit a minimum 30 days prior to Project Closeout:
1. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
  2. Maintenance Data: Comply with requirements specified in Division 01 Section 017823 "Operation and Maintenance Data."

#### **1.08 SUBMITTAL PROCESSING**

- A. Processing Time: Allow time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
  - B. The architect will not be responsible for project delays due to the contractor's failure to submit the required submittal information in time to allow for review based on the stipulated review time and to meet the project schedule.
  - C. Initial Review: Allow 10 Calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - D. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - E. Re-submittal Review: Allow 10 Calendar days for review of each re-submittal.
  - F. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 Calendar days for initial review of each submittal.
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- G. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 Calendar days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- H. Where submittal are required to be approved that are part of an assembly or for items such as finishes where color selections are required. The submittal will be retained until all of the information related to these systems and color selections is provided and accepted.
- I. Products with multiple submittals may be held until all necessary information has been submitted for architect to make a complete review. Submittals dependent on coordinating information from related or dependent products; or products with critical interface with other products may be held until all information is submitted for architect to make a complete review and coordinate all required information. (example door frames will not be reviewed without door hardware)
- J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
  - 3. Resubmit submittals until they are marked with reviewed notation from Architect's [ and Construction Manager's] action stamp.
- K. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

#### **1.09 SUBMITTAL PROCEDURES**

- A. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
  - B. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
  - C. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
  - D. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
  - E. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
  - F. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
  - G. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
  - H. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
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- I. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.
  - 6. Test procedures and results.
  - 7. Limitations of use.
- J. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- K. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- L. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- M. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- N. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- O. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

#### **1.10 CONTRACTOR'S REVIEW**

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractors Approval: Provide Contractor's approval signature and date on the Submittal Cover sheet certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### **1.11 ARCHITECT'S ACTION**

- A. Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will respond to each submittal indicating one of the following actions required:
  - 1. No Exceptions Taken: Architect takes no exception to the submittal. This part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
  - 2. Furnish as Corrected: No exceptions taken except what is identified by the Architect. The part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance. Furnish any additional related information as requested.



3. Revise and Re-Submit: Revise the submittal based on the Architects comments and resubmit the submittal. Do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
    - a. Do not permit submittals marked "Revise and Resubmit" to be used at the Project Site, or elsewhere where Work is in progress.
  4. Rejected: The submittal is rejected. See Architects comments on why submittal was rejected.
    - a. Submittal has not been reviewed by the Contractor and so noted.
    - b. Submittal has been prepared without due regard for information called for or logically implied by the Contract Documents.
    - c. Information is not sufficiently complete or accurate to verify that work represented is in accordance with the Contract Documents.
    - d. Do not permit submittals marked "Rejected" to be used at the Project Site, or elsewhere where Work is in progress.
  5. No Action Taken: The submittal is not required and will not be reviewed.
- B. Submittals by Newforma Info Exchange: Architect [ and Construction Manager] will indicate, on Newforma Info Exchange, the appropriate action.
  - C. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. The Architects action will be noted in the Newforma Info Exchange.
  - D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect. The Architects action will be noted in the Newforma Info Exchange and noted as a partial review until a full submittal can be received.
  - E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for re-submittal without review.
  - F. Submittals not required by the Contract Documents will not be reviewed and will receive no action.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



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**SECTION 01 4000  
QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

**1.02 DEFINITIONS**

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
  - B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
  - C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
    - 1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
    - 2. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
  - D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
  - E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
  - F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
  - G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
  - H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
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- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

### **1.03 DELEGATED-DESIGN SERVICES**

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
  - 1. The design professional shall be licensed to perform professional design services in the jurisdiction of the project location.

### **1.04 CONFLICTING REQUIREMENTS**

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

### **1.05 ACTION SUBMITTALS**

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
  - 1. Indicate manufacturer and model number of individual components.
  - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

### **1.06 INFORMATIONAL SUBMITTALS**

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
    - 1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.
    - 2. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.
  - B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
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- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
  2. Entity responsible for performing tests and inspections.
  3. Description of test and inspection.
  4. Identification of applicable standards.
  5. Identification of test and inspection methods.
  6. Number of tests and inspections required.
  7. Time schedule or time span for tests and inspections.
  8. Requirements for obtaining samples.
  9. Unique characteristics of each quality-control service.

#### **1.07 REPORTS AND DOCUMENTS**

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
  2. Project title and number.
  3. Name, address, and telephone number of testing agency.
  4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and re-inspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
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- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.08 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm with **5** years experience in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm with **5** years experience in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual with **5** years experience in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.



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- d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
  - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
  - f. When testing is complete, remove test specimens, assemblies, mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
- 1. Build mockups in location indicated or, if not indicated, as directed by Architect.
  - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
  - 3. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
  - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 5. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.
    - a. Allow seven days for initial review and each re-review of each mockup.
  - 6. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
  - 7. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 8. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 9. Demolish and remove mockups when directed unless otherwise indicated.

#### **1.09 QUALITY CONTROL**

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
- 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
- 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
  - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
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6. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  - C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
  - D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
  - E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
  - F. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
    1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
    2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
    3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
    4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
    5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
    6. Do not perform any duties of Contractor.
  - G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
    1. Access to the Work.
    2. Incidental labor and facilities necessary to facilitate tests and inspections.
    3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
    4. Facilities for storage and field curing of test samples.
    5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
    6. Security and protection for samples and for testing and inspecting equipment at Project site.
  - H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
    1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### **1.10 QUALITY-CONTROL PLAN**

- A. Contractor's Quality-Control Plan, The Contractor shall submit quality-control plan within 10 days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.
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- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
  - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
  - 3. Owner-performed tests and inspections indicated in the Contract Document, including tests and inspections indicated to be performed by Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

#### 1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: **Owner will engage** a qualified **testing agency / special inspector** to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
  - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
  - 2. Notifying Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, Owner, and Commissioning Authority, with copy to Contractor and to authorities having jurisdiction.
  - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  - 6. Retesting and re-inspecting corrected work.

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION

##### 3.01 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
    - 1. Date test or inspection was conducted.
    - 2. Description of the Work tested or inspected.
    - 3. Date test or inspection results were transmitted to Architect.
    - 4. Identification of testing agency or special inspector conducting test or inspection.
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- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's and Owner's reference during normal working hours.

### **3.02 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF SECTION**



**SECTION 01 4119  
REGULATORY REQUIREMENTS - NYS EDUCATION DEPARTMENT****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes:
  - 1. "Uniform Safety Standards for School Construction and Maintenance Projects" for maintaining a Certificate of Occupancy during construction.

**1.02 REFERENCES**

- A. Section 155.5 of the Regulations of the New York State Commissioner of Education "Uniform Safety Standards for School Construction and Maintenance Projects".

**PART 2 PRODUCTS (NOT APPLICABLE)****PART 3 EXECUTION****3.01 GENERAL REQUIREMENT**

- A. The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy.

**3.02 HAZARDOUS BUILDING MATERIALS**

- A. Surfaces that will be disturbed during renovation or demolition have been tested for lead and asbestos. Results of the testing are available, upon request, from the Owner.

**3.03 GENERAL SAFETY AND SECURITY STANDARDS FOR CONSTRUCTION**

- A. General safety and security standards for construction projects include the following:
  - 1. All construction materials shall be stored in a safe and secure manner.
  - 2. Fences around construction supplies or debris shall be maintained.
  - 3. Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.
  - 4. During exterior renovation work, overhead protection shall be provided for any sidewalks or areas immediately beneath the work site or such areas shall be fenced off and provided with warning signs to prevent entry.
  - 5. Workers shall be required to wear photo-identification badges at all times for identification and security purposes while working at occupied sites.

**3.04 SEPARATION OF CONSTRUCTION AREAS FROM OCCUPIED AREAS**

- A. Construction areas which are under the control of a contractor and therefore not occupied by district staff or students shall be separated from occupied areas. Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the building. Periodic inspection and repairs of the containment barriers must be made to prevent exposure to dust or contaminants. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.
    - 1. A specific stairwell and/or elevator should be assigned for construction worker use during work hours. In general, workers may not use corridors, stairs or elevators designated for students or school staff.
    - 2. Large amounts of debris must be removed by using enclosed chutes or a similar sealed system. There shall be no movement of debris through halls of occupied spaces of the building. No material shall be dropped or thrown outside the walls of the building.
    - 3. All occupied parts of the building affected by renovation activity shall be cleaned at the close of each workday. School buildings occupied during a construction project shall maintain required health, safety and educational capabilities at all times that classes are in session."
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## REGULATORY REQUIREMENTS

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- NYS EDUCATION  
DEPARTMENT01 4119 2

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**3.05 MAINTAINING EXITING DURING CONSTRUCTION**

- A. The Contractor will prepare a plan detailing how exiting required by the applicable building code will be maintained during construction. The plan shall indicate temporary construction required to isolate construction equipment, materials, people, dust, fumes, odors, and noise during the construction period. Temporary construction details shall meet code-required fire ratings for separation and corridor enclosure. At a minimum, required exits, temporary stairs, ramps, exit signs, and door hardware shall be provided at all times.

**3.06 MAINTAINING VENTILATION DURING CONSTRUCTION**

- A. The Contractor will prepare a plan detailing how adequate ventilation will be maintained during construction. The plan shall indicate ductwork that must be rerouted, disconnected, or capped in order to prevent contaminants from the construction area from entering the occupied areas of the building. The plan shall also indicate how required ventilation to occupied spaces affected by the construction will be maintained during the project.

**3.07 NOISE ABATEMENT DURING CONSTRUCTION**

- A. Construction and maintenance operations shall not produce noise in excess of 60 dba in occupied spaces or shall be scheduled for times when the building or affected building spaces are not occupied or acoustical abatement measures shall be taken
- B. Noise level measurements (dba) shall be taken with a type 2 sound level meter in the occupied space in a location closest to the source of noise.
- C. Each prime contractor shall have a type 2 sound level meter available on the project site at all times for use by the architect/engineer for the entire duration of the construction project.

**3.08 CONTROL OF CHEMICAL FUMES, GASES AND OTHER CONTAMINANTS DURING CONSTRUCTION**

- A. The contractor shall be responsible for the control of chemical fumes, gases, and other contaminants produced by, including but not limited to, welding, gasoline or diesel engines, roofing, paving, or painting, to ensure they do not enter occupied portions of the building or air intakes.
  - 1. Contractors shall provide a plan indicating how and where welding, gasoline engine, roofing, paving, painting or other fumes will be exhausted from the work site. Contractors shall provide all temporary means to assure that fresh air intakes do not draw in such fumes.
  - 2. If any portion of the work will generate toxic gases that cannot be contained in an isolated area, the work shall be done when school classes and programs are not in session. The contractor shall include costs associated with this requirement in his bid. The building shall be properly ventilated and, the material shall be given proper time, as recommended by the manufacturer, to cure "off-gas" before re-occupancy.
  - 3. The contractor shall maintain all manufacturers' Material Safety Data Sheets (MSDS) at the site for all products used in the project. Copies of the MSDS sheets shall be given to the Architect and to the School District. MSDS sheets shall be provided to anyone who requests them.

**3.09 CONTROL OF OFF-GASSING DURING CONSTRUCTION**

- A. The contractor shall be responsible to ensure that activities and materials which result in "off-gassing" of volatile organic compounds such as glues, paints, furniture, carpeting, wall covering, drapery, etc. are scheduled, cured or ventilated in accordance with manufacturers recommendations before a space can be occupied.
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1. Contractor shall provide, in their schedules for work of the construction, proper time for "off-gassing" or volatile organic compounds introduced during construction before occupancy is allowed. Specific attention is warranted for activities including glues, adhesives, paint, furniture, carpeting, wall coverings, and drapery. Manufacturers shall be contacted to obtain information regarding appropriate temperatures and times needed to cure or ventilate the product during use and before safe occupancy of the space can be assured. The contractor shall include the above-mentioned information and shall clearly highlight the information, as part of the shop drawing submittal.
2. Building materials or furnishings which "off-gas" chemical fumes, gases, or other contaminants shall be aired out in a well ventilated heated warehouse before it is brought to the project for installation or, the manufacturer's recommended "off-gassing" periods must be scheduled between installation and use of the space.
3. The contractor shall maintain all manufacturers' Material Safety Data Sheets (MSDS) at the site for all products used in the project. Copies of the MSDS sheets shall be given to the Architect and to the School District. MSDS sheets shall be provided to anyone who requests them.

**3.10 ASBESTOS-CONTAINING BUILDING MATERIALS**

- A. Large and small asbestos abatement projects as defined by 12NYCRR56 shall not be performed while the building is occupied. The term "building", as referenced in this section, means a wing or major section of a building that can be completely isolated from the rest of the building with sealed noncombustible construction. The isolated portion of the building must contain exits that do not pass through the occupied portion and ventilation systems must be physically separated and sealed at the isolation barrier.
- B. Exterior work such as roofing, flashing, siding, or soffit work may be performed on occupied buildings provided proper variances are in place as required, and complete isolation of ventilation systems and at windows is provided. Care must be taken to schedule work so that classes are not disrupted by noise or visual distraction.
- C. For clearance sampling, the air sampling technician shall provide aggressive air sampling per Rule 56 and as follows: First direct the exhaust of a leaf blower, against all walls, ceilings, floors, ledges, and other surfaces in the work area. Continue agitation for at least five minutes per every 1,000 sf of floor space. Following this aggressive agitation, the air-sampling technician shall use at least one 20-inch fan per 10,000 cubic feet of work area space for continuous agitation. The fan shall be operated on low speed and pointed toward the ceiling. Sampling pumps shall be started after the fans are started and stopped before the fans are stopped.
  1. Samples shall be logged on a permanently bound logbook at the laboratory. No whiteout will be used to make corrections.
  2. All lab counts, data and analysis shall be recorded on a lab summary sheet for each sample.
  3. Per the requirements of the New York State Education Department all Final Air Clearance Samples shall be (TEM) Transmission Electron Microscopy methodology.

**3.11 LEAD-CONTAINING BUILDING MATERIALS**

- A. Surfaces that will be disturbed by reconstruction have been tested for the present of lead based paint materials. This information is provided in order that proper measures are taken, to train and protect workers per OSHA regulations. Refer to Division 0 Existing Hazardous Material Information for testing results.
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- B. Projects which disturb surfaces that contain lead shall have in the specifications a plan prepared by a certified Lead Risk Assessor or Supervisor which details provisions for occupant protection, worksite preparation, work methods, cleaning and clearance testing which are in general accordance with the HUD Guidelines.

**END OF SECTION**



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**SECTION 01 4120  
WORK RESTRICTIONS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

**1.02 USE OF PREMISES**

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
  - 1. Owner Occupancy: Allow for Owner occupancy of the entire site and building. The Owner's educational programs shall continue throughout the duration of construction. No work shall be done while school is in session.
  - 2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

**1.03 OCCUPANCY REQUIREMENTS**

- A. Full Owner Occupancy: Owner will occupy site and existing buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.
- B. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of all buildings, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
  - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
  - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
  - 3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building.
  - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



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**SECTION 01 4200**  
**REFERENCES**

**PART 1 GENERAL**

**1.01 KEY DEFINITIONS**

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

**1.02 DEFINITIONS**

- A. Air Handling Unit: A blower or fan used for the purpose of distributing supply air to a room, space or area.
  - B. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved according to the requirements established in this Section and as required by the Code Official having jurisdiction over this project.
  - C. Architect: Other terms including "Architect/Engineer" and "Engineer" have the same meaning as "Architect".
  - D. Company Field Adviser: An employee of the Company which lists and markets the primary components of the system under the name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation, and servicing of the required products. Personnel involved solely in sales do not qualify.
  - E. Concealed Location: A location that cannot be accessed without damaging permanent parts of the building structure or finish surface. Spaces above, below or behind readily removable panels or doors shall not be considered as concealed.
  - F. Concealed Piping: Piping that is located in a concealed location. (See "concealed location".)
  - G. Connect: A term contraction and unless otherwise specifically noted is to mean "The labor and materials necessary to join or attach equipment, materials or systems to perform the functions intended".
  - H. Construction Manager: **Triton Construction.**
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- I. Drain: Any pipe that carries wastewater or water-borne wastes in a building drainage system.
  - J. Drainage Fittings: Type of fitting or fittings utilized in the drainage system. Drainage fittings are similar to cast-iron fittings, except that instead of having a bell and spigot, drainage fittings are recessed and tapped to eliminate ridges on the inside of the installed pipe.
  - K. Drainage System: Piping within a public or private premise that conveys sewage, rainwater or other liquid wastes to a point of disposal. A drainage system does not include the mains of a public sewer system or a private or public sewage treatment or disposal plant.
    - 1. Building Gravity: A drainage system that drains by gravity into the building sewer.
    - 2. Sanitary: A drainage system that carries sewage and excludes storm, surface and ground water.
    - 3. Storm: A drainage system that carries rainwater, surface water, condensate, cooling water or similar liquid wastes.
  - L. Duct: A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.
  - M. Duct System: A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.
  - N. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
  - O. Headroom: Minimum clearance between the floor and the underside of the point of lowest installed mechanical construction above. In case of stairways and walkways, the minimum clearance between the step or surface of the walkway and the lowest installed mechanical construction above the stairway or the walkway.
  - P. Include: When used in any form other than "inclusive", is non-limiting and is not intended to mean "all-inclusive."
  - Q. Indicated: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
  - R. Inspection Certificate: Identification applied on a product by an approved agency containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an approved agency that indicates that the product or material has been inspected and evaluated by an approved agency.
  - S. Installer: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
    - 1. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
    - 2. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
    - 3. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
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- T. Label: An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency.
- U. Location:
1. Damp Location: Partially protected locations under canopies, marquees, roofed open porches and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns and some cold-storage warehouses.
  2. Dry Location: A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.
  3. Wet Location: Installations underground or in concrete slabs or masonry in direct contact with the earth and locations subject to saturation with water or other liquids, such as vehicle-washing areas, and locations exposed to weather and unprotected.
- V. Manufacturer's Designation: Identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection Certificate," "Label" and "Mark").
- W. Mark: An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection Certificate," "Label" and "Manufacturer's Designation").
- X. Mechanical: Other terms including "HVAC", "Plumbing", "Sprinkler", "Laboratory Equipment", "Food Service Equipment", "Laundry Equipment", and "Refrigeration" have the same meaning as "Mechanical".
- Y. Owner: Poughkeepsie City School District
- Z. Piping: This term includes pipe, tube and appurtenant fittings, flanges, valves, traps, hangers and supports.
- AA. Piping, Concealed: Piping built into construction and not accessible without removal of construction Work such as masonry, plaster or other finish material, and piping installed in floors, furred spaces, suspended ceilings, non-walk-in tunnels, conduits, and behind removable panels and cabinet doors.
- BB. Piping, Distribution: Domestic water supply piping, starting with a connection to service piping, and continuing throughout the building to point of connection to equipment and fixture supply piping.
- CC. Piping, Exposed: Piping directly accessible by normal accesses without removal of any construction Work or material.
- DD. Piping, Service: Underground domestic water supply piping with a connection to a water main or supply as noted, and continuing to and into a building and terminating with the exposed fitting inside the building.
- EE. Piping, Tunnel: Piping installed in walk-in or non-walk-in tunnels or conduits up to first shut-off valve inside building.
- FF. Plumbing System: Includes the water supply and distribution pipes; plumbing fixtures and traps; water-treating or water-using equipment; soil, waste and vent pipes; and sanitary and storm sewers and building drains, in addition to their respective connections, devices and appurtenances within a structure or premises.
- GG. Product: As used includes materials, systems and equipment.
- HH. Registered Design Professional: An individual who is a registered architect (RA) in accordance with Article 147 of the New York State Education Law or a licensed professional engineer (PE) in accordance with Article 145 of the New York State Education Law.
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- II. Space, Finished: A space which has a finishing material applied to walls or ceilings, such as paint, plaster, ceramic tile, enamel glazing, face brick, vinyl wall covering, etc. to provide a finished appearance or which will have such finishes applied under a related Contract.
- JJ. Space, Unfinished: A space which does not meet the definition of a finished space.
- KK. Special Inspection: Inspection as herein required of the materials, installation, fabrication, erection, or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards.
- LL. Steam-Heating Boiler: A boiler operated at pressures not exceeding 15 psi for steam.
- MM. Supplier: Any person or organization who supplies materials or equipment for the work, including that fabricated to a special design.
- NN. Utility: Any gas, steam, water, sanitary sewer, storm sewer, electrical or other such service.
- OO. Water Supply System: The water service pipe, water distribution pipes, and the necessary connecting pipes, fittings, control valves and all appurtenances in or adjacent to the structure or premises.
  - 1. Chilled: Water-cooled by refrigeration.
  - 2. Cold: Water with at temperature between 33 degrees F and 80 degrees F and which is neither cooled nor heated mechanically.
  - 3. Domestic: Water for use in buildings, except water used in connection with space heating and space cooling.
  - 4. High Temperature: Water with a supply water temperature above 350 degrees.
  - 5. Hot: Water at a temperature greater than or equal to 110°F.

### 1.03 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
  - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.04 ABBREVIATIONS AND ACRONYMS

A.

AA	Aluminum Association, Inc. (The)
AABC	Associated Air Balance Council



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AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	ACI International (American Concrete Institute)
ACPA	American Concrete Pipe Association
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (part of CPA)
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
ARI	Air-Conditioning & Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International

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ASSE	American Society of Sanitary Engineering
ASTM	ASTM International
AWCMA	American Window Covering Manufacturers Association (WCSC)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
CBM	Certified Ballast Manufacturers
CCC	Carpet Cushion Council
CDA	Copper Development Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CTI	Cooling Technology Institute
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance

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EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association
FM Approvals	Factory Mutual Approvals
FSA	Fluid Sealing Association
GA	Gypsum Association
GANA	Glass Association of North America
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association
HPVA	Hardwood Plywood & Veneer Association
ICEA	Insulated Cable Engineers Association, Inc
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IENT	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
IPCEA	Insulated Power Cable Engineer Associates

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ISO	International Organization for Standardization
ISSFA	International Solid Surface Fabricators Association
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LEED	Leadership in Energy and Environmental Design
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International
NADCA	National Air Duct Cleaners Association
NAIMA	North American Insulation Manufacturers Association
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association

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NETA	National Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NWWDA	National Wood Window and Door Association (WDMA)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
SAE	SAE International
SDI	Steel Deck Institute

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SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc.

#### 1.05 FEDERAL GOVERNMENT AGENCIES:

- A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
DOD	Department of Defense



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DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FDA	Food and Drug Administration
GSA	General Services Administration
HUD	Department of Housing and Urban Development
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
PHS	Office of Public Health and Science
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

- B. Codes, Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines
BCNYS	Building Code of New York State
CFR	Code of Federal Regulations
DOD	Department of Defense Military Specifications and Standards
FS	Federal Specification
MILSPEC	Military Specification and Standards

#### 1.06 NEW YORK STATE GOVERNMENT AGENCIES:

- A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
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DASNY	Dormitory Authority of the State of New York
DEC	Department of Environmental Conservation
DHCR	Division of Housing and Community Renewal
DOH	Department of Health
NYSDOL	New York State Department of Labor
DOS	Department of State
DOT	Department of Transportation
NYSPA	New York State Power Authority
OGS	Office of General Services
OCFS	Office of Children and Family Services
OMRD	Office of Mental Retardation and Developmental Disabilities
OPRHP	Office of Parks, Recreation and Historic Preservation
NYSED	New York State Education Department (Department of Education)
SHPO	State Historic Preservation Office
SUCF	State University Construction Fund
SUNY	State University of New York

#### 1.07 NEW YORK STATE CODES

- A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. BCNYS Building Code of New York State
  2. 9-NYCRR New York State Dept. of Labor Title 9 State Building Code
  3. 10-NYCRR New York State Dept. of Labor Title 10 State Hospital Code
  4. 19-NYCRR Charter XXXIII, Sub Charter A, Uniform Fire Prevention and Building Code
- B. Where these abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. BCNYS Building Code of New York State
  2. ECCNYS Energy Conservation Code of New York State
  3. PCNYS Plumbing Code of New York State of New York State
  4. MCNYS Mechanical Code of New York State
  5. FGCNYS Fuel Gas Code of New York State



6. FCNYS Fire Code of New York State

**1.08 OTHER TERMS OR ACRONYMS:**

- A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name in the following list.
  1. Asbestos Containing Materials
  2. Acoustical Tile
  3. Infection Control Risk Assessment
  4. Resilient Vinyl Tile
  5. Suspended Acoustical Tile
  6. Spray on Fire Resistive Materials
  7. Thermal Systems Insulation
  8. Vinyl Asbestos Tile
  9. Vinyl Composition Tile

**1.09 OTHER TERMS OR ACRONYMS:**

- A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name in the following list.
  - a. Asbestos Containing Materials
  - b. Acoustical Tile
  - c. Infection Control Risk Assessment
  - d. Resilient Vinyl Tile
  - e. Suspended Acoustical Tile
  - f. Spray on Fire Resistive Materials
  - g. Thermal Systems Insulation
  - h. Vinyl Asbestos Tile
  - i. Vinyl Composition Tile

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION (NOT APPLICABLE)**

**END OF SECTION**



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STATEMENT OF SPECIAL  
INSPECTIONS AND TESTS  
COVER

**SECTION 01 4534**  
**STATEMENT OF SPECIAL INSPECTIONS AND TESTS COVER**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Attached is NYS Education Department Statement of Special Inspections and Tests.
  - 1. The document is provided for the Contractor's reference.

**PART 2 PRODUCTS (NOT USED)**


**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



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 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Clinton Elementary School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-004-014	Project Address 100 Montgomery Street, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11/17/2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:						
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A 1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		<b>3.3B</b> 1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1		3.4, 3.6A 1704.5	<input type="checkbox"/>	
		L2	<b>Sec. 1.13</b>	3.4, 3.6A 1704.5	<input type="checkbox"/>	
d. Prestressing technique.		L1		3.6B 1704.5	<input type="checkbox"/>	
Grout space prior to grouting.	<b>L2</b>			3.2D 1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.		<b>L1</b>		2.4B, 2.4H 1704.5	<input type="checkbox"/>	
Placement of grout.	<b>L2</b>			3.5 1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C 1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:						
a. Size and location of structural elements.		L1 & L2		3.3G 1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	<b>L2</b>	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6	1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4 1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	<b>L1 &amp; L2</b>		2.1.7.10.2, 3.3.3.4(b)	1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D 1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		<b>3.6B</b> <b>1704.5</b>	<input type="checkbox"/>	
3. Verification prior to grouting.		<b>L1</b>	<b>1.13</b>	3.2D, 3.4, 2.6B, 3.3B 1704.5	<input type="checkbox"/>	
	<b>L2</b>			1.4 1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C 1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Columbus School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-001-014	Project Address 18 South Perry Street, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:						
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A 1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B 1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1 L2	Sec. 1.13	3.4, 3.6A 1704.5 3.4, 3.6A 1704.5	<input type="checkbox"/> <input type="checkbox"/>	
d. Prestressing technique.		L1		3.6B 1704.5	<input type="checkbox"/>	
Grout space prior to grouting.	L2			3.2D 1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.		L1		2.4B, 2.4H 1704.5	<input type="checkbox"/>	
Placement of grout.	L2			3.5 1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C 1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:						
a. Size and location of structural elements.		L1 & L2		3.3G 1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6	1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4 1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)	1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D 1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B 1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.	L1 L2	L1	1.13	3.2D, 3.4, 2.6B, 3.3B 1.4 1704.5, 2105.2.2, 2105.3	<input type="checkbox"/> <input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C 1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Early Learning Center
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-008-022	Project Address 372 Church Street, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:						
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A 1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B 1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1		3.4, 3.6A 1704.5	<input type="checkbox"/>	
		L2	Sec. 1.13	3.4, 3.6A 1704.5	<input type="checkbox"/>	
d. Prestressing technique.		L1		3.6B 1704.5	<input type="checkbox"/>	
Grout space prior to grouting.	L2			3.2D 1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.		L1		2.4B, 2.4H 1704.5	<input type="checkbox"/>	
Placement of grout.	L2			3.5 1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C 1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:						
a. Size and location of structural elements.		L1 & L2		3.3G 1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6	1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4 1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)	1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D 1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B 1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.		L1	1.13	3.2D, 3.4, 2.6B, 3.3B 1.4 1704.5	<input type="checkbox"/>	
	L2			1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C 1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Poughkeepsie High School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-007-018	Project Address 70 Forbus Street, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Joseph Rausch	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input checked="" type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ASCE 5/TMS 402, Ch. 35	ACI 530.1/ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ASCE 5/TMS 402, Ch. 35	ACI 530.1/ASCE 6/TMS 602, Ch. 35	<input checked="" type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:						
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A 1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B 1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1	Sec. 1.13	3.4, 3.6A 1704.5	<input checked="" type="checkbox"/>	
		L2		3.4, 3.6A 1704.5	<input type="checkbox"/>	
d. Prestressing technique.		L1		3.6B 1704.5	<input type="checkbox"/>	
Grout space prior to grouting.	L2			3.2D 1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.		L1		2.4B, 2.4H 1704.5	<input checked="" type="checkbox"/>	
Placement of grout.	L2			3.5 1704.5	<input checked="" type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C 1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:						
a. Size and location of structural elements.		L1 & L2		3.3G 1704.5	<input checked="" type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6	1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4 1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)	1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D 1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B 1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.	L1  L2	L1	1.13	3.2D, 3.4, 2.6B, 3.3B 1.4 1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>  <input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C 1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Krieger Elementary School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-006-014	Project Address 265 Hooker Avenue, Poughkeepsie, NY 12603
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD		BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:							
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A	1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B	1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1	Sec. 1.13	3.4, 3.6A	1704.5	<input type="checkbox"/>	
		L2		3.4, 3.6A	1704.5	<input type="checkbox"/>	
d. Prestressing technique.		L1		3.6B	1704.5	<input type="checkbox"/>	
Grout space prior to grouting.	L2			3.2D	1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.		L1		2.4B, 2.4H	1704.5	<input type="checkbox"/>	
Placement of grout.	L2			3.5	1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C	1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:							
a. Size and location of structural elements.		L1 & L2		3.3G	1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6		1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4	1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)		1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D	1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B	1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.		L1	1.13	3.2D, 3.4, 2.6B, 3.3B	1704.5	<input type="checkbox"/>	
	L2			1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C	1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Morse Elementary School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-002-014	Project Address 101 Mansion Street, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:						
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A 1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B 1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1	Sec. 1.13	3.4, 3.6A 1704.5	<input type="checkbox"/>	
		L2		3.4, 3.6A 1704.5	<input type="checkbox"/>	
d. Prestressing technique.		L1		3.6B 1704.5	<input type="checkbox"/>	
Grout space prior to grouting.	L2			3.2D 1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.		L1		2.4B, 2.4H 1704.5	<input type="checkbox"/>	
Placement of grout.	L2			3.5 1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C 1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:						
a. Size and location of structural elements.		L1 & L2		3.3G 1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6	1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4 1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)	1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D 1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B 1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.	L2	L1	1.13	3.2D, 3.4, 2.6B, 3.3B 1.4 1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C 1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Poughkeepsie Middle School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-015-021	Project Address 55 College Avenue, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	
<b>C. Masonry Construction</b>						
L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ASCE 5/TMS 402, Ch. 35	ACI 530.1/ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ASCE 5/TMS 402, Ch. 35	ACI 530.1/ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:						
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A 1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B 1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1		3.4, 3.6A 1704.5	<input type="checkbox"/>	
		L2	Sec. 1.13	3.4, 3.6A 1704.5	<input type="checkbox"/>	
d. Prestressing technique.  Grout space prior to grouting.	L2	L1		3.6B 1704.5	<input type="checkbox"/>	
				3.2D 1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.  Placement of grout.	L2	L1		2.4B, 2.4H 1704.5	<input type="checkbox"/>	
				3.5 1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C 1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:						
a. Size and location of structural elements.		L1 & L2		3.3G 1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6	1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4 1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)	1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D 1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B 1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.	L1	L1	1.13	3.2D, 3.4, 2.6B, 3.3B 1704.5	<input type="checkbox"/>	
	L2			1.4 1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C 1704.5	<input type="checkbox"/>	




INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



 <b>NYS EDUCATION DEPARTMENT</b> <b>Office of Facilities Planning</b> <b>89 Washington Avenue, Room 1060 EBA</b> <b>Albany, NY 12234</b>	<b>STATEMENT OF SPECIAL INSPECTIONS AND TESTS</b> As required by the Building Code of NYS (BCNYS)
BCNYS § 1704.1.1 requires the project Design Professional to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests and submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit.	
School District Poughkeepsie City School District	Building Warring Elementary School
Project Title 2020 Capital Improvement Project, Phase 1B Building Improvements	
SED Project # 13-15-00-01-0-005-013	Project Address 283 Mansion Street, Poughkeepsie, NY 12601
Architect/Engineer CPL	
Name of Person Completing this Statement Mark Johnson	Phone 845-567-6700
Date 11-17-2021	
Comments	

INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
<b>A. Steel Construction</b>						
1. Material verification of high-strength bolts, nuts and washers.		X	Applicable ASTM material specifications. AISC 360, Section A3.3	1704.3	<input type="checkbox"/>	
2. Inspection of high-strength bolting.	X	X	AISC 360, Section M2.5	1704.3, 1704.3.3	<input type="checkbox"/>	
3. Material verification of structural steel.			ASTM A 6 or A 568	1704.3, 1708.4	<input type="checkbox"/>	
4. Material verification of weld filler materials.			AISC 360, Section A3.5	1704.3	<input type="checkbox"/>	
5. Inspection of welding:				1704.3	<input type="checkbox"/>	
a. Structural steel	X	X	AWS D1.1, D1.3	1704.3, 1704.3.1	<input type="checkbox"/>	
b. Reinforcing steel	X	X	AWS D1.4; ACI 318: 3.5.2	1704.3	<input type="checkbox"/>	
6. Inspection of steel frame joint details.		X		1704.3, 1704.3.2	<input type="checkbox"/>	
<b>B. Concrete Construction</b>						
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		X	ACI 318: 3.5, 7.1-7.7	1704.4, 1913.4	<input type="checkbox"/>	
2. Inspection of reinforcing steel welding.			AWS D1.4; ACI 318: 3.5.2	1704.4	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
3. Inspection of bolts to be installed in concrete prior to and during placement.	X			1704.4	<input type="checkbox"/>	
4. Verify use of required design mix.		X	ACI 318: Ch. 4, 5.2-5.4	1704.4, 1904.2.2, 1913.2, 1913.3	<input type="checkbox"/>	
5. Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C 172, C 31; ACI 318: 5.6, 5.8	1704.4, 1913.10	<input type="checkbox"/>	
6. Inspection of placement for proper application techniques.	X		ACI, 318: 5.9, 5.10	1704.4, 1913.6, 1913.7, 1913.8	<input type="checkbox"/>	
7. Inspection for maintenance of specified curing temperature and techniques.		X	ACI, 318: 5.11 - 5.13	1704.4, 1913.9	<input type="checkbox"/>	
8. Inspection of prestressed concrete.	X		ACI 318: 18.18.4, 18.20	1704.4	<input type="checkbox"/>	
9. Erection of precast concrete members.		X	ACI 318: Ch. 16	1704.4	<input type="checkbox"/>	
10. Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 6.2	1704.4	<input type="checkbox"/>	
11. Inspection of formwork		X	ACI 318: 6.1.1		<input type="checkbox"/>	

**C. Masonry Construction**

L1 = Level 1 Inspection required for nonessential facilities.			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	
L2 = Level 2 Inspection required for essential facilities. In general, schools are not considered essential facilities unless they are a designated emergency shelter			ACI 530/ ASCE 5/TMS 402, Ch. 35	ACI 530.1/ ASCE 6/TMS 602, Ch. 35	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD		BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
1. Verify to ensure compliance:							
a. Proportions of site prepared mortar and grout.		L1 & L2		2.6A	1704.5	<input type="checkbox"/>	
b. Placement of masonry units and construction of mortar joints.		L1 & L2		3.3B	1704.5	<input type="checkbox"/>	
c. Location and placement of reinforcement, connectors, tendons, anchorages.		L1	Sec. 1.13	3.4, 3.6A	1704.5	<input type="checkbox"/>	
		L2		3.4, 3.6A	1704.5	<input type="checkbox"/>	
d. Prestressing technique.  Grout space prior to grouting.	L2	L1		3.6B	1704.5	<input type="checkbox"/>	
				3.2D	1704.5	<input type="checkbox"/>	
e. Grade and size of prestressing tendons and anchorages.  Placement of grout.	L2	L1		2.4B, 2.4H	1704.5	<input type="checkbox"/>	
				3.5	1704.5	<input type="checkbox"/>	
f. Grout specs prior to grouting.	L2			3.6 C	1704.5	<input type="checkbox"/>	
2. Inspection program shall verify:							
a. Size and location of structural elements.		L1 & L2		3.3G	1704.5	<input type="checkbox"/>	
b. Type, size, and location of anchors.	L2	L1	Sec. 1.2.2(e), 2.1.4, 3.1.6		1704.5	<input type="checkbox"/>	
c. Specified size, grade, and type of reinforcement.		L1 & L2	Sec. 1.13	2.4, 3.4	1704.5	<input type="checkbox"/>	
d. Welding of reinforcing bars.	L1 & L2		2.1.7.10.2, 3.3.3.4(b)		1704.5	<input type="checkbox"/>	
e. Cold/hot weather protection of masonry construction.		L1 & L2		1.8C, 1.8D	1704.5, 2104.3, 2104.4	<input type="checkbox"/>	
f. Prestressing force measurement and application.	L2	L1		3.6B	1704.5	<input type="checkbox"/>	
3. Verification prior to grouting.	L1	L1	1.13	3.2D, 3.4, 2.6B, 3.3B	1704.5	<input type="checkbox"/>	
	L2			1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
4. Grout placement.	L1			3.5, 3.6C	1704.5	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
5. Preparation of grout specimens, mortar specimens, and/or prisms.	L1 & L2		1.4	1704.5, 2105.2.2, 2105.3	<input type="checkbox"/>	
6. Compliance with documents and submittals.		L1 & L2	1.5	1704.5	<input type="checkbox"/>	
<b>D. Wood Construction</b>						
1. Fabrication process of prefabricated wood structural elements and assemblies.				1704.6, 1704.2	<input type="checkbox"/>	
2. High-load diaphragms designed in accordance with Table 2306.3.2				1704.6.1, 1704.1	<input type="checkbox"/>	
<b>E. Soils</b>				1704.7	<input type="checkbox"/>	
<b>F. Pile Foundations</b>				1704.8	<input type="checkbox"/>	
<b>G. Pier Foundations</b>				1704.9	<input type="checkbox"/>	
<b>H. Sprayed Fire-Resistant Materials</b>						
1. Structural member surface conditions.				1704.10.1	<input type="checkbox"/>	
2. Application.				1704.10.2	<input type="checkbox"/>	
3. Thickness.			ASTM E 605	1704.10.3	<input type="checkbox"/>	
4. Density.			ASTM E 605	1704.10.4	<input type="checkbox"/>	
5. Bond strength.			ASTM E 736	1704.10.5	<input type="checkbox"/>	
<b>I. Mastic and Intumescent Fire-Resistant Coatings</b>				1704.11	<input type="checkbox"/>	
<b>J. Exterior Insulation and Finish Systems (EIFS)</b>				1704.12	<input type="checkbox"/>	
<b>K. Special Cases</b>				1704.13	<input type="checkbox"/>	
<b>L. Smoke Control</b>				1704.14	<input type="checkbox"/>	
<b>M. Special Inspections for Seismic Resistance</b>						
1. Structural steel.	X		AISC 341	1707.2	<input type="checkbox"/>	
2. Structural wood.	X			1707.3	<input type="checkbox"/>	
3. Cold-formed steel framing.		X		1707.4	<input type="checkbox"/>	
4. Pier Foundations.		X		1707.5	<input type="checkbox"/>	
5. Storage racks and access floors.		X		1707.6	<input type="checkbox"/>	



INSPECTION AND TESTING (Continuous & Periodic is as Defined by the BCNYS)	CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
6. Architectural components.		X		1707.7	<input type="checkbox"/>	
7. Mechanical and electrical components.		X		1707.8	<input type="checkbox"/>	
8. Designated seismic system verifications				1707.9	<input type="checkbox"/>	
9. Seismic isolation system.		X		1707.10	<input type="checkbox"/>	
<b>N. Structural Testing for Seismic Resistance</b>						
1. Testing and verification of masonry materials and assemblies prior to construction.				1708.1	<input type="checkbox"/>	
2. Testing for seismic resistance.				1708.2	<input type="checkbox"/>	
3. Reinforcing and prestressing steel.			ACI 318	1708.3	<input type="checkbox"/>	
4. Structural steel.			AISC 341, AWS D1.1	1708.4	<input type="checkbox"/>	
5. Seismic qualification of mechanical and electrical equipment.				1708.5	<input type="checkbox"/>	
6. Seismically isolated structures.			Section 17.8 of ASCE 7	1708.6	<input type="checkbox"/>	
<b>O. Structural Observations</b>						
1. Seismic resistance.				1709.2	<input type="checkbox"/>	
2. Wind requirements.				1709.3	<input type="checkbox"/>	
<b>P. Test Safe Load</b>				1712	<input type="checkbox"/>	
<b>Q. In-Situ Load Tests</b>				1713	<input type="checkbox"/>	
<b>R. Preconstruction Load Tests</b>				1714	<input type="checkbox"/>	
<b>S. Other (list)</b>					<input type="checkbox"/>	



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**SECTION 01 5001**  
**TEMPORARY FACILITIES & CONTROLS-MULTIPLE PRIME CONTRACTS****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection for Multiple Prime Contract projects..
- B. Temporary utilities include, but are not limited to, the following:
  - 1. Water service and distribution.
  - 2. Temporary electric power and light.
  - 3. Temporary heat.
  - 4. Ventilation and Humidity Control.
  - 5. Telephone service.
  - 6. Sanitary facilities, including drinking water.
  - 7. Storm and sanitary sewer.
- C. Support facilities include, but are not limited to, the following:
  - 1. Field offices and storage containers.
  - 2. Temporary roads and paving.
  - 3. Dewatering facilities and drains.
  - 4. Temporary partitions and enclosures.
  - 5. Hoists and temporary elevator use.
  - 6. Temporary project identification sign and project signage.
  - 7. Waste disposal services and dumpsters.
  - 8. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
  - 1. Temporary fire protection.
  - 2. Barricades, warning signs, and lights.
  - 3. Environmental protection.
  - 4. Tree and plant protection.
  - 5. Security enclosure and lockup.
  - 6. Temporary enclosures.
  - 7. Temporary partitions.
  - 8. Sidewalk Bridge for maintaining legal exits.
  - 9. Enclosure fence for the work site.
  - 10. Environmental Protection
- E. Related Sections:
  - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

**1.02 INFORMATIONAL SUBMITTALS**

- A. Temporary Utilities: Each prime contractor shall submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
  - B. Implementation and Termination Schedule: Within 15 days of the date established for submittal of the Contractor's Construction Schedule, each prime contractor shall submit a schedule indicating implementation and termination of each temporary utility for which the Contractor is responsible.
  - C. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
  - D. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent
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- E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
  - F. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.
    - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
    - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
    - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
  - G. Dust-Control and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust-control and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
    - 1. Locations of dust-control partitions at each phase of the work.
    - 2. HVAC system isolation schematic drawing.
    - 3. Location of proposed air filtration system discharge.
    - 4. Other dust-control measures.
    - 5. Waste management plan.
  - H. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

**1.03 DEFINITIONS**

- A. Temporary Enclosure: As determined by Architect, temporary roofing is complete, insulated, all exterior wall openings are closed with temporary closures.
- B. Permanent Enclosure: As determined by Architect, permanent roofing is complete, insulated, and weather tight; exterior walls are insulated and weather tight; and all openings are closed with permanent construction or substantial temporary closures.
- C. Temporary Facilities: Construction, fixtures, fittings, and other built items required to accomplish the work but which are not incorporated into the finished work.
- D. Temporary Utilities: A type of temporary facility, primary sources of electric power, water, natural gas supply, etc., obtained from public utilities, other main distribution systems, or temporary sources constructed for the project, but not including the fixtures and equipment served.
- E. Temporary Services: Activities required during construction, which do not directly accomplish the work.

**1.04 QUALITY ASSURANCE**

- A. Regulations: The contractor shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
    - 1. Building code requirements.
    - 2. Health and safety regulations.
    - 3. Utility company regulations.
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- 4. Police, fire department and rescue squad rules.
  - 5. Environmental protection regulations.
  - B. Standards: The Contractor shall comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
  - C. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with the normal application of trade regulations and union jurisdictions.
  - D. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

**1.05 USE CHARGES**

- A. General: Installation and removal of, and use charges for, temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
  - 1. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
  - 2. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
  - 3. Gas Service from Existing System: Gas Service from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- B. Cost or use charges for temporary facilities are not chargeable to the Owner or the Architect. The Architect will not accept a prime contractor's cost or use charges for temporary services or facilities as a basis of claim for an adjustment in the Contract Sum or the Contract Time.
- C. Other entities using temporary services and facilities include, but are not limited to, the following:
  - 1. Other nonprime contractors.
  - 2. The Owner's work forces.
  - 3. Occupants of the Project.
  - 4. The Architect.
  - 5. Testing agencies.
  - 6. Personnel of government agencies.

**1.06 PROJECT CONDITIONS**

- A. Temporary Utilities: Each prime contractor shall prepare a schedule indicating dates for implementation and termination of each temporary utility for which the Contractor is responsible. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
  - B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.
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- C. Temporary Use of Permanent Facilities: If the Owner permits temporary use of the permanent facilities the Installer of each permanent service shall assume responsibility for its operation, maintenance, and protection during use as a construction facility prior to the Owner's acceptance, regardless of previously assigned responsibilities.

**1.07 DIVISION OF RESPONSIBILITIES**

- A. General: These Specifications assign each prime contractor specific responsibilities for providing certain temporary facilities used by other prime contractors and other entities at the site. The Contractor for General Construction is responsible for providing temporary facilities and controls that are not normal construction activities of other prime contractors and are not specifically assigned otherwise by this specification.
- B. EACH PRIME CONTRACTOR is responsible for the following:
1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, as well as the costs and use charges associated with each facility.
  2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
  3. Its own field office complete with necessary furniture, utilities, and telephone service.
  4. Its own storage containers for tools and storage of materials not incorporated into the building construction.
  5. Dewatering for their own construction operations.
  6. Temporary heat, ventilation, humidity control, and enclosure of the building prior to "Permanent Enclosure" where these facilities are necessary for its construction activity to protect the work, but have not yet been completed by the responsible prime contractor.
    - a. Temporary ventilation to control temperature and humidity is required by the Contractor responsible for installing the specified finish and equipment as these finishes may be damaged by excessive humidity or promote the growth of mold. The permanent HVAC system shall not be relied upon to provide the necessary ventilation or conditioning of the humidity in the building. Each Contractor is required to protect their work in place and provide the necessary ventilation and or humidity control.
  7. Temporary Generator if electrical power has not been installed to the site.
  8. Collection and disposal of its own hazardous, dangerous, unsanitary, or other harmful waste material.
  9. Collection of its waste material and transporting to a dumpster.
  10. Secure lockup of its own tools, materials, and equipment.
  11. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- C. The **General Construction Contractor** is responsible for the following:
1. General disposal of wastes and spoil from the site areas.
  2. Temporary fencing enclosing construction work and storage areas.
  3. Barricades, warning signs, and lights related to the building work
  4. Temporary safety railings and stairs.
  5. Temporary toilets, including disposable supplies.
  6. Temporary partitions required for project phasing or necessary to perform the work.
  7. General disposal of wastes for all prime contracts including costs for dumpsters.
  8. Building exit bridges and fences.
  9. Security enclosure and lockup.
  10. Project Identification signage, directional signage and safety signage.
- D. The **Mechanical/ HVAC Contractor** is responsible for the following:
1. Temporary Heat after "Permanent Enclosure" where the permanent heating system is not ready for use or cannot be used **including fuel costs**.



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- E. The **Electrical Contractor** is responsible for the following:
1. Temporary electric power service and branch distribution.
  2. Temporary lighting.
  3. Electric Power Service: With the exception of the project office trailers at the Site, use electric power from the Owner's existing system without metering and without payment of use charges.
  4. Electric Power Service: The Electrical Contractor shall pay electric power service use charges, whether metered or otherwise, for electricity used by the project office trailers at the Project Site (for bidding purposes, assume 1 office trailer for each prime contractor).

**PART 2 PRODUCTS****2.01 MATERIALS**

- A. General: Each prime contractor shall provide new materials. If acceptable to the Architect, undamaged, previously used materials in serviceable condition may be used. Provide materials suitable for use intended.
- B. Lumber and Plywood:
1. For job-built sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
  2. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch- thick exterior plywood.
- C. Gypsum Wallboard: Provide 5/8 Type X gypsum wallboard on interior walls of temporary offices or temporary partitions.
- D. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary offices, shops, and sheds.
- E. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- F. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- G. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- H. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- I. Water: Provide potable water approved by local health authorities.
- J. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails.
- K. Open-Mesh Fencing: Provide 0.12-inch- thick, galvanized 2-inch chain link fabric fencing 6 feet high and galvanized steel pipe posts, 1-1/2 inches I.D. for line posts and 2-1/2 inches I.D. for corner posts.

**2.02 EQUIPMENT**

- A. General: Each prime contractor shall provide new equipment. If acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4-inch heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
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- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
  - D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
  - E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
  - F. Heating and ventilating units: Provide temporary heating and ventilating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.
    - 1. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
      - a. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
      - b. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
      - c. Retain MERV of 8 for LEED-NC or LEED-CI Credit EQ 3.1.
    - 2. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system.
    - 3. Air Filtration Units: HEPA primary and secondary filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.
  - G. Temporary Toilet Units: The General Contractor shall provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
  - H. Fire Extinguishers: Each prime contractor will provide hand-carried, portable, UL-rated; Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
    - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

**2.03 TEMPORARY SUPPORT FACILITIES**

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
  - B. Temporary Field Offices: Each prime contractor shall provide its own prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
  - C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
    - 1. Store combustible materials apart from building.
-



## 2.04 TEMPORARY UTILITIES

- A. Telephone Service: Each contractor is responsible for his or her own telephone service.
  - 1. Equip each project superintendent/ foremen with a cellular telephone. This person shall be able to receive emergency calls 24 hrs. a day, 7 days a week.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Each prime contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
    - 1. Arrange with the company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
  - B. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
  - C. The contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
  - D. Sanitary Facilities: The General Contractor will provide temporary toilets for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
    - 1. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
    - 2. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
  - E. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
  - F. Drinking-Water Facilities: Each Contractor shall provide containerized, tap-dispenser, drinking-water units, including paper cup supply.
  - G. Temporary Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
    - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
  - H. Temporary Heat: Each prime contractor will provide temporary heat required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize energy consumption. Direct fired propane or Kerosene salamanders will not be permitted.
  - I. Upon "Permanent Enclosure" of the building, the **Mechanical/ HVAC** Contractor shall provide temporary heat until the permanent heating system can be utilized.
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TEMPORARY FACILITIES &  
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1. Temporary Heat: Provide temporary heat in all existing areas that are under construction and/or have their permanent heat temporarily or permanently shut off for construction reasons.
  2. Temporary heat must not damage any materials, new or existing, within or without the Project limits, on school property, nor shall it cause noxious odors or fumes or some other nuisance.
- J. Heating Facilities: Except where the Owner authorizes use of the permanent system, the **Mechanical/ HVAC Contractor** will provide vented, indirect fired, self-contained, LP-gas or fuel oil heaters with individual space thermostatic control.
1. Use of direct-fired Kerosene-burning space heaters, open flame, or salamander-type heating units is prohibited.
  2. Protect all permanent equipment put into services from dust, dust infiltration and soiling by installing filtering media at each supply and return outlet. Filters shall be changed in all air handling equipment including unit vents prior to owner occupancy. Failure to provide the necessary protection to the equipment may result in the contractor to be charged to clean the equipment and associated ductwork.
- K. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
1. Prior to commencing work, The Mechanical/ HVAC Contractor will isolate the HVAC system in area where work is to be performed in accordance with approved coordination drawings.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. The **Mechanical/HVAC Contractor** will maintain negative air pressure within work area using HEPA-equipped air filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  2. The **General Contractor** will maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.
  3. Each Contractor will perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

**3.03 SUPPORT FACILITIES INSTALLATION**

- A. Each prime contractor will locate field offices, storage trailers, sanitary facilities, and other temporary construction and support facilities for easy access.
    1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
    2. Refer to the phasing plans for locations of storage trailers
  - B. Field Offices: Each prime contractor shall provide an insulated, weather tight temporary office of sufficient size to accommodate required office personnel at the Project Site. Keep the office clean and orderly for use for small meetings. Furnish and equip offices as follows:
  - C. Storage trailers/ containers: Each prime contractor will install storage containers equipped to accommodate materials and equipment involved. Storage trailers are to be located at each site in the designated staging areas located on the phasing plans.
  - D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
    1. Protect existing site improvements to remain including curbs, pavement, and utilities.
    2. Maintain access for fire-fighting equipment and access to fire hydrants.
  - E. Temporary Parking/Staging and Access Roads
    1. Coordinate temporary parking by construction personnel with the Owner.
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2. Traffic Regulations:
    - a. Access through Owner's entrances shall be limited.
    - b. Utilize only designated entrances.
    - c. Maintain all site traffic regulations.
  - F. Collection and Disposal of Waste: Each prime contractor will collect waste from their construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. The Owner will enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly.
  - G. The General Construction Contractor will provide waste-collection containers in sizes adequate to handle waste from construction operations. The General Construction Contractor will provide dumpsters at **each** site for use by all other prime and subcontracts (except the Roofing Contractor).
    1. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.
  - H. Stairs: General Construction Contractor will provide temporary stairs in areas of new construction until permanent stairs are available. Provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.
  - I. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
    1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.
  - J. Temporary Lifts and Hoists: Each prime contractor will provide facilities for hoisting materials.
  - K. Temporary Elevator Use: Use of the owner's existing elevators will not be permitted.

**3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.
  - B. Protection of Existing Facilities: Each contractor will protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
  - C. Environmental Protection: Each contractor will provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.. Avoid using tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
    1. Comply with work restrictions specified in Division 01 Section "Summary."
  - D. Barricades, Warning Signs, and Lights: The **General Contractor** will comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.
  - E. Temporary Signs: The **General Contractor** will prepare signs to provide directional information to construction personnel and visitors for each site. Unauthorized signs are not permitted.
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1. For construction traffic control/flow at entrances/exits, as designated by the Owner.
  2. For warning signs as required
  3. Per OSHA standards as necessary
  4. For trailer identification
  5. For "No Smoking" safe work site at multiple locations.
- F. Temporary Egress: The **General Contractor** will maintain temporary egress from existing occupied facilities as required by authorities having jurisdiction.
- G. Temporary Enclosures: Each prime contractor will provide temporary enclosure for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
1. Where heat is needed and the "Permanent Enclosure" is not complete, the contractor responsible for the work will provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. or less with plywood or similar materials.
  3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
  4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use UL labeled, fire-retardant-treated material for framing and main sheathing.
  5. Temporary closures for specific openings for the contractor to perform their work are the responsibility of Contractor creating the opening and shall be installed to protect building from exterior elements.
- H. Temporary Partitions: **General Construction Contractor** will provide floor-to-ceiling dustproof partitions to limit dust, dirt migration, fumes and noise to separate areas occupied by the Owner.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
  2. Insulate partitions to provide noise protection to occupied areas.
  3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
  4. Protect air-handling equipment.
  5. Weather strip openings.
  6. Provide walk-off mats at each entrance through temporary partition.
- I. Temporary Fire Protection: Each prime contractor until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10, "Standard for Portable Fire Extinguishers," and NFPA 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
1. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  2. Smoking in construction areas is prohibited.
  3. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
  4. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Smoking in hazardous fire-exposure areas is prohibited.
  5. Store combustible materials in containers in fire-safe locations
  6. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
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- J. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection system, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
  - K. Security Enclosure and Lockup: The **General Construction Contractor** will install substantial temporary enclosure of partially completed areas of construction. Provide temporary doors and locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
    - 1. Storage: Each prime contractor is responsible to provide a secure lock-up for their materials and equipment, items of value or attractive for theft, etc.. Coordinate work in connection with the installation and control release of material to minimize the opportunity for theft and vandalism.

**3.05 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities and good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Unless the Architect requests that it be maintained longer, each prime contractor will remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore, permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are the property of each prime contractor.
- E. At Substantial Completion: Each prime contractor shall repair, renovate, and clean permanent facilities related to their contract used during construction period.

**END OF SECTION**



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**SECTION 01 6000  
PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

**1.02 DEFINITIONS**

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

**1.03 ACTION SUBMITTALS**

- A. Submit submittals as required per each individual specification section.

**1.04 QUALITY ASSURANCE**

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
  - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
  - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

**1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
  - B. Delivery and Handling:
    - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
    - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
    - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
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4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
  1. Store products to allow for inspection and measurement of quantity or counting of units.
  2. Store materials in a manner that will not endanger Project structure.
  3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
  5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  6. Protect stored products from damage and liquids from freezing.
  7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## **1.06 PRODUCT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
  1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

## **PART 2 PRODUCTS**

### **2.01 PRODUCT SELECTION PROCEDURES**

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
  1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Architect will make selection.
  5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:



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1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  3. Products:
    - a. Non-restricted List: Where Specifications include a list of names of available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with substitution requirements for consideration of an unnamed product.
  4. Manufacturers:
    - a. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with substitution requirements for consideration of an unnamed manufacturer's product.
  5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with substitution requirements for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product is available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## **2.02 EQUIVALENT PRODUCTS**

- A. Conditions for Consideration: Architect will consider Contractor's request for equivalent product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples.
- B. Refer to specification section 012519 Equivalents for additional equivalent product requirements required to be furnished by the contractor.

## **PART 3 EXECUTION (NOT USED)**

### **END OF SECTION**



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**SECTION 01 7300  
EXECUTION**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Coordination of Owner-installed products.
  - 6. Progress cleaning.
  - 7. Starting and adjusting.
  - 8. Protection of installed construction.

**1.02 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For land surveyor, professional engineer, etc. licensed to practice in New York State.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least **10** days prior to the time cutting and patching will be performed. Include the following information:
  - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
  - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
  - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
    - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

**1.04 QUALITY ASSURANCE**

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.



1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
  2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Mechanical systems piping and ducts.
    - f. Control systems.
    - g. Communication systems.
    - h. Fire-detection and -alarm systems.
    - i. Conveying systems.
    - j. Electrical wiring systems.
    - k. Operating systems of special construction.
  3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, or that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
    - a. Water, moisture, or vapor barriers.
    - b. Membranes and flashings.
    - c. Exterior curtain-wall construction.
    - d. Sprayed fire-resistive material.
    - e. Equipment supports.
    - f. Piping, ductwork, vessels, and equipment.
    - g. Noise- and vibration-control elements and systems.
  4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
  - B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
    1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.
  - C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
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## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### **3.02 PREPARATION**

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

### **3.03 CONSTRUCTION LAYOUT**

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
  - B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
-



1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  2. Establish limits on use of Project site.
  3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  4. Inform installers of lines and levels to which they must comply.
  5. Check the location, level and plumb, of every major element as the Work progresses.
  6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
  7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

### 3.04 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of **two** permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

### 3.05 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
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2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  4. Maintain minimum headroom clearance of **96 inches]**in occupied spaces and **90 inches** in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
  - C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
  - D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
  - E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
  - F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
  - G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
  - H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
    1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
    2. Allow for building movement, including thermal expansion and contraction.
    3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
  - I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
  - J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### **3.06 CUTTING AND PATCHING**

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
    1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  - B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
  - C. Temporary Support: Provide temporary support of work to be cut.
  - D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
  - E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
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- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch extending to an inside or outside corner of a wall. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### **3.07 OWNER-INSTALLED PRODUCTS**

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
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1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

### **3.08 PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.09 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.



- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

**3.10 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

**END OF SECTION**



**SECTION 01 7700  
CLOSEOUT PROCEDURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

**1.03 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

**1.04 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

**1.05 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete. The Architect will not perform a punch list inspection until the contractor's punch list is received and reviewed.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 30 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number where applicable.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain **Owner's** signature for receipt of submittals.
  - 5. Submit test/adjust/balance records.



6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 30 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  2. Complete startup and testing of systems and equipment
  3. Submit test/adjust/balance records.
  4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  5. Perform preventive maintenance on equipment used prior to Substantial Completion. Complete startup testing of systems.
  6. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
  7. Touch up paint and otherwise repair and restore damaged finishes.
  8. Complete final cleaning requirements, including touchup painting
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 30 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
    - a. The Architects basic services include (1) initial punch list and (1) follow-up punch list inspection to ensure all corrective action and or incomplete work has been finished. The Contractor is responsible to the Owner for all costs incurred by the Architect for additional services to provide multiple punch lists for the same work area. The cost for these additional services, may be deducted from the Contractors Contract by deduct Change Order.
  2. Results of completed inspection will form the basis of requirements for final completion.

#### **1.06 FINAL COMPLETION PROCEDURES**

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
    1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
    2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
    3. Submit pest-control final inspection report.
    4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
    5. Advise Owner of pending insurance changeover requirements.
    6. Advise Owner of changeover in heat and other utilities.
    7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
    8. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
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9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  10. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  11. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  12. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
- B. Inspection: Submit a written request for final inspection to determine acceptance, a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### **1.07 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first, and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. MS Excel electronic file. Architect will return annotated file.

#### **1.08 SUBMITTAL OF PROJECT WARRANTIES**

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within **15** days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
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4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## **PART 3 EXECUTION**

### **3.01 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove snow and ice to provide safe access to building.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - h. Sweep concrete floors broom clean in unoccupied spaces.
    - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - k. Remove labels that are not permanent.
    - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.



- 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
- p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

### **3.02 REPAIR OF THE WORK**

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

**END OF SECTION**



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**SECTION 01 7823  
OPERATION AND MAINTENANCE DATA****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Emergency manuals.
  - 3. Operation manuals for systems, subsystems, and equipment.
  - 4. Product maintenance manuals.
  - 5. Systems and equipment maintenance manuals.

**1.02 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

**1.03 CLOSEOUT SUBMITTALS**

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect, and Commissioning Authority (if applicable), will comment on whether content of operations and maintenance submittals are acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
  - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.

**PART 2 PRODUCTS****2.01 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY**

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
  - 1. List of documents.
  - 2. List of systems.
  - 3. List of equipment.
  - 4. Table of contents.
- B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
  - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.



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2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
  - C. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## **2.02 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS**

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
    1. Title page.
    2. Table of contents.
    3. Manual contents.
  - B. Title Page: Include the following information:
    1. Subject matter included in manual.
    2. Name and address of Project.
    3. Name and address of Owner.
    4. Date of submittal.
    5. Name and contact information for Contractor.
    6. Name and contact information for Construction Manager.
    7. Name and contact information for Architect.
    8. Name and contact information for Commissioning Authority.
    9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
    10. Cross-reference to related systems in other operation and maintenance manuals.
  - C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
    1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
  - D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
  - E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
    1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
    2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
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**2.03 EMERGENCY MANUALS**

- A. Content: Organize manual into a separate section for each of the following:
  - 1. Type of emergency.
  - 2. Emergency instructions.
  - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  - 1. Fire.
  - 2. Flood.
  - 3. Gas leak.
  - 4. Water leak.
  - 5. Power failure.
  - 6. Water outage.
  - 7. System, subsystem, or equipment failure.
  - 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
  - 1. Instructions on stopping.
  - 2. Shutdown instructions for each type of emergency.
  - 3. Operating instructions for conditions outside normal operating limits.
  - 4. Required sequences for electric or electronic systems.
  - 5. Special operating instructions and procedures.

**2.04 OPERATION MANUALS**

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
    - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
    - 2. Performance and design criteria if Contractor has delegated design responsibility.
    - 3. Operating standards.
    - 4. Operating procedures.
    - 5. Operating logs.
    - 6. Wiring diagrams.
    - 7. Control diagrams.
    - 8. Piped system diagrams.
    - 9. Precautions against improper use.
    - 10. License requirements including inspection and renewal dates.
  - B. Descriptions: Include the following:
    - 1. Product name and model number. Use designations for products indicated on Contract Documents.
    - 2. Manufacturer's name.
    - 3. Equipment identification with serial number of each component.
    - 4. Equipment function.
    - 5. Operating characteristics.
    - 6. Limiting conditions.
    - 7. Performance curves.
    - 8. Engineering data and tests.
    - 9. Complete nomenclature and number of replacement parts.
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- C. Operating Procedures: Include the following, as applicable:
    - 1. Startup procedures.
    - 2. Equipment or system break-in procedures.
    - 3. Routine and normal operating instructions.
    - 4. Regulation and control procedures.
    - 5. Instructions on stopping.
    - 6. Normal shutdown instructions.
    - 7. Seasonal and weekend operating instructions.
    - 8. Required sequences for electric or electronic systems.
    - 9. Special operating instructions and procedures.
  - D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
  - E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

## **2.05 PRODUCT MAINTENANCE MANUALS**

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.

## **2.06 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS**

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.



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- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
  - C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
    - 1. Standard maintenance instructions and bulletins.
    - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
    - 3. Identification and nomenclature of parts and components.
    - 4. List of items recommended to be stocked as spare parts.
  - D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
    - 1. Test and inspection instructions.
    - 2. Troubleshooting guide.
    - 3. Precautions against improper maintenance.
    - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    - 5. Aligning, adjusting, and checking instructions.
    - 6. Demonstration and training video recording, if available.
  - E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
    - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
    - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
  - F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
  - G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
  - H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
    - 1. Include procedures to follow and required notifications for warranty claims.

## **PART 3 EXECUTION**

### **3.01 MANUAL PREPARATION**

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
  - B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
  - C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
  - D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
    - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
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2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  1. Do not use original project record documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

**END OF SECTION**



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**SECTION 01 7839**  
**PROJECT RECORD DOCUMENTS****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous record submittals.
- B. Related Requirements:
  - 1. Division 01 "Multiple Contract Summary" for coordinating project record documents covering the Work of multiple contracts.
  - 2. Division 01 "Execution" for final property survey.
  - 3. Division 01 "Closeout Procedures" for general closeout procedures.
  - 4. Division 01 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 5. Divisions 02 through 49 Sections for specific requirements for project record documents of the Work in those Sections.

**1.02 CLOSEOUT SUBMITTAL**

- A. Record Drawings: Comply with the following:
    - 1. Number of Copies: Submit **[one][ or Insert number]** set(s) of marked-up record prints.
    - 2. Number of Copies: Submit copies of record Drawings as follows:
      - a. Initial Submittal:
        - 1) Submit **[one] [or Insert number]** paper-copy set(s) of marked-up record prints.
        - 2) Submit PDF electronic files of scanned record prints and **[one]** or Insert number of file prints.
        - 3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
        - 4) Submit Record Digital Data Files and **[one]** or Insert number set(s) of plots.
      - b. Final Submittal:
        - 1) Submit **[three] [or Insert number]** paper-copy set(s) of marked-up record prints.
        - 2) Submit PDF electronic files of scanned record prints and **[three] [or Insert number]** set(s) of prints.
        - 3) Print each drawing, whether or not changes and additional information were recorded.
        - 4) Submit Record Digital Data Files and **[one] [or Insert number]** set(s) of plots.
  - B. Record Specifications: Submit **[one paper copy] [or Insert number paper copies] [annotated PDF electronic files]** of Project's Specifications, including addenda and contract modifications.
  - C. Record Product Data: Submit **[one paper copy] [or Insert number paper copies] [annotated PDF electronic files and directories]** of each submittal.
    - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
  - D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit **[one paper copy] [or Insert number paper copies] [annotated PDF electronic files and directories]** of each submittal.
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- E. Reports: Submit written report **[weekly]** indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

### 1.03 RECORD DRAWINGS

- A. Record Drawings: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding archive photographic documentation.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or [Construction] [Work] Change Directive.
    - k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
  7. Submit as indicated in the Article 1.2 final submittal.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record drawings with Architect **[ and Construction Manager]**. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
  2. Format: Annotated PDF electronic file **[ with comment function enabled]**.
  3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
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4. Refer instances of uncertainty to Architect [ **through Construction Manager**] for resolution.
  5. Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  6. Architect will furnish Contractor one set of digital data PDF files of the Contract Drawings for use in recording information.
    - a. See Section 013300 "Submittal Procedures" for requirements related to use of Architect's digital data files.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
  2. Consult Architect [ **and Construction Manager**] for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
  3. Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  4. Submit as indicated in the Article 1.2 final submittal.

#### 1.04 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  5. Note related Change Orders [**record Product Data,**] and record Drawings where applicable.
  6. Submit as indicated in the Article 1.2 final submittal

#### 1.05 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders [**record Specifications,**] and record Drawings where applicable.
  4. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.
  5. Submit as indicated in the Article 1.2 final submittal

#### 1.06 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
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1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.
2. Submit as indicated in the Article 1.2 final submittal

**PART 2 PRODUCT (NOT USED)****PART 3 EXECUTION****3.01 RECORDING AND MAINTENANCE**

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's **[and Construction Manager's]** reference during normal working hours.

**END OF SECTION**



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**SECTION 01 7900**  
**DEMONSTRATION AND TRAINING****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Demonstration and training video recordings.

**1.02 INFORMATIONAL SUBMITTALS**

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

**1.03 CLOSEOUT SUBMITTALS**

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name and address of videographer.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Date of video recording.
  - 2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
  - 3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

**1.04 QUALITY ASSURANCE**

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.



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- C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
    - 1. Inspect and discuss locations and other facilities required for instruction.
    - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
    - 3. Review required content of instruction.
    - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

#### **1.05 COORDINATION**

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

#### **1.06 INSTRUCTION PROGRAM**

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project record documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  - 3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.
  - 4. Operations: Include the following, as applicable:



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- a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
    - a. Alignments.
    - b. Checking adjustments.
    - c. Noise and vibration adjustments.
    - d. Economy and efficiency adjustments.
  6. Troubleshooting: Include the following:
    - a. Diagnostic instructions.
    - b. Test and inspection procedures.
  7. Maintenance: Include the following:
    - a. Inspection procedures.
    - b. Types of cleaning agents to be used and methods of cleaning.
    - c. List of cleaning agents and methods of cleaning detrimental to product.
    - d. Procedures for routine cleaning
    - e. Procedures for preventive maintenance.
    - f. Procedures for routine maintenance.
    - g. Instruction on use of special tools.
  8. Repairs: Include the following:
    - a. Diagnosis instructions.
    - b. Repair instructions.
    - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    - d. Instructions for identifying parts and components.
    - e. Review of spare parts needed for operation and maintenance.

#### **1.07 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

#### **1.08 INSTRUCTION**

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
  - B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
    1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
    2. Owner will furnish an instructor to describe Owner's operational philosophy.
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3. Owner will furnish Contractor with names and positions of participants.
  - C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
    1. Schedule training with Owner with at least seven days' advance notice.
  - D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
  - E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
  - F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

#### **1.09 DEMONSTRATION AND TRAINING VIDEO RECORDINGS**

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
    1. At beginning of each training module, record each chart containing learning objective and lesson outline.
  - B. Video: Provide minimum 1080 video resolution converted to format file type acceptable to Owner, on electronic media.
    1. Electronic Media: Read-only format compact disc with commercial-grade graphic label or flash drive as acceptable to Owner,
    2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
    3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
    4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
      - a. Name of Contractor/Installer.
      - b. Business address.
      - c. Business phone number.
      - d. Point of contact.
      - e. E-mail address.
  - C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
    1. Film training session(s) in segments not to exceed 15 minutes.
      - a. Produce segments to present a single significant piece of equipment per segment.
      - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
      - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
  - D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
    1. Furnish additional portable lighting as required.
  - E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
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- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

**END OF SECTION**



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**SECTION 02 0800  
ASBESTOS ABATEMENT PROCEDURES**

**PART I – GENERAL**

**1.01 DESCRIPTION**

- A. All work under this contract shall be performed in strict accordance with the specifications and all applicable laws for asbestos removal projects. The Abatement Contractor shall furnish all labor, materials, supervision, services, insurance and equipment necessary for the complete and total removal of Asbestos-containing Materials (ACM) as described herein, in attachments to the specification, Job Specific Variance(s) and/or as directed by Ossining UFSD (here-in-after the "Owner") and/or the Owners Representative(s) to support the ***Poughkeepsie CSD – 2020 Capital Improvement Project – Phase 1B Building Improvements.***
- B. Abatement Contractor shall provide for personnel air monitoring to satisfy OSHA regulation 29 CFR Parts 1926.1101(f). All work performed shall be in strict accordance with applicable provisions and regulations promulgated under New York State Department of Labor, Industrial Code 56 (ICR-56).
- C. The Abatement Contractor shall satisfy the requirements for asbestos projects issued by the New York State Department of Labor concerning licensing and certification; notification; equipment; removal and disposal procedures; engineering controls; work area preparation; decontamination and clean-up procedures; and personnel air monitoring.
- D. The Abatement Contractor shall be responsible for submittal of asbestos project notification(s) and applicable fees to EPA and NYSDOL concerning this project. Project notification(s) shall be made for the cumulative total of ACM to be removed as required by ICR-56-3.4. Work practices for each individual work area established shall be consistent with the quantity of ACM contained within that work area as defined in ICR-56-2.
- E. The scope of work under this contract shall include the following:
  - 1. All asbestos-containing materials (ACM) shall be removed in accordance with these specifications. The Abatement Contractor is responsible for field verification of estimated quantities, locations and other site conditions that may affect work.
  - 2. All fixed objects remaining within the work area(s) shall be protected as required by Title 12 NYCRR Section 56-7.10(b) and as described in these specifications.
  - 3. The containerization, labeling and disposal of all asbestos waste in accordance with applicable city, state and federal regulations and these specifications.
  - 4. The Abatement Contractor will be responsible for repairing all building components damaged during abatement including, but not limited to, ceiling tiles, ceiling finishes, wall finishes and/or floor finishes, etc.
  - 5. The Abatement Contractor shall be responsible for any and all demolition required to access materials identified in scope of work and on associated drawings.
  - 6. Concealed conditions that are exposed and may require additional work shall be brought to the attention of the Owner(s) immediately. The Abatement Contractor shall not abate these areas without a written notice to proceed. If the Abatement Contractor removes additional asbestos prior to the order to proceed the additional work will not be acknowledged.



7. Permissible working hours shall be Monday through Friday 7:00 A.M. to 4:00 P.M. and/or as defined by the Owner(s) and/or Owner's Representative(s). Holidays shall be considered weekends and not included for working days. Upon written approval from the Owner, the Abatement Contractor may work past these hours. The Abatement Contractor will incur any and all costs associated for work performed beyond the defined schedule including, but not limited to: abatement activities, project/air monitoring, custodial/staffing labor, overtime, mobilizations, etc.
8. Buildings will be turned over to the Abatement Contractor as is. At that time, all electrical services and HVAC systems in the proposed work areas will be shut down. Electricity and water supply will be maintained in the building for use by the Abatement Contractor. The Abatement Contractor is responsible for securing all power in the work area(s) and establishing all temporary GFCI hookups necessary to complete his work.
9. The Abatement Contractor shall remove all identified Asbestos-containing Materials (ACM) to building substrate(s); in areas indicted. Subsequent to final air clearances, the substrate(s) shall be washed with a neutralizing agent to prepare the substrate to accept new floor covering and eliminate residual odors.
10. The Abatement Contractor must coordinate location of waste containers with the Facility and the Owner. Deliveries and storage of equipment must be coordinated with the Facility and the Owner.
11. All "Large" and "Small" asbestos abatement projects, as defined by 12 NYCRR56 shall not be performed while the building is occupied. The term "building" means a wing or major section of a building that can be completely isolated from the rest of the building with sealed non-combustible construction. The isolated portion of the building must contain exists that do not pass through the occupied portion(s) and ventilation systems must be physically separated and sealed at the isolation barriers.

## **1.02 PRE-CONTRACT SUBMITTALS**

Within three (3) days after bids are opened, the three (3) apparent low bidders shall be required to submit the following documentation:

A. Resume': Shall include the following:

1. Provide a list of projects of similar nature performed within the past two (2) years and include the dollar value of all projects. Provide project references to include owner, consultant, and air monitoring firms' name, contact person, address, and phone number, include location of project and date of completion.
2. Abatement Contractor license issued by New York State Department of Labor for asbestos work in accordance with ICR-56-3.
3. A list of owned equipment available to be used in the performance of the project.
4. The number of years engaged in asbestos removal.
5. An outline of the worker training courses, and medical surveillance program conducted by the Abatement Contractor.
6. A standard operating procedures manual describing work practices and procedures, equipment, type of decontamination facilities, respirator program, special removal techniques, etc.



7. Documentation to the satisfaction of the Owner pertaining to the Abatement Contractor's financial resources available to perform the project. Such data shall include, but not be limited to, the firm's balance sheet for the last fiscal year.

**B. Citations/Violations/Legal Proceedings**

1. Submit a notarized statement describing any citations, violations, criminal charges, or legal proceedings undertaken or issued by any law enforcement, regulatory agency, or consultant concerning performance on previous asbestos abatement contracts. Briefly describe the circumstances citing the project and involved persons and agencies as well as the outcome of any actions.
2. Answer the question: "Has your firm or its agents been issued a Stop Work order on any project within the last two years?" If "Yes" provide details as discussed above.
3. Answer the question: "Are you now, or have you been in the past, a party to any litigation or arbitrations arising out of your performance on Asbestos Abatement Contracts?" If "Yes" provide details as discussed in 1. above.
4. Describe any liquidated damages assessed within the last two years.

**C. Preliminary Schedule**

1. Provide a detailed schedule including work dates, work shift times, estimate of manpower to be utilized and the start and completion date for completion of each major work area.

**1.03 DOCUMENTATION**

- A. The Abatement Contractor shall be required to submit the following and receive the Consultant's approval prior to commencing work on this project:**
1. Provide documentation of worker training for each person assigned to the project. Documentation shall include copies of each workers valid New York State asbestos handler certificates (for those employees who may perform asbestos removal), documentation of current respirator fit test and current OSHA required training and medical examination.
  2. The attached "Asbestos Employee Medical Examination Statement" and "Asbestos Employee Training Statement" forms shall be completed, signed and submitted for each worker assigned to the project. Records of all employee training and medical surveillance shall be maintained for at least forty (40) years. Copies of the records shall be submitted to the Consultant prior to commencement.
  3. The Abatement Contractor shall submit proof of a current, valid license issued by the New York State Department of Labor pursuant to the authority vested in the Commissioner by section 906 of the Labor Laws, and that the employees performing asbestos related work on this project are certified by the State of New York as required in Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York latest edition. Copies of all licenses shall be submitted prior to the commencement of the project.
  4. The Abatement Contractor shall submit a written respiratory protection program meeting the requirements of 29 CFR 1910.134 to the Consultant.
  5. The name, address, social security number and NYS DOL certificate number of the person(s) who will supervise the asbestos project.



6. The name and address of the deposit or waste disposal site or sites where the asbestos materials are to be deposited or disposed of. This site must be approved by the Owner. The manifesting procedure must also be specified.
  7. The name, address and New York State Dept. of Environmental Conservation ID Number of any transporters that are to be used to transport waste.
  8. A written Standard Operation Procedure (SOP) that is designed and implemented to maximize protection against human exposure to asbestos dust. The SOP shall take into consideration the workers, visitors, building employees, general public and environment. As a minimum the procedures must include the following:
    - a. Security for all work areas on an around-the-clock basis against unauthorized access.
    - b. Project organization chart including the phone numbers of at least two responsible persons who shall be authorized to dispatch men and equipment to the project in the event of an emergency; including weekends.
    - c. Description of protective clothing and NIOSH approved respirators to be used.
    - d. Description of all removal methods to be used, including HEPA air filtration and decontamination sequence with special emphasis on any procedure that may deviate from these specifications.
    - e. A list of manufacturers' certificates stating that all vacuums, negative air filtration equipment, respirators and air supply equipment meet OSHA and EPA requirements.
    - f. A list of all materials proposed to be furnished and used under this contract.
    - g. Emergency evacuation procedures in the event of fire, smoke or accidents such as injury from falling, heat exposure, electrical shock, etc.
    - h. The name, address and ELAP number of the New York State Department of Health Certified Analytical Testing Laboratory the Contractor proposes to use for the OSHA monitoring.
  9. A detailed plan, in triplicate, for the phasing of the project, division of work areas and location of decontamination facilities, waste containers and temporary office.
  10. Work schedule, identifying firm dates and completion for actual areas. Bar chart or critical path chart indicating phases is required.
- B. The Abatement Contractor shall post their NYS DOL contractor's license and maintain a daily log documenting the dates and time of the following items within each personal decontamination unit:
1. Meetings; purpose, attendants, discussion (brief)
  2. Sign-in and sign-out of all persons entering the work area including name, date, time, social security number, position or function and general description of daily activity.
  3. Testing of barriers and enclosure systems using smoke tubes prior to the beginning of abatement activities and at least once a day thereafter until satisfactory clearance air monitoring results have been achieved.
  4. Inspection of all plastic barriers, twice daily, by the asbestos supervisor.



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5. Loss of enclosure integrity; special or unusual events, barrier breaches, equipment failures, etc.
  6. Daily cleaning of enclosures.
  7. Personnel air monitoring test results for OSHA Compliance. Results shall be posted at the work site within 24 hours of testing and copies supplied to the Owner within five (5) days of testing. Abnormalities shall be supplied to the Owner immediately.
- C. Documentation with confirmation signature of Consultant's representative of the following shall be provided by the Abatement Contractor at the final closeout of the project.
1. Testing of barriers and enclosure systems using smoke tubes shall be performed prior to the beginning of abatement activities and at least once a day thereafter until satisfactory clearance air monitoring results have been achieved.
  2. Inspection of all plastic barriers.
  3. Removal of all polyethylene barriers.
  4. Consultant's inspections prior to encapsulation.
  5. Removal of waste materials.
  6. Decontamination of equipment (list items).
  7. Consultant's final inspection/final air tests.
- D. The Abatement Contractor shall provide records of all project information, to include the following which shall be submitted upon completion of the project and prior to approval of the Abatement Contractor's payment application:
1. The location and description of the abatement project.
  2. The name, address and social security number of the person(s) who supervised the asbestos project.
  3. Certified payroll documentation Pursuant to Article 8, Section 220 of the NYS Labor Law
  4. Copies of EPA/NYS DOL Asbestos Certificates for all Workers and Supervisors employed on the Project.
  5. Copies of Medical Approval and Respirator Fit Testing for all Asbestos Workers and Supervisors employed on the Project.
  6. Copies of Abatement Contractors Daily Sign-In Sheets & Logs for persons entering and leaving the work area. – Title 12 NYCRR Part 56-7.3.
  7. Copies of Abatement Contractor's personal air sampling laboratory results.
  8. The amounts and type of asbestos materials that was removed, enclosed, encapsulated, or disturbed.
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9. The name and address of the deposit or waste disposal site or sites where the asbestos waste materials were deposited or disposed of and all related manifests, receipts and other documentation associated with the disposal of asbestos waste.
10. The name and address of any transporters used to transport waste and all related manifests, receipts and other documentation associated with the transport of asbestos waste.
11. All other information that may be required by state, federal or local regulations.
12. Copy of the Supervisor's Daily Project Log of events as described in 1.03 B, above.

#### **1.04 NOTIFICATIONS AND PERMITS**

- A. The Abatement Contractor shall be required to prepare and submit notifications to the following agencies at least ten (10) days prior to the commencement of the project:

1. Asbestos NESHAPS Contact  
U.S. Environmental Protection Agency  
NESHAPS Coordinator, Air Facilities Branch  
26 Federal Plaza  
New York, New York 10007  
(212) 264-7307
2. State of New York Department of Labor  
Division of Safety and Health  
Asbestos Control Bureau  
State Office Building Campus, Building 12, Room 454  
Albany, New York 12240
3. Owner(s): Poughkeepsie CSD  
18 South Perry Street  
Poughkeepsie, NY 12601  
ATTN: Marcos Rodriguez, Director of Facilities  
Ph. (845) 451-4900 X4996  
E-mail. [mrodriguez@poughkeepsieschools.org](mailto:mrodriguez@poughkeepsieschools.org)
4. Environmental Consultant(s): Quality Environmental Solutions & Technologies, Inc. (QuES&T)  
1376 Route 9  
Wappingers Falls, New York 12590  
ATTN: Rudy Lipinski, Director of Field Operations  
Ph. (845) 298-6031  
Fx. (845) 298-6251  
E-mail. [rlipinski@qualityenv.com](mailto:rlipinski@qualityenv.com)

- B. The notification shall include but not be limited to the following information:

1. Name and address of Owner.
2. Name, address and asbestos handling license number of the Abatement Contractor.
3. Address and description of the building, including size, age, and prior use of the building or area; the amount, in square feet or linear feet of asbestos material to be removed; room designation numbers or other local information where asbestos material is found, including the type of asbestos material (friable or non-friable).



4. Scheduled starting and completion dates for removal.
5. Methods to be employed in abating asbestos containing materials.
6. Procedures and equipment, including ventilating/exhaust systems, that will be employed to comply with the Code of Federal Regulation (CFR) Title 40, Part 61 of the U.S. Environmental Protection Agency.
7. The name and address of the carting company and of the waste disposal site where the asbestos waste will be deposited.

**NOTE:** Notifications shall be submitted using standard forms as may be used by the respective agency.

For DOL (NYS) include "Asbestos Project Notification" form (DOSH-483) with proper fee, if required. For EPA include "Notification of Demolition and Renovation"; 40 CFR Part 61.

- C. The Abatement Contractor shall secure any permits required by the city, town, county, or state that may be required and the cost for obtaining the permit shall be included in his base bid.
- D. The Abatement Contractor shall erect warning signs around the work space at every point of potential entry into the work area in accordance with OSHA 1926.58k (2), (i). These signs shall bear the following information:

**DANGER**  
**CANCER AND LUNG DISEASE HAZARD**  
**AUTHORIZED PERSONNEL ONLY**  
**RESPIRATORS AND PROTECTIVE**  
**CLOTHING**  
**ARE REQUIRED IN THIS AREA**

- E. The Abatement Contractor shall post at entrances to the work place and immediate adjacent areas, notifications to building occupants which include the name and license number of the contractor, project location and size, amount and type of ACM, abatement procedures, dates of expected occurrence and name and address of the air monitor and laboratory in compliance with ICR 56-3.6.
- F. The Abatement Contractor shall post a list of emergency telephone numbers at the job site which shall include the Owner's Representative, police, emergency squad, local hospital, Environmental Protection Agency, N.Y. State Department of Labor, Occupational Safety and Health Administration and the local Department of Health.

#### **1.05 APPLICABLE STANDARDS**

Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, applicable standards of the construction industry have the same force and effects (and are made a part of contract documents by reference) as if copied directly into contract documents, or as if published copies were bound herewith. Resolution of overlapping and conflicting requirements, which result from the application of several different industry standards to the same unit of work, shall be by adherence to the most stringent requirement.



A. Applicable standards listed in these Specifications form a part of this Specification and include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

1. ANSI:  
American National Standards Institute  
1430 Broadway  
New York, New York 10018
2. ASHRAE:  
American Society for Heating, Refrigerating  
and Air Conditioning Engineers  
1791 Tullie Circle NE  
Atlanta, Georgia 30329
3. ASTM:  
American Society for Testing and Materials  
1916 Race Street  
Philadelphia, Pennsylvania 19103
4. CFR  
Code of Federal Regulations Available  
from Government Printing Office  
Washington, District of Columbia 20402
5. CGA  
Compressed Gas Association  
1235 Jefferson Davis Highway  
Arlington, Virginia 22202
6. CS  
Commercial Standard of NBS  
(US Dept. of Commerce)  
Government Printing Office
7. EPA  
Environmental Protection Agency, Region II  
26 Federal Plaza  
New York, New York 10007  
Asbestos Coordinator - Room 802  
(212) 264-9538  
Part 61, Sub-Parts A & B  
National Emission Standard for Asbestos
8. FEDERAL SPECS  
Federal Specification (General Services Administration)  
7th and D Street, SW  
Washington, District of Columbia 20406
9. NBS  
National Bureau of Standards  
(US Department of Commerce)  
Gaithersburg, Maryland 20834
10. NEC  
National Electrical Code (by NFPA)



11. NFPA

National Fire Protection Association  
Batterymarch Park  
Quincy, Massachusetts 02269

12. NIOSH

National Institute for Occupational Safety and Health  
26 Federal Plaza  
New York, New York 10007

13. NYSDOH

New York State Department of Health  
Bureau of Toxic Substance Assessment  
Room 359 - 3rd Floor  
Tower Building Empire State Plaza  
Albany, New York 12237

14. NYSDEC

New York State Department of Environmental Conservation  
Room 136  
50 Wolf Road  
Albany, New York 12233-3245

15. NYSDOL

State of New York Department of Labor  
Division of Safety and Health  
Asbestos Control Program  
State Campus  
Building 12  
Albany, New York 12240

16. OSHA

Occupational Safety and Health Administration  
(US Department of Labor)  
New York Regional Office - room 3445  
1515 Broadway  
New York, New York 10036

17. UL

Underwriters Laboratories  
333 Pfingsten Road  
Northbrook, Illinois 60062

B. Federal Regulations: Those which govern asbestos abatement work or hauling and disposal of asbestos waste materials:

1. U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA):

a. Asbestos Regulations

Title 29, Part 1910, of the Code of Federal Regulations.

b. Respiratory Protection

Title 29, Part 1910, Section 134 of the Code of Federal Regulations.



- c. Construction Industry  
Title 29, Part 1926, of the Code of Federal Regulations.
  - d. Access to Employee Exposure & Medical Records  
Title 29, Part 1910, Section 20 of the Code of Federal Regulations.
  - e. Hazard Communication  
Title 29, Part 1910, Section 1200 of the Code of Federal Regulations.
  - f. Specifications for Accident Prevention Signs and Tags  
Title 29, Part 1910, section 145 of the Code of Federal Regulations.
2. U.S. Environmental Protection Agency (EPA):
- a. Asbestos Hazard Emergency Response Act (AHERA) Regulation Asbestos Containing Materials in Schools Final Rule & Notice Title 40, Part 763, Subpart E of the Code of Federal Regulations.
  - b. Worker Protection Rule  
40 CFR Part 763, Subpart G, CPTS 62044, FLR 2843-9  
Federal Register, Vol. 50, No. 134, 7/12/85, P28530-28540
  - c. Regulation for Asbestos  
Title 40, Part 61, Subpart A of the Code of Federal Regulations
  - d. National Emission Standard for Asbestos  
Title 40, Part 61, Subpart M (Revised Subpart B) of the Code of Federal Regulations
  - e. Resource Conservation and Recovery Act (RCRA) 1976, 1980  
Hazardous and Solid Waste Amendments (HSWA) 1984  
Subtitle D, Subtitle C
3. U.S. Department of Transportation (DOT):
- a. Hazardous Substances: Final Rule Regulation 49 CFR, Part 171 and 172.
- C. State Regulations: Those which govern asbestos abatement work or hauling and disposal of asbestos waste materials:
- 1. New York State Department of Environmental Conservation (DEC) Regulations regarding waste collection registration. Title 6, Part 364 of the New York State Official Compilation of Codes, Rules and Regulations - 6NYCRR 364.
  - 2. New York State Right-To-Know Law
  - 3. New York State Department of Labor Asbestos Regulations Industrial Code Rule 56.
  - 4. New York State Department of Health, Title 10 Part 73 Asbestos Safety Program Requirements.
- D. Standards: Those which govern asbestos abatement work or hauling and disposal of asbestos waste materials:
- 1. American National Standards Institute (ANSI)
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- a. Fundamentals Governing the Design and Operation of Local Exhaust Systems  
Publication Z9.2-79
  - b. Practices for Respiratory Protection  
Publication Z88.2-80
  - E. Guidance Documents: Those that discuss asbestos abatement work or hauling, and disposal of asbestos waste materials are listed below only for the Abatement Contractor's information. These documents do not describe the work and are not a part of the work of this contract.
- EPA:
- 1. Guidance for Controlling Asbestos Containing Materials in Buildings (Purple Book)  
EPA560/5-85-024.
  - 2. Asbestos Waste Management Guidance EPA 530-SW-85-007.
- F. Patents and Royalties: The Abatement Contractor shall pay all royalties and/or license fees. The Abatement Contractor shall defend all suits and claims for infringement of any patent rights and save the Owner and Consultant harmless from loss including attorney fees on account thereof.

## 1.06 DEFINITIONS

As used in or in connection with these specifications the following are terms and definitions.

**Abatement** - Procedure to control release from asbestos material. This includes removal, encapsulation and enclosure.

**Aggressive sampling** - A method of sampling in which the person collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.

**AIHA** - The American Industrial Hygiene Association, 475 Wolf Ledges Parkway, Akron, Ohio 44311.

**Airlock** - A system for permitting entrance and exit while restricting air movement between a containment area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

**Air sampling** - The process of measuring the content of a known volume of air collected during a specific period of time.

**Amended water** - Water to which a surfactant has been added.

**Approved asbestos safety program** - A program approved by the Commissioner of Health providing training in the various disciplines that may be involved in an asbestos project.

**Area air sampling** - Any form of air sampling or monitoring where the sampling device is placed at some stationary location.



**Asbestos** - Any naturally occurring hydrated mineral silicate separable into commercially usable fibers, including chrysotile (serpentine), amosite (cumingtonite-gunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.

**Asbestos contract** - An oral or written agreement contained in one or more documents for the performance of work on an asbestos project and includes all labor, goods and service.

**Asbestos handler** - An individual who installs, removes, applies, encapsulates, or encloses asbestos or asbestos material, or who disturbs friable asbestos. Only individuals certified by NYS Department of Labor shall be acceptable for work under this specification.

**Asbestos handling certificate** - A certificate issued by the Commissioner of Labor of the State of New York, to a person who has satisfactorily completed an approved asbestos safety program.

**Asbestos project** - Work undertaken by a contractor which involves the installation, removal, encapsulation, application or enclosure of any ACM or the disturbance of friable ACM.

**Asbestos Safety Technician (AST)** - Individual designated to represent the Consultant, perform third party monitoring and perform compliance monitoring at the job site during the asbestos project.

**Asbestos waste material** - Asbestos material or asbestos contaminated objects requiring disposal.

**Authorized visitor** - The building owner, his or her representative or any representative of a regulatory or other agency having jurisdiction over the project.

**Background level monitoring** - A method used to determine ambient airborne concentrations inside and outside of a building or structure prior to starting an abatement project.

**Building owner** - The person in whom legal title to the premises is vested unless the premises are held in land trust, in which instance Building Owner means the person in whom beneficial title is vested.

**Clean room** - An uncontaminated area or room that is a part of the personal decontamination enclosure with provisions for storage of persons' street clothes and protective equipment.

**Cleanup** - The utilization of HEPA vacuuming to control and eliminate accumulations of asbestos material and asbestos waste material.

**Clearance air monitoring** - The employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers upon conclusion of an asbestos abatement project.

**Commissioner** - Commissioner of the New York State Department of Labor.

**Contractor** - A company, unincorporated association, firm, partnership or corporation and any owner or operator thereof, which engages in an asbestos project or employs persons engaged in an asbestos project.



**Curtained doorway** - A device that consists of at least three overlapping sheets of plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and the left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.

**Decontamination enclosure system** - A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of persons, materials, equipment, and authorized visitors.

**Encapsulant (sealant) or encapsulating agent** - A liquid material that can be applied to asbestos material and which prevents the release of asbestos from the material by creating a membrane over the surface.

**Enclosure** - The construction of airtight walls, ceilings and floors between the asbestos material and the facility environment, or around surfaces coated with asbestos materials, or any other appropriate procedure that prevents the release of asbestos materials.

**Equipment room** - A contaminated area or room that is part of the personal decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.

**Fixed object** - A unit of equipment, furniture or other fixture in the work area which cannot be readily removed from the work area.

**Friable Asbestos Material** - That condition of crumbled, pulverized, powdered, crushed or exposed asbestos capable of being released into the air by hand pressure.

**Friable material containment** - The encapsulation or enclosure of any friable asbestos material.

**Glovebag technique** - A method for removing asbestos material from heating, ventilating, and air conditioning (HVAC) ducts, piping runs, valves, joints, elbows, and other nonplanar surfaces in a noncontained work area. The glovebag assembly is a manufactured device consisting of a glovebag constructed of at least six mil transparent plastic, two inward-projecting longsleeve gloves, which may contain an inward projecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle or portion for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and to contain all asbestos fibers released during the abatement process.

**HEPA filter** - A high efficiency particulate air filter capable of trapping and retaining 99.97 percent of particulate greater than 0.3 microns equivalent aerodynamic diameter.

**HEPA vacuum equipment** - Vacuuming equipment with a high efficiency particulate air filtration system.

**Holding area** - A chamber in the waste decontamination enclosure located between the washroom and an adjacent uncontaminated area.

**Homogeneous work area** - A site within the abatement work area that contains one type of asbestos material and where one type of abatement is used.

**Large asbestos project** - An asbestos project involving the installation, removal, disturbance, enclosure, or encapsulation of 160 square feet or more of asbestos or asbestos material or 260 linear feet or more of asbestos or asbestos material.



**Minor asbestos project** - An asbestos project involving the installation, removal, disturbance, enclosure, or encapsulation of 10 square feet or less of asbestos or asbestos material, or 25 linear feet or less of asbestos or asbestos material.

**Movable object** - A unit of equipment, furniture or fixture in the work area that can be readily removed from the work area.

**Negative air pressure equipment** - A local exhaust system equipped with HEPA filtration. The system shall be capable of creating and maintaining a negative pressure differential between the outside and the inside of the work area.

**Non-asbestos material** - Any material containing one percent or less asbestos by weight.

**Occupied area** - Any frequented portion of the work site where abatement is not taking place.

**Outside air** - The air outside the building or structure.

**Personal air monitoring** - A method used to determine an individual's exposure to airborne contaminants. The sample is collected outside the respirator in the person's breathing zone.

**Plasticize** - To cover floors, walls, ceilings and other surfaces with 6 mil fire retardant plastic sheeting as herein specified.

**Project** - Any form of work performed in connection with the abatement of asbestos or alteration, renovation, modification or demolition of a building or structure that may disturb asbestos or asbestos material.

**Removal** - The stripping of any asbestos material.

**Repair** - Corrective action using required work practices to control fiber release from damaged areas.

**Respiratory protection** - Respiratory protection required of licensed asbestos workers and authorized visitors in accordance with the applicable laws.

**Satisfactory clearance air monitoring results** - For all post- abatement samples, airborne concentrations of total fibers that are less than 0.01 fibers per cubic centimeter or background levels, whichever are greater, using phase contrast microscopy (PCM).

**Shower room** - A room between the clean room and the equipment room in the personal decontamination enclosure with hot and cold running water controllable at the top and arranged for complete showering during decontamination.

**Small asbestos project** - An asbestos project involving the installation, removal, disturbances, enclosure, or encapsulation of more than 10 and less than 160 square feet of asbestos or asbestos material of more than 25 and less than 260 linear feet of asbestos or asbestos material.

**Staging area** - The area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.

**Surfactant** - A chemical wetting agent added to water to improve its penetration.



**Visible emissions** - An emission of particulate material that can be seen without the aid of instruments.

**Washroom** - A room between the work area and the holding area in the waste decontamination enclosure system, where equipment and waste containers are wet cleaned and/or HEPA vacuumed.

**Waste decontamination enclosure system** - An area, consisting of a washroom and a holding area, designated for the controlled transfer of materials and equipment.

**Wet cleaning** - The process of eliminating asbestos contamination from surfaces, equipment or other objects by using cloths, mops, or other cleaning tools.

**Work area** - Designated rooms, spaces, or areas where asbestos abatement takes place.

**Work site** - Premises where asbestos abatement is taking place.

**Work Surface** - Substrate surface from which asbestos-containing material has been removed.

#### **1.07 UTILITIES, SERVICE AND TEMPORARY FACILITIES**

- A. The Owner shall make available to the Abatement Contractor all reasonable amounts of water and electrical power at no charge.
- B. The Abatement Contractor shall provide, at his own expense, all electrical, water, and waste connections, extensions, and construction materials, supplies, etc. All connections must be approved in advance by the Owner and all work relative to the utilities must be in accordance with the applicable building codes.
- C. The Abatement Contractor shall provide scaffolding, ladders and staging, etc. as necessary to accomplish the work of this contract. The type, erection and use of all scaffolding, ladders and staging, etc. shall comply with all applicable OSHA provisions.
- D. All connections to the Owner's water system shall include reduced pressure backflow protection or double check and double gate valves. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment.
- E. The Abatement Contractor shall use only heavy-duty abrasion resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water to each work area and to each decontamination unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment. All water must be shut off at the end of each shift.
- F. The Abatement Contractor shall provide service to decontamination unit electrical subpanel with minimum 60-amp, 2 pole circuit breaker or fused disconnect and ground-fault circuit interrupters (GFCI), reset button and pilot light, connected to the building's main distribution panel. Subpanel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work. This electrical subpanel shall be used for hot water heater, PAPR battery recharging and air sampling pumps.



- G. The Abatement Contractor shall provide UL rated 40-gallon electric hot water heater to supply hot water for the decontamination unit shower. Activate from 30-amp circuit breaker on the electrical subpanel located within the decontamination unit. Provide with relief valve compatible with water heater operation, relief valve down to drip pan on floor with type L copper. Wiring of the hot water heater shall follow NEMA, NEC, and UL standards.
- H. The Abatement Contractor shall provide identification warning signs at power outlets, which are other than 110-120-volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 plugs into higher voltage outlets. Dry transformers shall be provided where required to provide voltages necessary for work operations. All outlets or power supplies shall be protected by ground fault circuit interrupter (GFCI) at the power source.
- I. The Abatement Contractor shall use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas of work.
- J. The Abatement Contractor shall provide general service incandescent lamps of wattage indicated or required for adequate illumination; Protect lamps with guard cages or tempered glass enclosures; Provide exterior fixtures where fixtures are exposed to moisture.
- K. The Abatement Contractor shall provide temporary heat or air conditioning as necessary to maintain comfortable working temperatures inside and immediately outside the work areas. Heating and A/C equipment shall have been tested and labeled by UL, FM or another recognized trade association related to the fuel being used. Fuel burning heaters shall not be used inside containment areas. The Contractor shall also provide a comfortable working environment for occupied areas that are impacted by the asbestos removal.
- L. The Abatement Contractor shall comply with recommendations of the NFPA standard in regard to the use and application of fire extinguishers. Locate fire extinguishers where they are most convenient and effective for their intended purpose but provide not less than one extinguisher in each work area, equipment room, clean room and outside the work area.

## **1.08 REMOVAL OF FIXTURES**

- A. In locations where the Abatement Contractor is directed to dispose of fixtures, he shall either decontaminate the fixtures and dispose of them as non-asbestos containing materials or he shall place them in an appropriate container and dispose of them as asbestos containing material.
- B. In locations where the Abatement Contractor is directed to remove and reinstall fixtures, the fixtures shall be removed, decontaminated, labeled, protected with plastic and stored by the contractor in a location as directed by the Owner.
- C. Upon completion of the asbestos removal and upon receiving satisfactory clearance air monitoring results, all items to be replaced shall be restored to their original location and reinstalled by the Abatement Contractor.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS AND EQUIPMENT**

#### **A. GENERAL REQUIREMENTS**

- 1. Materials shall be stored off the ground, away from wet or damp surfaces and under protective cover to prevent damage or contamination.



2. Damaged or deteriorating materials shall not be used and shall be removed from the premises.
3. Power tools used to drill, cut into, or otherwise disturb asbestos material shall be equipped with HEPA filtered local exhaust ventilation.
4. The Abatement Contractor shall make available to authorized visitors, ladders and/or scaffolds of sufficient dimension and quantity so that all work surfaces can be easily and safely reached for inspection. Scaffold joints and ends shall be sealed with tape to prevent incursion of asbestos. Scaffolds and ladders shall comply with all applicable codes.

**B. PLASTIC BARRIERS (POLYETHYLENE)**

1. In sizes and shapes to minimize the number of joints.
  - a. Six mil. (.006") fire-retardant for vertical protection (walls, entrances and openings).
  - b. Six mil. (.006") fire-retardant for horizontal protection (fixed equipment) and heating grilles.
  - c. Six mil. (.006") reinforced fire-retardant for floors of decon units.
2. Provide two (2) layers over all roof, wall and ceiling openings. Floor penetrations shall be sealed with a rigid material prior to plasticizing to prevent tripping and fall hazards. All seams within a layer shall be separated by a minimum distance of six feet and sealed airtight. All seams between layers shall be staggered.
3. Barrier Attachment - Commercially available duct tape (fabric or paper) and spray-on adhesive. Duct tape shall be capable of sealing joints of adjacent sheets of plastic, facilitating attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials and adhering under both dry and wet conditions.

**C. SIGNS**

1. Danger signs shall be provided and shall conform to 29 CFR 1926.1101 and be 14" x 20". These signs shall bear the following information:

**DANGER  
ASBESTOS  
CANCER AND LUNG DISEASE HAZARD  
RESPIRATORS AND PROTECTIVE  
CLOTHING  
ARE REQUIRED IN THIS AREA**

**D. DANGER LABELS AND TAPE**

1. Labels shall be affixed to any asbestos contaminated material in accordance with the requirements of 29 CFR 1910.1200 (f) of OSHA's Hazard Communication Standard, and shall contain the following information:



**DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID BREATHING DUST  
CANCER AND LUNG DISEASE HAZARD**

2. A label shall be affixed on each container of asbestos waste in accordance with the requirements of 49 CFR Parts 171 and 172, Hazardous Substances; Final Rule (U.S. Department of Transportation), and shall contain the following information:

**RQ HAZARDOUS SUBSTANCE  
SOLID, NOS, ORM-E, NA 9188  
(ASBESTOS)**

3. A label shall be affixed on each container of asbestos waste in accordance with the requirements of 40 CFR Part 61.150, NESHAP; Asbestos; Final Rule (USEPA) and shall contain the name of the waste generator and the location at which the waste was generated.  
NOTE: All containers marked as above (1,2 and 3) shall be disposed of as asbestos waste.
4. Provide 3" red barrier tape printed with black lettered "DANGER ASBESTOS REMOVAL". Locate barrier tape across all corridors, entrances and access routes to asbestos work area.

#### E. PROTECTIVE EQUIPMENT

##### 1. Respiratory Requirements

- a. Where fiber levels permit, and in compliance with regulatory requirements, Powered Air Purifying Respirators are the minimum allowable respiratory protection permitted to be utilized during removal operations.
- b. Where not in violation of NIOSH, OSHA, and any other regulatory requirements, the Abatement Contractor shall provide the following minimum respiratory protection to the maximum use concentrations indicated:

<u>MSHA/NIOSH Approved Respiratory Protection</u>	<u>Maximum Use Concentration</u>
Half-Mask Air Purifying with HEPA Filters	10x PEL
Full-Facepiece Air Purifying HEPA Filters and Quantitative Fit Test	10x PEL
Powered Air Purifying (PAPR), Loose fitting Helmet or Hood, HEPA Filter	25x PEL
Powered Air Purifying (PAPR), Full Facepiece, HEPA Filter	50x PEL



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Supplied Air, Continuous Flow Loose fitting Helmet or Hood	25x PEL
Supplied Air, Continuous Flow Full Facepiece, HEPA Filter	50x PEL
Full Facepiece-Supplied Air Pressure Demand, HEPA Filter	100x PEL
Full Facepiece-Supplied Air Pressure Demand, with Aux. SCBA, Pressure Demand or Continuous Flow	>100x PEL

2. Disposable Clothing -"Tyvek" manufactured by Dupont or approved equal.
3. NIOSH approved safety goggles to protect eyes.
4. Polyethylene bags, 6 mil. (.006") thick (use double bags).

NOTE: Workers must always wear disposable coveralls and respirator masks while in the work area. Contaminated coveralls or equipment must be left in work area and not worn into other parts of the building.

#### F. TOOLS AND EQUIPMENT

1. Airless Sprayer - An airless sprayer, suitable for application of encapsulating material, shall be used.
2. Scaffolding - Scaffolding, as required to accomplish the specified work, shall meet all applicable safety regulations.
3. Transportation Equipment - Transportation equipment, as required, shall be suitable for loading, temporary storage, transport and unloading of contaminated waste without exposure to persons or property. Watertight, hard wall containers shall be provided to retain and dispose of any asbestos waste material with sharp-edged components that may tear plastic bags or sheeting. The containers shall be marked with danger labels.
4. Surfactant - Wetting Agents - "Asbestos-Wet" - Aquatrols Corp. of America or approved equal and shall be non-carcinogenic.
5. Portable (negative air pressure) asbestos filtration system - by Micro-Trap or approved equal.
6. Vacuum, HEPA type equal to "Nilfisk" #GA73, or "Pullman/Holt" #75 ASA.
7. Amended Water Sprayer - The water sprayer shall be an airless or other low-pressure sprayer for amended water application.
8. Other Tools and Equipment - The Abatement Contractor shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: hand-held scrapers, nylon brushes, sponges, rounded edge shovels, brooms, and carts.



### **PART 3 – EXECUTION**

#### **3.01 PRE-ABATEMENT WORK AREA PREPARATION**

- A. The work area shall be vacated by the occupants prior to work area preparation and not reoccupied until satisfactory clearance air monitoring results have been achieved.
- B. Caution signs shall be posted at all locations and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted that permit a person to read the sign and take the necessary protective measures to avoid exposure.
- C. Shut down and lock out electric power to all work areas. The Abatement Contractor shall provide temporary power and lighting and ensure safe installation of temporary power sources and equipment used where high humidity and/or water shall be sprayed in accordance with all applicable codes. All power to work areas shall be brought in from outside the area through a ground-fault interrupter at the source.
- D. Isolate the work area HVAC system.
- E. The personnel decontamination enclosure system shall be installed or constructed prior to preparatory work in the work area and in particular before the disturbance of asbestos material. The waste decontamination enclosure system shall be installed or constructed prior to commencement of abatement activities.
- F. Movable objects within the work area shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning and such objects shall be removed from the work area to an uncontaminated location. If disposed of as asbestos waste material, cleaning is not required.
- G. Fixed objects and other items, which are to remain within the work area, shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning. Such objects shall be enclosed with two layers of at least six mil plastic sheeting and sealed with tape.
- H. The work area shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall be prohibited. Asbestos material shall not be disturbed during pre-cleaning.
- I. Isolation barriers that seal off all openings, including windows, corridors, doorways, ducts, and any other penetrations of the work area, shall be constructed using two layers of at least six mil fire-retardant plastic sheeting sealed with tape. Also, all seams in mechanical system components that pass through the work area shall be sealed. Doorways and corridors, which shall not be used for passage during work, shall also be sealed.
- J. Removal of mounted objects. After isolation barriers are in place, objects such as light fixtures, electrical track, alarm systems, ventilation equipment and other items not previously sealed, shall be double sealed with six mil fire-retardant plastic sheeting. Localized HEPA filtered vacuum equipment shall be used during fixture removal to reduce asbestos dispersal.
- K. Individual roof and floor drains shall be sealed watertight using two layers of 6-mil fire-retardant plastic sheeting and tape prior to plasticizing. Openings in floor shall be fully covered with plywood sheeting secured to the floor in such a way as to minimize a tripping hazard prior to plasticizing.
- L. Emergency and fire exits from the work area shall be maintained or alternate exits shall be established according to all applicable codes.



- M. Adequate toilet facilities shall be supplied by the Abatement Contractor and shall be located either in the clean area of the personnel decontamination enclosure or shall be readily accessible to the personnel decontamination enclosure.

**3.02 LARGE ASBESTOS PROJECT PERSONNEL DECONTAMINATION ENCLOSURE SYSTEM  
(ICR 56-7.5)**

- A. The personnel decontamination enclosure shall be constructed prior to preparatory work in the work area and in particular before the disturbance of asbestos material.
1. Construction and use of personnel decontamination enclosure systems shall be in accordance with ICR-56 and any Applicable or Site-Specific Variances utilized on this project. Such systems may consist of existing rooms outside of the work area, if the layout is appropriate, that can be enclosed is plastic sheeting and are accessible from the work area. When this situation does not exist, enclosure systems may be constructed out of metal, wood or plastic support.
  2. The personnel decontamination enclosure system shall consist of a clean room, a shower room, and an equipment room, in series, separated from each other and from the work area by three airlocks.
  3. There shall be one shower per six full shift abatement persons calculated on the basis of the largest shift.
  4. The personnel decontamination enclosure system shall be fully framed, sheathed for safety and constructed to prevent unauthorized entry.
  5. Personnel decontamination enclosure systems constructed at the work site shall utilize at least six mil fire-retardant opaque plastic sheeting. At least two layers of six mil fire-retardant reinforced plastic sheeting shall be used for the flooring of this area.
  6. All prefabricated decontamination units shall be completely decontaminated and sealed prior to separation and removal from the work area. Mobile decontamination units shall remain in place until satisfactory clearance results have been attained.
  7. The clean room shall be sized to accommodate all authorized persons. Benches, lockers and hooks shall be provided for street clothes. Shelves for storing respirators shall also be provided. Clean clothing, replacement filters for respirators, towels and other necessary items shall be provided. The clean room shall not be used for the storage of tools, equipment or materials. It shall not be used for office space. A lockable door shall be provided to permit access to the clean room from outside the work area or enclosure. It shall be used to secure the work area and decontamination enclosure during off-shift hours.
  8. The shower room shall contain one or more showers. Each shower head shall be supplied with hot and cold water adjustable at the tap. The shower enclosure shall be constructed to ensure against leakage of any kind. Uncontaminated soap, shampoo and towels shall be available at all times. Shower water shall be drained, collected and filtered through a system with at least 5.0 micron particle size collection capability. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtration system by large particles. Filtered wastewater shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestos waste. The shower room shall be constructed in such way that travel through the decontamination unit shall be through the shower.



9. The equipment room shall be used for the storage of equipment and tools after decontamination using a HEPA filtered vacuum and/or wet cleaning. A one day supply of replacement filters, in sealed containers, for HEPA vacuums and negative pressure ventilation equipment, extra tools, containers of surfactant and other materials and equipment that may be required during the abatement project may also be stored here. A walk-off pan filled with water shall be located in the work area just outside the equipment room for persons to clean foot covering when leaving the work area. A drum lined with a labeled, at least six mil plastic bag is required for collection of clothing and shall be located in this room. Contaminated footwear and work clothes shall be stored in this area.

### **3.03 WASTE DECONTAMINATION ENCLOSURE SYSTEM (ICR 56-7.5)**

#### **A. General Requirements**

1. A waste decontamination enclosure system shall consist of the following:
  - a. A washroom/cleanup room shall be constructed with an airlock doorway to the work area and another airlock doorway to the holding area.
  - b. The holding area shall be constructed with an airlock doorway to the washroom/cleanup room and another lockable door to the outside.
2. Where there is only one egress from the work area, the holding area of the waste decontamination enclosure system may branch off from the equipment decontamination room, which doubles as a waste washroom, of the personnel decontamination enclosure.
3. The waste washroom shall be equipped with a drain installed to collect water and deliver it to the shower drain where it shall be filtered through a system with at least 5.0 micron particle size collection capability. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtration system by large particles. Filtered wastewater shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestos waste.
4. The waste washroom shall be constructed in such a way that travel through the rooms shall be through the waste washroom

### **3.04 WORK AREA ENTRY AND EXIT PROCEDURES**

- #### **A. The following procedures shall be followed throughout the asbestos abatement project until satisfactory clearance air monitoring results have been achieved:**
1. All persons shall enter and exit the work area through the personnel decontamination enclosure system.
  2. All persons who enter the work area or an enclosure shall sign the entry/exit log, located in the clean room, upon every entry and exit.
  3. All persons, before entering the work area, or an enclosure shall read and be familiar with all posted regulations, personal protection requirements, including work area entry and exit procedures, and emergency procedures. The entry/exit log headings shall indicate, and the signatures shall be used to acknowledge, that these have been reviewed and understood by all persons prior to entry.



4. All persons shall proceed first to the clean room, remove all street clothing, store these items in clean sealable plastic bags or lockers and don coveralls, head covering, foot covering and gloves. All persons shall also don NIOSH approved respiratory protection. Clean respirators and protective clothing shall be utilized, by each person, for each separate entry into the work area. Respirators shall be inspected prior to each use and tested for proper seal using quantitative or qualitative fit checks.
5. Persons wearing designated personal protective equipment shall proceed from the clean room through the shower room to the equipment room, where necessary tools are collected and any additional clothing shall be donned, before entry into the work area.
6. Before leaving the work area, all persons shall remove gross contamination from the outside of respirators and protective clothing by brushing, wet cleaning, and/or HEPA vacuuming.
7. Persons shall proceed to the equipment room where all coveralls, head covering, foot covering and gloves shall be removed. Disposable clothing shall be deposited into labeled containers for disposal. Reusable contaminated clothing, footwear, head gear and gloves shall be stored in the equipment room when not being used in the work area.
8. Still wearing respirators, persons shall proceed to the shower area, clean the outside of the respirator and the exposed face area under running water prior to removal of the respirator, and then fully and vigorously shower and shampoo to remove residual asbestos contamination. Respirators shall be washed thoroughly with soap and water. Some types of respirators will require slight modification of these procedures. An airline respirator with HEPA filtered disconnect protection shall be disconnected in the equipment room and worn into the shower. A powered air-purifying respirator facepiece shall be disconnected from the filter/power pack assembly prior to entering the shower.
9. After showering and drying, all persons shall proceed to the clean room and don clean personal protective equipment if returning to the work area or street clothing if exiting the enclosure.

### **3.05 EQUIPMENT AND WASTE CONTAINER DECONTAMINATION & REMOVAL PROCEDURES**

- A. The following procedures shall be followed throughout the asbestos abatement project until satisfactory clearance air monitoring results have been achieved.
  1. External surfaces of contaminated containers and equipment shall be cleaned by wet cleaning and/or HEPA vacuuming in the work area before moving such items into the waste decontamination enclosure system airlock by persons assigned to this duty. These work area persons shall not enter the airlock.
  2. These contaminated items shall be removed from the airlock by persons stationed in the washroom during waste removal operations. These washroom persons shall remove gross contamination from the exterior of their respirators and protective clothing by brushing, HEPA vacuuming and/or wet cleaning.
  3. Once in the waste decontamination enclosure system, external surfaces of contaminated containers and equipment shall be cleaned a second time by wet cleaning.
  4. The cleaned containers of asbestos material and equipment are to be dried of any excessive pooled or beaded liquid, placed in uncontaminated plastic bags or sheeting and sealed airtight.



5. The clean recontainerized items shall be moved into the airlock that leads to the holding area. The washroom persons shall not enter this airlock or the work area until waste removal is finished for that period.
6. Containers and equipment shall be moved from the airlock and into the holding area by persons dressed in clean personal protective equipment, who have entered from uncontaminated areas.
7. The cleaned containers of asbestos material and equipment shall be placed in water tight carts with doors or tops that shall be closed and secured. These carts shall be held in the holding area pending removal. The carts shall be wet cleaned and/or HEPA vacuumed at least once each day.
8. The exit from the decontamination enclosure system shall be secured to prevent unauthorized entry.
9. Where the waste removal enclosure is part of the personnel decontamination enclosure, waste removal shall not occur during shift changes or when otherwise occupied. Precautions shall be taken to prevent short circuiting and cycling of air outward through the shower and clean room.
10. Containers labeled with Asbestos hazard warnings shall not be used to dispose of non asbestos waste.

### **3.06 ENGINEERING CONTROLS**

#### **A. Ventilation.**

1. The Abatement Contractor shall employ HEPA equipped vacuums or negative air pressure equipment for ventilation as required.
2. All negative air pressure equipment ventilation units shall be equipped with HEPA filtration. The Contractor shall provide a manufacturer's test certificate for each unit documenting the capability of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns equivalent aerodynamic diameter.
3. A power supply shall be available to satisfy the requirements of the total of all ventilating units.
4. On electric power failure, abatement shall stop immediately and shall not resume until power is restored and exhaust units are operating fully. On extended power failure, longer than one hour, the decontamination facilities, after the evacuation of all persons from the work area, shall be sealed airtight.
5. If extending the exhaust of the ventilation units 50 feet from the building would result in an exhaust location either in the road, blocking driveway access to the facility or within 50 feet of other buildings, a second unit will be run in series with the primary unit.

### **3.07 MAINTENANCE OF DECONTAMINATION ENCLOSURE SYSTEMS AND WORK AREA BARRIERS**

#### **A. GENERAL REQUIREMENTS**

1. The Consultant must review and approve installation before commencement of work. Upon completion of the construction of all plastic barriers and decontamination system enclosures and prior to beginning actual abatement activities.



2. All plastic barriers inside the work area, in the personnel decontamination enclosure system, in the waste decontamination enclosure system and at partitions constructed to isolate the work area from occupied areas, shall be inspected by the asbestos supervisor at least twice daily. The barriers shall be inspected before the start of and following the completion of the day's abatement activities. Inspections and observations shall be documented in the project log.
3. Damage and defects in the barriers and/or enclosure systems shall be repaired immediately upon discovery and prior to resumption of abatement activities.
4. At any time during the abatement activities, if visible emissions are observed outside of the work area or if damage occurs to the barriers, work shall be stopped, repairs made and visible residue immediately cleaned up using HEPA vacuuming methods prior to the resumption of abatement activities.
5. The Abatement Contractor shall HEPA vacuum and/or wet clean the waste decontamination enclosure system and the personnel decontamination enclosure system at the end of each day of abatement activities.

### **3.08 HANDLING AND REMOVAL PROCEDURES**

The Abatement Contractor may utilize existing provisions of ICR-56, Applicable Variances or a Site-Specific Variance, approved by the Owner's Consultant, to permit the conduct of this work.

### **3.09 ABATEMENT PROCEDURES**

#### **A. AIR SAMPLING - By Owner**

1. Air sampling and analysis shall be conducted according to the requirements of Subpart 56-4 before the start, during and after the completion of the asbestos removal project.
2. In addition to the requirements of Subpart 56-4, air monitoring shall be conducted in accordance with any approved job specific variance(s) or applicable variance utilized.
3. Clearance samples may be analyzed using PCM to maintain compliance with ICR-56.
4. If applicable, clearance samples will be analyzed using TEM to maintain compliance with ICR-56 and 40 CFR 763.90[j].

B. The provisions of the Applicable Variances or a Job Specific Variance shall apply only in those areas where approval has been granted by the NYS DOL and the Contractor has obtained concurrence from the Owner's Consultant. All other applicable provisions of Industrial Code Rule 56-1 through 56-12 shall be complied.

C. A copy of the NYS DOL Job Specific or Applicable Variance, if applicable, shall be conspicuously posted at the work area(s).

D. The Abatement Contractor shall construct a decontamination unit at the work site. The Abatement Contractor shall, as a minimum, comply with the requirements of 29 CFR 1926.1101(j); Hygiene facilities and practices for employees.



### **3.10 ENCAPSULATION PROCEDURES**

The following procedures shall be followed to seal in non-visible residue, after obtaining satisfactory clearance air monitoring results, while conducting lockdown encapsulation on any surfaces which were the subject of removal or other remediation activities:

- A. Only encapsulants rated as acceptable or marginally acceptable on the basis of Battelle Columbus Laboratory test procedures and rating requirements developed under the 1978 USEPA contract shall be used for lockdown encapsulation.
- B. Sealants considered for use in encapsulation shall first be tested to ensure that the sealant is adequate for its intended use. A section of the work surface shall be evaluated following this initial test application of the sealant to quantitatively determine the sealant's effectiveness in terms of penetrating and locking down the asbestos fibers. The American Society of Testing and Materials (ASTM) Committee E06.21.06E on Encapsulation of Building Materials has developed a guidance document to assist in the selection of an encapsulant.
- C. The encapsulant solvent or vehicle shall not contain a volatile hydrocarbon.
- D. Encapsulants shall be applied using airless spray equipment.
  - 1. Spraying is to occur at the lowest pressure range possible to minimize fiber release from encapsulant impact at the surface. It shall be applied with a consistent horizontal or vertical motion.
- E. Encapsulation shall be utilized as a surface sealant once all asbestos containing materials have been removed in a work area. In no event shall encapsulant be applied to any surface that was the subject of removal or other remediation activities prior to obtaining satisfactory clearance air monitoring.

### **3.11 CLEANUP PROCEDURES**

- A. The following cleanup procedures shall be required.
  - 1. Cleanup of accumulations of loose asbestos material shall be performed whenever enough loose asbestos materials have been removed to fill a single leak tight container of the type commensurate with the material properties. In no case shall cleanup be performed less than once prior to the close of each working day. Asbestos material shall be kept wet until cleaned up.
  - 2. Accumulations of dust shall be cleaned off all surfaces on a daily basis using HEPA vacuum cleaning methods.
  - 3. Decontamination enclosures shall be HEPA vacuumed at the end of each shift.
  - 4. Accumulations of asbestos waste material shall be containerized utilizing HEPA vacuums or rubber or plastic dust pans, squeegees or shovels. Metal shovels shall not be used to pick up or move waste.
  - 5. Excessive water accumulation or flooding in the area shall require work to stop until the water is collected and disposed of properly.
- B. The following cleanup procedures shall be required after completion of all removal activities.



1. All accumulations of asbestos waste material shall be containerized utilizing HEPA vacuums or rubber or plastic dust pan, squeegees or shovels. Metal shovels shall not be used to pick up or move waste. HEPA vacuums shall be used to clean all surfaces after gross cleanup.
2. Cleaning. All surfaces in the work area shall be HEPA vacuumed. To pick up excess liquid and wet debris, a wet purpose shop vacuum may be used and shall be decontaminated prior to removal from the work area.
3. Windows, doors, HVAC system vents and all other openings shall remain sealed. Decontamination enclosure systems shall remain in place and be utilized.
4. All containerized waste shall be removed from the work area and the holding area.
5. All tools and equipment shall be decontaminated and removed from the work area.
6. A final visual inspection and clearance air monitoring, as per the schedule for air sampling and analysis, shall be conducted.
7. The isolation barriers and decontamination unit shall be removed only after satisfactory clearance air monitoring results have been achieved.

### **3.12 SAFETY MONITORING – CONSULTANT:**

The Consultant will designate an Asbestos Safety Technician (AST) to represent the Owner during the removal program. The AST must be on the job site at all times during abatement work. Absolutely no abatement or preparation work will occur without the presence of the AST.

The AST will conduct four (4) milestone inspections.

1. Pre-commencement inspection shall be conducted as follows:
  - a. Notification in writing to the Consultant shall be made by the Abatement Contractor to request a pre-commencement inspection at least 48 hours in advance of the desired date of inspection. This inspection shall be requested prior to beginning preparatory work in another work area.
  - b. The AST shall ensure that:
    - i. The job site is properly prepared and that all containment measures are in place;
    - ii. The designated supervisor shall present to the inspector a valid supervisor's license issued by the New York Department of Labor;
    - iii. All workers shall present to the inspector a valid handler's license issued by the New York Department of Labor;
    - iv. Measures for the disposal of removed asbestos material are in place and shall conform to the adopted standards;
    - v. The Abatement Contractor has a list of emergency telephone numbers at the job site which shall include the monitoring firm employed by the Owner and telephone numbers for fire, police, emergency squad, local hospital and health officer.



- c. If all is in order, the AST shall issue a written notice to proceed in the field. If the job site is not in order, then any needed corrective action must be taken before any work is to commence. Conditional approvals shall not be granted.

Progress inspection shall be conducted as follows:

- a. Primary responsibility for ensuring that the abatement work progresses in accordance with these technical specifications and regulatory requirements rests with the Abatement Contractor. The AST shall continuously be present to observe the progress of work and perform required tests.
- b. If the AST observes irregularities at any time, he shall direct such corrective action as may be necessary. If the Abatement Contractor fails to take the corrective action required, or if the Abatement Contractor or any of their employees habitually and/or excessively violate the requirements of any regulation, then the AST shall inform the Owner who shall issue a Stop Work Order to the Abatement Contractor and have the work site secured until all violations are abated.

Clean-up inspections shall be conducted as follows:

- a. Notice for clean-up inspection shall be requested by the Abatement Contractor at least 24 hours in advance of the desired date of inspection;
  - b. The clean-up inspection shall be conducted prior to the removal of any isolation or critical barriers and before final air clearance monitoring;
  - c. The AST shall ensure that:
    - i. The work site has been properly cleaned and is free of visible asbestos containing material and debris.
    - ii. All removed asbestos has been properly placed in a locked secure container outside of the work area.
  - d. If all is in order, the AST shall issue a written notice of authorization to remove surface barriers from the work area. All isolation barriers shall remain in place until satisfactory clearance air sampling has been completed.
4. Clearance Visual Inspection shall be conducted after the removal of non-critical plastic sheeting. The AST shall insure that:
- a. The work area is free of all visible asbestos or suspect asbestos debris and residue.
  - b. All waste has been properly bagged and removed from the work area.
  - c. Should clearance visual inspection identify residual debris, as determined by the AST, the Abatement Contractor is responsible for recleaning the area at his own cost and shall bear all costs of reinspection until acceptable levels are achieved.
- B. The Abatement Contractor shall be required to receive written approval before proceeding after each milestone inspection.



### **3.13 PERSONNEL AIR MONITORING – CONTRACTOR (29 CFR 1926.1101)**

- A. Personnel air monitoring shall be provided to determine both short-term (STEL) and full shift during when abatement activities occur. Personnel sampling shall be performed in each work area in order to accurately determine the concentrations of airborne asbestos to which workers may be exposed.
- B. The Abatement Contractor shall have a qualified "Competent Person" (as specified in 29 CFR 1926 OSHA) to conduct personnel air monitoring.
- C. The laboratory performing the air sample analysis shall be certified by NYS DOH ELAP and approved by the consultant.
- D. Personnel air monitoring test results for OSHA Compliance. Results shall be posted at the work site within 24 hours of testing and copies supplied to the Owner within five (5) days of testing. Abnormalities shall be supplied to the Owner immediately.

### **3.14 CLEARANCE AIR MONITORING**

- A. Air samples will be collected in and around the work areas at the completion of abatement activities.
- B. Clearance samples may be analyzed using PCM to maintain compliance with ICR-56.
- C. If applicable, clearance samples will be analyzed using TEM to maintain compliance with ICR-56 and 40 CFR part 763 "Asbestos-Containing Materials in Schools; Final Rule and Notice" section 763.90.
- D. \*\*\*RETESTING\*\*\*  
Should clearance air monitoring yield fiber concentrations above the "Clearance" criteria of either 0.01 fibers per CC and/or background levels (PCM) –OR- seventy (70) structures per square millimeter (TEM/AHERA), the Abatement Contractor is responsible for re-cleaning the area at his own cost and shall bear all costs associated with the retesting of the work area(s) including monitoring labor, sampling, analysis, etc. until such levels are achieved.

### **3.15 RESPIRATORY PROTECTION REQUIREMENT**

- A. Respiratory protection shall be worn by all individuals inside the work area from the initiation of the asbestos project until all areas have successfully passed clearance air monitoring in accordance with these specifications. The Abatement Contractor shall keep available at all times two PAPR's with new filters and charged batteries for use by authorized visitors.
- B. All respiratory protection shall be MSHA/NIOSH approved in accordance with the provisions of 30 CFR Part II. All respiratory protection shall be provided by the Abatement Contractor and used by workers in conjunction with the written respiratory protection program.
- C. The Abatement Contractor shall provide respirators that meet the requirements of 29 CFR Parts 1910 and 1926.
  - 1. Full facepiece Type C supplied-air respirators operated in pressure demand mode equipped with an auxiliary self- contained breathing apparatus, operated in pressure demand or continuous flow, shall be worn during gross removal, demolition, renovation and/or other disturbance of ACM whenever airborne fiber concentrations inside the work area are greater than 10.0 f/cc.



2. Full facepiece Type C supplied-air respirators operated in pressure demand mode with HEPA filter disconnect protection shall be work during gross removal, demolition, renovation and/or other disturbance of ACM with an amphibole content and/or whenever airborne fiber concentrations inside the work area are equal to or greater than 0.5 f/cc and less than or equal to 10.0 f/cc.
  3. Full facepiece powered air-purifying respirators (PAPR) equipped with HEPA filters shall be worn during the removal, encapsulation, enclosure, repair and/or other disturbance of friable ACM if airborne fiber concentrations inside the work area are less than 0.5 f/cc. A supply of charged replacement batteries, HEPA filters and flow test meter shall be available in the clean room for use with powered air-purifying respirators. HEPA filters shall be changed daily or as flow testing indicates change is necessary. Any Type C supplied-air respirator operated in continuous flow, with HEPA filter disconnect protection, may be substituted for a powered air-purifying respirator.
  4. Loose fitting helmets or hoods with powered air-purifying respirators (PAPR) equipped with HEPA filters may be worn during the removal, encapsulation, enclosure, repair and/or other disturbance of friable ACM if airborne fiber concentrations inside the work area are less than 0.25 f/cc. A supply of charged replacement batteries, HEPA filters and flow test meter shall be available in the clean room for use with powered air-purifying respirators. HEPA filters shall be changed daily or as flow testing indicates change is necessary. Any Type C supplied-air respirator operated in continuous flow may be substituted for a powered air-purifying respirator.
  5. Half-mask or full-face air-purifying respirators with HEPA filters shall be worn only during the preparation of the work area and final clean up procedures provided airborne fiber concentrations inside the work area are less than 0.1 f/cc.
  6. Use of single use dust respirators is prohibited for the above respiratory protection.
- D. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.
- E. The Abatement Contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every six months thereafter with the type of respirator he/she will be using.
- F. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.
- G. No facial hair, which interferes with the face-to-mask sealing surface, shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.
- H. Contact lenses shall not be worn in conjunction with respiratory protection.
- I. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the Abatement Contractor at the Abatement Contractor's expense.
- J. Respiratory protection maintenance and decontamination procedures shall meet the following requirement:
1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134(b); and



2. HEPA filters for negative pressure respirators shall be changed after each shower; and
  3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures; and
  4. Airline respirators with HEPA filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator facepieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers' recommendations; and
  5. Respirators shall be stored in a dry place and in such a manner that the facepiece and exhalation valves are not distorted; and
  6. Organic solvents shall not be used for washing of respirators.
- K. No visitors shall be allowed to enter the contaminated area if they do not have their medical certification and training certificate. Authorized visitors shall be provided with suitable PAPR respirators and instructions on the proper use of respirators whenever entering the work area.

### **3.16 DISPOSAL OF WASTE**

#### **A. APPLICABLE REGULATIONS**

1. All asbestos waste shall be stored, transported and disposed of as per, but not limited to, the following Regulations:
  - a. NYS Code Rule 56
  - b. U.S. Department of Transportation (DOT)  
Hazardous Substances  
Title 29, Part 171 and 172 of the code of Federal Regulations  
regarding waste collector registration
  - c. Regulations regarding waste collector registration Title 6, part 364 of the New York State Official Compilation of Codes, Rules and Regulations – 6 NYCRR 364
  - d. USEPA NESHAPS 40 CFR 61
  - e. USEPA ASBESTOS WASTE MANAGEMENT GUIDANCE EPA/530-SW-85-007

#### **B. TRANSPORTER OR HAULER - The Abatement Contractor shall bear full responsibility for proper characterization, transportation and disposal of all solid or liquid waste, generated during the project, in a legal manner. The Owner shall approve all transportation and disposal methods.**

1. The Abatement Contractor's Transporter (hauler) and disposal site shall be approved by the Owner. The Abatement Contractor shall remove within 48 hours all asbestos waste from the site after completing the clean up.
2. The Transporter must possess and present to the Owner's representative a valid New York State Department of Environmental Conservation Part 364 asbestos hauler's permit to verify license plate and permit numbers. The Owner's representative will verify the authenticity of the hauler's permit with the proper authority.



3. The Abatement Contractor shall give 24 hour notification prior to removing any waste from the site. All waste shall be removed from site only during normal working hours. No waste may be taken from the site without authorization from the Owner's representative.
4. The Abatement Contractor shall have the Transporter give the date and time of arrival at the disposal site.
5. The Transporter with the Abatement Contractor and Owner's consultant shall inspect all material in the transport container prior to taking possession and signing the Waste Manifest. The Transporter shall not have any off site transfers or be combined with any other off-site asbestos material.
6. The Transporter must travel directly to the disposal site with no unauthorized stops.

C. WASTE STORAGE CONTAINER

1. During loading and on site storage, the asbestos waste container shall be labeled with EPA Danger signage:

**DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD**

2. The NYS DEC Hauler's Permit number shall be on both sides and back of the container.
3. The Container will not be permitted to leave the site without the proper signage.
4. A copy of the completed waste manifest shall be forwarded directly to the Owner's Consultant by the disposal facility.
5. Packaging of Non-friable Asbestos. Use of an open top container shall require written request, by the Contractor, and written approval by the Owners Representative, and be performed in compliance with all applicable regulations.
  - a) A chute, if used, shall be air/dust tight along its lateral perimeter and at the terminal connection to the dumpster at ground level (solid wall and top container). The upper end of the chute shall be furnished with a hinged lid, to be closed when the chute is not being used.
  - b) The container shall be lined with a minimum of two (2) layers of 6 mil. Fire-retardant polyethylene draped loosely over the sides so as to facilitate being wrapped over the top of the load and sealed prior to transport from the site.
  - c) Prior to transport from the work site the Dumpster will be disconnected from the chute and sealed air/dust tight utilizing six mil plastic and tape. The waste material will be transported as an asbestos containing material by appropriate legal methods.
6. Packaging Friable Asbestos.
  - a) The container shall be a solid wall, hard top and lockable container.



- b) The container shall be locked upon arrival at the site to restrict access. Security shall be provided at the entrance to the container during the loading process and immediately locked upon completion.
- c) The interior walls, floor and ceiling shall be lined with two (2) layers of 6 mil. Fire-retardant polyethylene.
- d) The waste shall be loaded in such a manner as to protect the integrity of the individual waste packages.
- e) Prior to transport from the work site the interior of the Dumpster will be sealed air/dust tight utilizing six mil plastic and tape. The waste material will be transported as an asbestos containing material by appropriate legal methods.

#### D. WASTE DISPOSAL MANIFEST

- 1. The Asbestos Waste Manifest shall be equivalent to the "Waste Shipment Record" included in 40 CFR 61. A copy of the Contractor's manifest shall be reviewed by the Owner's Consultant and shall be the only manifest used.
- 2. The Manifest shall be verified by the Owner's Consultant indicating that all the information and amounts are accurate and the proper signatures are in place.
- 3. The Manifest shall have the signatures of the Abatement Contractor and the Transporter prior to any waste being removed from the site.
- 4. The Manifest shall be signed by the Disposal Facility owner or operator to certify receipt of asbestos containing materials covered by the manifest.
- 5. A copy of the completed manifest shall be provided by the Abatement Contractor to the Owner's Consultant and remain on site for inspection.
- 6. Abatement Contractor shall maintain a waste disposal log which indicates load number, date and time left site, container size, type of waste, quantity of waste, name of hauler, NYS DES permit number, trailer and tractor license number, and date manifest was returned to Consultant.
- 7. The Disposal Facility owner or operator shall return a signed copy of the Waste Manifest directly to:

**Poughkeepsie CSD  
18 South Perry Street  
Poughkeepsie, New York 12601  
ATTN: Marcos Rodriguez**

- 8. Copies of the completed Waste Manifest are to be sent by the disposal facility to the Hauler and Abatement Contractor.
- 9. Submit signed dump tickets and manifests with final payment request.
- 10. Final payment request will not be honored without signed dump ticket or manifests accounting for all asbestos waste removed from the site.



E. VIOLATIONS OF SPECIFICATIONS

1. Violations of the safety, hygiene, environmental, procedures herein, any applicable federal, state or local requirements or failure to cooperate with the Owner's representative shall be grounds for dismissal and/or termination of this contract.

F. VIOLATIONS OF NO SMOKING POLICY

1. The Federal Pro Children Act of 1994 prohibits School District Officials from smoking in any buildings or on the grounds that is property of the School District. The District shall be considered smoke free. The School District strongly enforces its' No Smoking Policy. It is the Contractor's responsibility to inform all workers of this policy. Any worker(s) involved with this project that are found smoking or using tobacco products will be informed that they are in violation of the Federal and State Law and School Board Policy and will be removed from site.



### 3.17 LOCATION OF "ABATEMENT WORK"

*(Please see attached Drawings for approximate locations)*

#### 1) CLINTON ELEMENTARY SCHOOL (INTERIOR ABATEMENT)

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms and responsible for total and complete removal and disposal of approximately 380 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 007 (50 LF)
  - Lower-Level Girls Bathroom 016 (50 LF)
  - First Floor Boys Bathroom 104 (50 LF)
  - First Floor Girls Bathroom 120 (50 LF)
  - First Floor Toilet Room 105 (20 LF)
  - First Floor Toilet Room 111A (20 LF)
  - First Floor Toilet Room 114A (20 LF)
  - First Floor Toilet Room 115A (20 LF)
  - Second Floor Boys Bathroom 204 (50 LF)
  - Second Floor Girls Bathroom 211 (50 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 140 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 007 (20 SF)
  - Lower-Level Girls Bathroom 016 (20 SF)
  - First Floor Boys Bathroom 104 (20 SF)
  - First Floor Girls Bathroom 120 (20 SF)
  - First Floor Toilet Room 105 (5 SF)
  - First Floor Toilet Room 111A (5 SF)
  - First Floor Toilet Room 114A (5 SF)
  - First Floor Toilet Room 115A (5 SF)
  - Second Floor Boys Bathroom 204 (20 SF)
  - Second Floor Girls Bathroom 211 (20 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 96 SF of friable presumed asbestos-containing Fire Door Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Storage Room 011 (32 SF)
  - Second Floor Corridor 200 Outside Boys Bathroom 204 (64 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 200 SF of friable presumed asbestos-containing Boiler Interiors, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boiler Room Boiler B-2 (200 SF)



***Location of Abatement Work Cont'd...***

**2) COLUMBUS ELEMENTARY SCHOOL (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms and responsible for total and complete removal and disposal of approximately 340 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 019 (50 LF)
  - Lower-Level Girls Bathroom 010 (50 LF)
  - First Floor Boys Bathroom 119 (50 LF)
  - First Floor Girls Bathroom 110 (50 LF)
  - First Floor Toilet Room 113A (20 LF)
  - First Floor Toilet Room 118A (20 LF)
  - Second Floor Boys Bathroom 219 (50 LF)
  - Second Floor Girls Bathroom 210 (50 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 130 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 019 (20 SF)
  - Lower-Level Girls Bathroom 010 (20 SF)
  - First Floor Boys Bathroom 119 (20 SF)
  - First Floor Girls Bathroom 110 (20 SF)
  - First Floor Toilet Room 113A (5 SF)
  - First Floor Toilet Room 118A (5 SF)
  - Second Floor Boys Bathroom 219 (20 SF)
  - Second Floor Girls Bathroom 210 (20 SF)

**3) KRIEGER ELEMENTARY SCHOOL (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for complete removal and disposal of approximately 2,950 SF of friable asbestos-containing wall/ceiling plaster and/or complete removal and disposal of approximately 280 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation above bathroom ceilings and/or wet walls, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - First Floor Girls Bathroom 106 (625 SF & 50 LF)
  - First Floor Boys Bathroom 137 (625 SF & 50 LF)
  - First Floor Toilet Room 112 (275 SF & 20 LF)
  - First Floor Toilet Room 120A (175 SF & 20 LF)
  - First Floor Toilet Room 142 (20 LF)
  - Second Floor Girls Bathroom 204 (625 SF & 50 LF)
  - Second Floor Boys Bathroom 219 (625 SF & 50 LF)
  - Second Floor Toilet Room 224 (20 LF)



***Location of Abatement Work Cont'd...***

- Abatement Contractor responsible for complete removal and disposal of approximately 100 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - First Floor Girls Bathroom 106 (20 SF)
  - First Floor Boys Bathroom 137 (20 SF)
  - First Floor Toilet Room 112 (5 SF)
  - First Floor Toilet Room 120A (5 SF)
  - First Floor Toilet Room 142 (5 SF)
  - Second Floor Girls Bathroom 204 (20 SF)
  - Second Floor Boys Bathroom 219 (20 SF)
  - Second Floor Toilet Room 224 (5 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 200 SF of friable presumed asbestos-containing Boiler Interiors, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Basement Boiler Room Boiler B-2 (200 SF)

**4) MORSE ELEMENTARY SCHOOL (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms and responsible for total and complete removal and disposal of approximately 340 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Toilet Room B-6a (20 LF)
  - Lower-Level Toilet Room B-2a (20 LF)
  - First Floor Girls Bathroom F-3a (50 LF)
  - First Floor Boys Bathroom F-16a (50 LF)
  - First Floor Toilet Room F-5b (20 LF)
  - First Floor Toilet Room F-14c (20 LF)
  - First Floor Toilet Room F-15a (20 LF)
  - Second Floor Girls Bathroom S-17a (50 LF)
  - Second Floor Boys Bathroom S-21a (50 LF)
  - Second Floor Toilet Room S-14b (20 LF)
  - Second Floor Toilet Room S-18b (20 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 115 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Toilet Room B-6a (5 SF)
  - Lower-Level Toilet Room B-2a (5 SF)
  - First Floor Girls Bathroom F-3a (20 SF)
  - First Floor Boys Bathroom F-16a (20 SF)
  - First Floor Toilet Room F-5b (5 SF)
  - First Floor Toilet Room F-14c (5 SF)
  - First Floor Toilet Room F-15a (5 SF)



***Location of Abatement Work Cont'd...***

- Second Floor Girls Bathroom S-17a (20 SF)
- Second Floor Boys Bathroom S-21a (20 SF)
- Second Floor Toilet Room S-14b (5 SF)
- Second Floor Toilet Room S-18b (5 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 200 SF of friable presumed asbestos-containing Boiler Interiors, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boiler Room Boiler B-2 (200 SF)

**5) SMITH EARLY LEARNING CENTER (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms and responsible for total and complete removal and disposal of approximately 440 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 006 (50 LF)
  - Lower-Level Girls Bathroom 007 (50 LF)
  - Lower-Level Girls Bathroom 032 (20 LF)
  - Lower-Level Boys Bathroom 033 (20 LF)
  - First Floor Girls Bathroom 118 (50 LF)
  - First Floor Boys Bathroom 119 (50 LF)
  - First Floor Toilet Room 102 (20 LF)
  - First Floor Toilet Room 104 (20 LF)
  - First Floor Toilet Room 106 (20 LF)
  - First Floor Toilet Room 111 (20 LF)
  - Second Floor Girls Bathroom 214 (50 LF)
  - Second Floor Boys Bathroom 215 (50 LF)
  - Second Floor Toilet Room 209 (20 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 155 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 006 (20 SF)
  - Lower-Level Girls Bathroom 007 (20 SF)
  - Lower-Level Girls Bathroom 032 (5 SF)
  - Lower-Level Boys Bathroom 033 (5 SF)
  - First Floor Girls Bathroom 118 (20 SF)
  - First Floor Boys Bathroom 119 (20 SF)
  - First Floor Toilet Room 102 (5 SF)
  - First Floor Toilet Room 104 (5 SF)
  - First Floor Toilet Room 106 (5 SF)
  - First Floor Toilet Room 111 (5 SF)
  - Second Floor Girls Bathroom 214 (20 SF)
  - Second Floor Boys Bathroom 215 (20 SF)
  - Second Floor Toilet Room 209 (5 SF)



***Location of Abatement Work Cont'd...***

- Abatement Contractor responsible for complete removal and disposal of approximately 200 SF of non-friable asbestos-containing Ceramic Wall Base Adhesive, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 006 (30 SF)
  - Lower-Level Girls Bathroom 007 (30 SF)
  - First Floor Girls Bathroom 118 (30 SF)
  - First Floor Boys Bathroom 119 (30 SF)
  - First Floor Toilet Room 102 (10 SF)
  - First Floor Toilet Room 104 (10 SF)
  - Second Floor Girls Bathroom 214 (30 SF)
  - Second Floor Boys Bathroom 215 (30 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 200 SF of friable presumed asbestos-containing Boiler Interiors, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boiler Room Boiler B-2 (200 SF)

**6) WARRING ELEMENTARY SCHOOL (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms and responsible for total and complete removal and disposal of approximately 320 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 022 (20 LF)
  - Lower-Level Girls Bathroom 028 (20 LF)
  - Lower-Level Toilet Room 019 (20 LF)
  - First Floor Girls Bathroom 123 (50 LF)
  - First Floor Boys Bathroom 124 (50 LF)
  - First Floor Toilet Room 103 (20 LF)
  - First Floor Toilet Room 109 (20 LF)
  - Second Floor Girls Bathroom 221 (50 LF)
  - Second Floor Boys Bathroom 222 (50 LF)
  - Second Floor Toilet Room 208 (20 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 155 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boys Bathroom 022 (5 SF)
  - Lower-Level Girls Bathroom 028 (5 SF)
  - Lower-Level Toilet Room 019 (5 SF)
  - First Floor Girls Bathroom 123 (20 SF)
  - First Floor Boys Bathroom 124 (20 SF)
  - First Floor Toilet Room 103 (5 SF)
  - First Floor Toilet Room 109 (5 SF)
  - Second Floor Girls Bathroom 221 (20 SF)



***Location of Abatement Work Cont'd...***

- Second Floor Boys Bathroom 222 (20 SF)
- Second Floor Toilet Room 208 (5 SF)
- Abatement Contractor responsible for complete removal and disposal of approximately 20 SF of non-friable asbestos-containing Ceramic Wall Base Adhesive, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Toilet Room 019 (10 SF)
  - Lower-Level Girls Bathroom 028 (10 SF)
- Abatement Contractor responsible for complete removal and disposal of approximately 25 SF of non-friable asbestos-containing Floor Tiles, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - First Floor Toilet Room 109 Vestibule (25 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 200 SF of friable presumed asbestos-containing Boiler Interiors, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Boiler Room Boiler B-2 (200 SF)

**7) WARRING ELEMENTARY SCHOOL (EXTERIOR ABATEMENTS)**

- Abatement Contractor responsible for total and complete removal and disposal of approximately 5,100 SF of non-friable asbestos-containing Roof Tar on Metal Deck, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for removal of the entire roofing systems and disposal as ACM. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). Temporary security and environmental protection throughout remaining opening shall be coordinated with and provided by the Roofing Contractor.
- Abatement Contractor responsible for total and complete removal and disposal of approximately 1,800 SF of non-friable asbestos-containing Cementitious Window Panels, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for removal of entire window systems and disposal as ACM. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). Temporary security and environmental protection throughout remaining opening shall be coordinated with and provided by the Window Contractor.

**8) POUGHKEEPSIE MIDDLE SCHOOL (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms and responsible for total and complete removal and disposal of approximately 1,140 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - Lower-Level Girls Bathroom B59 (50 LF)
  - Lower-Level Boys Bathroom B61 (50 LF)
  - Lower-Level Girls Bathroom B65 (20 LF)



***Location of Abatement Work Cont'd...***

- Lower-Level Boys Bathroom B66 (20 LF)
  - Lower-Level Toilet Room B12 (20 LF)
  - Lower-Level Toilet Room B17 (20 LF)
  - Lower-Level Toilet Room B18 (20 LF)
  - Lower-Level Toilet Room B25 (20 LF)
  - Lower-Level Toilet Room B36 (20 LF)
  - Lower-Level Mens Bathroom B68 (20 LF)
  - Lower-Level Womens Bathroom B69 (20 LF)
  - First Floor Boys Bathroom 108A (20 LF)
  - First Floor Girls Bathroom 108B (20 LF)
  - First Floor Girls Bathroom 127 (50 LF)
  - First Floor Boys Bathroom 128 (50 LF)
  - First Floor Boys Bathroom 165 (50 LF)
  - First Floor Girls Bathroom 166 (50 LF)
  - First Floor Mens Bathroom 135 (30 LF)
  - First Floor Womens Bathroom 136 (30 LF)
  - First Floor Toilet Room 140 (20 LF)
  - First Floor Toilet Room 141 (20 LF)
  - First Floor Toilet Room 142 (20 LF)
  - First Floor Toilet Room 115A (20 LF)
  - Second Floor Girls Bathroom 214 (50 LF)
  - Second Floor Boys Bathroom 215 (50 LF)
  - Second Floor Boys Bathroom 246 (50 LF)
  - Second Floor Girls Bathroom 247 (50 LF)
  - Second Floor Toilet Room 221 (20 LF)
  - Second Floor Toilet Room 222 (20 LF)
  - Third Floor Girls Bathroom 315 (50 LF)
  - Third Floor Boys Bathroom 316 (50 LF)
  - Third Floor Boys Bathroom 343 (50 LF)
  - Third Floor Girls Bathroom 344 (50 LF)
  - Third Floor Toilet Room 322 (20 LF)
  - Third Floor Toilet Room 323 (20 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 405 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
- Lower-Level Girls Bathroom B59 (20 SF)
  - Lower-Level Boys Bathroom B61 (20 SF)
  - Lower-Level Girls Bathroom B65 (5 SF)
  - Lower-Level Boys Bathroom B66 (5 SF)
  - Lower-Level Toilet Room B12 (5 SF)
  - Lower-Level Toilet Room B17 (5 SF)
  - Lower-Level Toilet Room B18 (5 SF)
  - Lower-Level Toilet Room B25 (5 SF)
  - Lower-Level Toilet Room B36 (5 SF)
  - Lower-Level Mens Bathroom B68 (5 SF)
  - Lower-Level Womens Bathroom B69 (5 SF)
  - First Floor Boys Bathroom 108A (5 SF)
  - First Floor Girls Bathroom 108B (5 SF)
  - First Floor Girls Bathroom 127 (20 SF)



***Location of Abatement Work Cont'd...***

- First Floor Boys Bathroom 128 (20 SF)
  - First Floor Boys Bathroom 165 (20 SF)
  - First Floor Girls Bathroom 166 (20 SF)
  - First Floor Mens Bathroom 135 (15 SF)
  - First Floor Womens Bathroom 136 (15 SF)
  - First Floor Toilet Room 140 (5 SF)
  - First Floor Toilet Room 141 (5 SF)
  - First Floor Toilet Room 142 (5 SF)
  - First Floor Toilet Room 115A (5 SF)
  - Second Floor Girls Bathroom 214 (20 SF)
  - Second Floor Boys Bathroom 215 (20 SF)
  - Second Floor Boys Bathroom 246 (20 SF)
  - Second Floor Girls Bathroom 247 (20 SF)
  - Second Floor Toilet Room 221 (5 SF)
  - Second Floor Toilet Room 222 (5 SF)
  - Third Floor Girls Bathroom 315 (20 SF)
  - Third Floor Boys Bathroom 316 (20 SF)
  - Third Floor Boys Bathroom 343 (20 SF)
  - Third Floor Girls Bathroom 344 (20 SF)
  - Third Floor Toilet Room 322 (5 SF)
  - Third Floor Toilet Room 323 (5 SF)
- Abatement Contractor responsible for total and complete removal and disposal of approximately 32 SF of friable presumed asbestos-containing Fire Door Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
    - Lower-Level Boiler Room B70 (32 SF)
  - Abatement Contractor responsible for total and complete removal and disposal of approximately 800 SF of friable presumed asbestos-containing Boiler Interiors, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
    - Lower-Level Boiler Room Boiler B-1 (400 SF)
    - Lower-Level Boiler Room Boiler B-2 (400 SF)

**9) POUGHKEEPSIE MIDDLE SCHOOL (EXTERIOR ABATEMENTS)**

- Abatement Contractor responsible for total and complete removal and disposal of approximately 300 SF of non-friable asbestos-containing Roof Equipment Flashing Tar on Wood, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for removal of the entire equipment flashing systems and disposal as ACM. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). Temporary security and environmental protection throughout remaining opening shall be coordinated with and provided by the Roofing Contractor.



***Location of Abatement Work Cont'd...***

- Abatement Contractor responsible for total and complete removal and disposal of approximately 240 SF of non-friable presumed asbestos-containing Roof Materials, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for removal of the entire roofing system and disposal as ACM. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). Temporary security and environmental protection throughout remaining opening shall be coordinated with and provided by the Roofing Contractor.

**10) POUGHKEEPSIE HIGH SCHOOL (INTERIOR ABATEMENT)**

- Abatement Contractor responsible for probing of ceilings and/or wet walls within identified bathrooms/locker rooms and responsible for total and complete removal and disposal of approximately 1,570 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - First Floor Girls Bathroom T-1 (50 LF)
  - First Floor Boys Bathroom T-2 (50 LF)
  - First Floor Girls Bathroom T-11 (50 LF)
  - First Floor Boys Bathroom T-12 (50 LF)
  - First Floor Girls Bathroom T-15 (50 LF)
  - First Floor Boys Bathroom T-16 (50 LF)
  - First Floor Toilet Room T-13 (20 LF)
  - First Floor Toilet Room T-14 (20 LF)
  - First Floor Toilet Room 119 (20 LF)
  - First Floor Toilet Room 120 (20 LF)
  - First Floor Toilet Room 121 (10 LF)
  - First Floor Toilet Room 126A (20 LF)
  - First Floor Toilet Room 126B (30 LF)
  - First Floor Toilet Room 126C (30 LF)
  - First Floor Toilet Room 142A (20 LF)
  - First Floor Toilet Room 144A (20 LF)
  - First Floor Toilet Room 146A (20 LF)
  - First Floor Girls Locker Room 143 (400 LF)
  - First Floor Boys Locker Room 149 (400 LF)
  - Second Floor Girls Bathroom T-17 (50 LF)
  - Second Floor Boys Bathroom T-18 (50 LF)
  - Second Floor Girls Bathroom T-21 (50 LF)
  - Second Floor Boys Bathroom T-22 (50 LF)
  - Second Floor Toilet Room T-19 (10 LF)
  - Second Floor Toilet Room T-20 (10 LF)
  - Second Floor Toilet Room T-X (20 LF)
- Abatement Contractor responsible for complete removal and disposal of approximately 390 SF of non-friable presumed asbestos-containing Mirror Glue Dabs, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
  - First Floor Girls Bathroom T-1 (20 SF)
  - First Floor Boys Bathroom T-2 (20 SF)
  - First Floor Girls Bathroom T-11 (20 SF)
  - First Floor Boys Bathroom T-12 (20 SF)



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***Location of Abatement Work Cont'd...***

- First Floor Girls Bathroom T-15 (20 SF)
  - First Floor Boys Bathroom T-16 (20 SF)
  - First Floor Toilet Room T-13 (5 SF)
  - First Floor Toilet Room T-14 (5 SF)
  - First Floor Toilet Room 119 (5 SF)
  - First Floor Toilet Room 120 (5 SF)
  - First Floor Toilet Room 121 (5 SF)
  - First Floor Toilet Room 126A (5 SF)
  - First Floor Toilet Room 126B (15 SF)
  - First Floor Toilet Room 126C (15 SF)
  - First Floor Toilet Room 142A (5 SF)
  - First Floor Toilet Room 144A (5 SF)
  - First Floor Toilet Room 146A (5 SF)
  - First Floor Girls Locker Room 143 (50 SF)
  - First Floor Boys Locker Room 149 (50 SF)
  - Second Floor Girls Bathroom T-17 (20 SF)
  - Second Floor Boys Bathroom T-18 (20 SF)
  - Second Floor Girls Bathroom T-21 (20 SF)
  - Second Floor Boys Bathroom T-22 (20 SF)
  - Second Floor Toilet Room T-19 (5 SF)
  - Second Floor Toilet Room T-20 (5 SF)
  - Second Floor Toilet Room T-X (5 SF)
- 
- Abatement Contractor responsible for complete removal and disposal of approximately 650 SF of Sheetrock Wall/Ceiling with friable asbestos-containing Joint Compound and removal and disposal of approximately 40 LF of friable presumed asbestos-containing Mudded Joint Packing (Elbows) and/or Pipe Insulation above bathroom ceilings and/or within wet walls, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
    - First Floor Toilet Room 122 (200 SF & 10 LF)
    - First Floor Toilet Room 123 (200 SF & 10 LF)
    - First Floor Toilet Room 124 (250 SF & 20 LF)
- 
- Abatement Contractor responsible for complete removal and disposal of approximately 1,000 SF of friable asbestos-containing Ductwork Insulation both exposed and concealed above plaster ceilings, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). See below for breakdown:
    - First Floor Girls Locker Room 143 (500 SF)
    - First Floor Boys Locker Room 149 (500 SF)
- 
- Abatement Contractor responsible for total and complete removal and disposal of approximately 160 SF of non-friable asbestos-containing Floor Tiles, Mastics and/or Floor Fillers, 24 SF of non-friable asbestos-containing Cove Base Molding and Adhesive, 552 SF of non-friable asbestos-containing Wallpaper Adhesive and/or 2,187 SF of non-friable asbestos-containing Floor Epoxy, as detailed on the attached ACM Location Drawing. Removals shall include all flooring/wall system layers to building substrate(s) beneath. After final air clearance, flooring substrates shall be washed with a neutralizing agent to prepare the substrate to accept new floor covering(s) and eliminate residual odors. The General Contractor responsible for re-installation of non-asbestos floor coverings/mastics. See below for breakdown:



***Location of Abatement Work Cont'd...***

- First Floor Toilet Room 122 (24 SF FT/Mastic & 176 SF WP/Adhesive)
- First Floor Toilet Room 123 (24 SF FT/Mastic & 176 SF WP/Adhesive)
- First Floor Toilet Room 124 (40 SF FT/Mastic & 200 SF WP/Adhesive)
- First Floor Toilet Room 119 (24 SF FT/Mastic & 8 SF CBM/Adhesive)
- First Floor Toilet Room 120 (24 SF FT/Mastic & 8 SF CBM/Adhesive)
- First Floor Toilet Room 121 (24 SF FT/Mastic & 8 SF CBM Adhesive)
- First Floor Boys Locker Room 149 (2,187 SF Floor Epoxy)

**11) POUGHKEEPSIE HIGH SCHOOL (EXTERIOR ABATEMENTS)**

- Abatement Contractor responsible for total and complete removal and disposal of approximately 150 LF of non-friable asbestos-containing Roof Termination Bar Caulk on Metal Flashing to Masonry Facade, as detailed on attached ACM Location Drawings. Abatement Contractor responsible for all demolition required to access material(s), as well as for providing all equipment necessary to access material(s). Temporary security and environmental protection throughout remaining opening shall be coordinated with and provided by the Roofing Contractor.

**END OF LOCATION OF WORK**



### **3.18 GENERAL**

- A. The Abatement Contractor will be responsible for repairing all building components damaged during abatement including, but not limited to: ceiling tiles, ceiling finishes, wall finishes, floor finishes, etc.
- B. The Abatement Contractor shall be responsible for all demolition required to access materials identified in scope of work and on associated drawings.
- C. Concealed conditions that are exposed and may require additional work shall be brought to the attention of the Owner immediately. The Abatement Contractor shall not abate these areas without a written notice to proceed. Additional asbestos abatement performed prior to the order to proceed will not be acknowledged.
- D. The Abatement Contractor shall remove asbestos-containing floor covering to the building substrate beneath; in areas indicted. Subsequent to final air clearance the substrate shall be washed with a neutralizing agent to prepare the substrate to accept new floor covering and eliminate residual odors.
- E. Power tools used to drill, cut into or otherwise disturb asbestos containing material shall be equipped with HEPA filtered local exhaust ventilation.
- F. The Abatement Contractor shall provide access to GFCI electrical power, required to perform the area air monitoring for this project, within and immediately adjacent to each work area.
- G. Unwrapped or unbagged ACM shall be immediately placed in an impermeable waste bag or wrapped in plastic sheeting.
- H. Coordinate all removal operations with the Owner.



**Asbestos Employee Medical Examination Statement  
Certificate of Worker Release  
Asbestos Employee Training Statement  
CERTIFICATE OF WORKERS'S ACKNOWLEDGEMENT**

**PROJECT NAME: Poughkeepsie CSD: 2020 Capital Improvement Project  
– Phase 1B Building Improvements**

**CONTRACTOR'S NAME:** \_\_\_\_\_

WORKING WITH ASBESTOS INVOLVES POTENTIAL EXPOSURE TO AIRBORNE ASBESTOS FIBERS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER AND RESPIRATORY DISEASES. SMOKING CIGARETTES AND INHALATION OF ASBESTOS FIBERS INCREASES THE RISK THAT YOU WILL DEVELOP LUNG CANCER ABOVE THAT OF THE NON-SMOKING PUBLIC.

The Contract for this project requires your employer to 1) supply proper respiratory protection devices and training on their use 2) provide training on safe work practices and on use of the equipment used on the project 3) provide a medical examination meeting the requirements of 29 CFR 1926.1101. Your signature on this certificate, documents that your employer has fulfilled these contractual obligations and you understand the information presented to you.

**\*\*\*\*\*DO NOT SIGN THIS FORM UNLESS YOU FULLY UNDERSTAND THIS INFORMATION\*\*\*\*\***

RESPIRATORY PROTECTION: I have been trained in the proper use and limitations of the type of respiratory protection devices to be used on this project. I have reviewed the written respiratory protection program manual and a copy is available for my use. Respiratory protection equipment has been provided, by the Contractor, at no cost to me.

TRAINING COURSE: I have been trained in the risks and dangers associated with handling asbestos, breathing asbestos dust, proper work procedures, personal protection and engineering controls. I have satisfactorily completed and Asbestos Safety Training Program for New York State and have been issued a New York State Department of Health Certificate of Asbestos Safety Training.

MEDICAL EXAMINATION: I have satisfactorily completed a medical examination within the last 12 months that meets the OSHA requirement for an asbestos worker and included at least 1) medical history 2) pulmonary function 3) medical examination 4) approval to wear respiratory protection devices and may have included an evaluation of a chest x-ray.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_ SS#: \_\_\_\_\_

Witness: \_\_\_\_\_ Date: \_\_\_\_\_



**Poughkeepsie CSD: 2020 Capital Improvement Project – Phase 1B Building Improvements**

**ESTIMATE OF ACM QUANTITIES**

\*\*\*\*\*

**EACH ABATEMENT CONTRACTOR SHALL READ AND ACKNOWLEDGE THE FOLLOWING NOTICE. A SIGNED AND DATED COPY OF THIS ACKNOWLEDGMENT SHALL BE SUBMITTED WITH THE ABATEMENT CONTRACTOR'S BID FOR THIS PROJECT. FAILURE TO DO SO MAY, AT THE SOLE DISCRETION OF THE OWNER, RESULT IN THE BID BEING CONSIDERED NON-RESPONSIVE AND RESULT IN DISQUALIFICATION OF THE ABATEMENT CONTRACTOR'S BID ON THIS PROJECT.**

\*\*\*\*\*

**\*\*\* NOTICE \*\*\***

***The linear and square footages listed within this specification are approximates. Abatement Contractor is required to visit the work locations prior to bid submittal in order to take actual field measurements within each listed location. The Abatement Contractor shall base their bid on actual quantities determined, by them, at the site walkthrough. Estimates provided in these specifications are for informational purposes only and shall not be considered a basis for Change Orders on this project.***

\*\*\*\*\*

**Acknowledgment:** I have read and understand the above **NOTICE** regarding removal quantity estimates and understand that estimates provided in these specifications are for informational purposes only and shall not be considered a basis for Change Orders on this project. The Abatement Contractor's signatory represents to the Owner that he/she has the authority of the entity he/she represents to sign this agreement on its behalf.

Company Name: \_\_\_\_\_  
Type or Print

BY: \_\_\_\_\_  
Signature Title Date

Print Name: \_\_\_\_\_



## ASSOCIATED ASBESTOS REMOVAL LOCATION DRAWINGS

### ➤ **Poughkeepsie CSD: 2020 Capital Improvement Project – Phase 1B Building Improvements**

- ❖ **NOTES-AA000** – General Asbestos Abatement Notes
- ❖ **CES AA001** – Clinton Elementary School – Lower-Level Overall Plan
- ❖ **CES AA002** – Clinton Elementary School – First Floor Overall Plan
- ❖ **CES AA003** – Clinton Elementary School – Second Floor Overall Plan
- ❖ **CES AA101** – Clinton Elementary School – Toilet Room Asbestos Abatement Plans
- ❖ **CES AA102** – Clinton Elementary School – Boiler Room Asbestos Abatement Plan
- ❖ **CCS AA001** – Columbus Elementary School – Lower-Level Overall Plan
- ❖ **CCS AA002** – Columbus Elementary School – First Floor Overall Plan
- ❖ **CCS AA003** – Columbus Elementary School – Second Floor Overall Plan
- ❖ **CCS AA101** – Columbus Elementary School – Toilet Room Asbestos Abatement Plans
- ❖ **KES AA001** – Krieger Elementary School – First Floor Overall Plan
- ❖ **KES AA002** – Krieger Elementary School – Second Floor Overall Plan
- ❖ **KES AA101** – Krieger Elementary School – Toilet Room Asbestos Abatement Plans
- ❖ **KES AA102** – Krieger Elementary School – Boiler Room Asbestos Abatement Plan
- ❖ **MES AA001** – Morse Elementary School – Lower-Level Overall Plan
- ❖ **MES AA002** – Morse Elementary School – First Floor Overall Plan
- ❖ **MES AA003** – Morse Elementary School – Second Floor Overall Plan
- ❖ **MES AA101** – Morse Elementary School – Toilet Room Asbestos Abatement Plans
- ❖ **MES AA102** – Morse Elementary School – Boiler Room Asbestos Abatement Plan
- ❖ **ELC AA001** – Smith Early Learning Center – Lower-Level Overall Plan
- ❖ **ELC AA002** – Smith Early Learning Center – First Floor Overall Plan
- ❖ **ELC AA003** – Smith Early Learning Center – Second Floor Overall Plan
- ❖ **ELC AA101** – Smith Early Learning Center – Toilet Room Asbestos Abatement Plans
- ❖ **ELC AA102** – Smith Early Learning Center – Boiler Room Asbestos Abatement Plan
- ❖ **WES AA001** – Warring Elementary School – Lower-Level Overall Plan and Window Asbestos Abatement
- ❖ **WES AA002** – Warring Elementary School – First Floor Overall Plan and Window Asbestos Abatement
- ❖ **WES AA003** – Warring Elementary School – Second Floor Overall Plan and Window Asbestos Abatement
- ❖ **WES AA101** – Warring Elementary School – Toilet Room Asbestos Abatement Plans
- ❖ **WES AA102** – Warring Elementary School – Boiler Room Asbestos Abatement Plan
- ❖ **WES AA103** – Warring Elementary School – Roof Asbestos Abatement Plan
- ❖ **PMS AA001** – Poughkeepsie Middle School – Lower-Level Overall Plan
- ❖ **PMS AA002** – Poughkeepsie Middle School – First Floor Overall Plan
- ❖ **PMS AA003** – Poughkeepsie Middle School – Second Floor Overall Plan
- ❖ **PMS AA004** – Poughkeepsie Middle School – Third Floor Overall Plan
- ❖ **PMS AA101** – Poughkeepsie Middle School – Lower-Level Toilet Room Asbestos Abatement Plans
- ❖ **PMS AA102** – Poughkeepsie Middle School – First Floor Toilet Room Asbestos Abatement Plans
- ❖ **PMS AA103** – Poughkeepsie Middle School – Second and Third Floor Toilet Room Asbestos Abatement Plans
- ❖ **PMS AA104** – Poughkeepsie Middle School – Boiler Room Asbestos Abatement Plan
- ❖ **PMS AA105** – Poughkeepsie Middle School – Roof Asbestos Abatement Plan
- ❖ **PHS AA001** – Poughkeepsie High School – First Floor Overall Plan
- ❖ **PHS AA002** – Poughkeepsie High School – Second Floor Overall Plan
- ❖ **PHS AA101** – Poughkeepsie High School – Toilet Room Asbestos Abatement Plans
- ❖ **PHS AA102** – Poughkeepsie High School – Toilet Room Asbestos Abatement Plans



- ❖ **PHS AA103** – Poughkeepsie High School – Locker Room Asbestos Abatement Plans
- ❖ **PHS AA104** – Poughkeepsie High School – Partial Roof Asbestos Abatement Plan

**END OF SECTION 02 0800**



**SECTION 02 4119  
SELECTIVE REMOVAL**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Removal of selected portions of building or structure.
  - 2. Removal of selected site elements.
  - 3. Salvage of existing items to be reused or recycled.

**1.03 DEFINITIONS**

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

**1.04 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, removal waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during removal remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

**1.05 PREINSTALLATION MEETINGS**

- A. Pre-removal Conference: Conduct conference at Project site.
  - 1. Inspect and discuss condition of construction to be selectively removed.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective removal schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective removal operations.
  - 5. Review areas where existing construction is to remain and requires protection.

**1.06 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For refrigerant recovery technician.
  - B. Schedule of Selective Removal Activities: Indicate the following:
    - 1. Detailed sequence of selective removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
    - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
    - 3. Coordination for shutoff, capping, and continuation of utility services.
    - 4. Use of elevator and stairs.
    - 5. Coordination of Owner's continuing occupancy of portions of existing building.
  - C. Pre-removal Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by removal operations.
-



- D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

#### **1.07 CLOSEOUT SUBMITTALS**

- A. Inventory: Submit a list of items that have been removed and salvaged.

#### **1.08 QUALITY ASSURANCE**

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

#### **1.09 FIELD CONDITIONS**

- A. Owner will occupy portions of building immediately adjacent to selective removal area. Conduct selective removal so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
1. Before selective removal, Owner will remove the following items:
- a. Any items to be retained by the Owner will have been removed by the Owner prior to start of work.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Present in buildings and structures to be selectively removed. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective removal operations.
1. Maintain fire-protection facilities in service during selective removal operations.
- G. Although care has been taken to ensure their accuracy, the locations shown for existing partitions, equipment, and structures indicated to be removed, nor their quantity, are guaranteed. It is the Contractor's responsibility to verify these conditions in the field during the bidding process before commencing work. No claims for extra payment due to incorrect locations, dimensions or quantities of items will be considered by the Owner.

#### **1.10 COORDINATION**

- A. Arrange selective removal schedule so as not to interfere with Owner's operations.

### **PART 1 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

### **PART 1 EXECUTION**

#### **3.01 EXAMINATION**

- A. Disconnect and cap utilities before starting selective removal operations.



- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building removal operations.
  - 1. Perform surveys as the Work progresses to detect hazards resulting from selective removal activities.
- C. Verify that hazardous materials have been remediated before proceeding with selective removal operations.

### **3.02 PREPARATION**

- A. Refrigerant: Before starting removal, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

### **3.03 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS**

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively removed.
  - 1. Arrange to shut off utilities with utility companies.
  - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective removal and that maintain continuity of services/systems to other parts of building.
  - 3. Disconnect and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
    - e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    - f. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

### **3.04 PROTECTION**

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
    - 1. Provide protection to ensure safe passage of people around selective removal area and to and from occupied portions of building.
    - 2. Provide temporary weather protection, during interval between selective removal of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
    - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective removal operations.
    - 4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 5000 "Temporary Facilities and Controls."
  - B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being removed.
    - 1. Strengthen or add new supports when required during progress of selective removal.
  - C. Remove temporary barricades and protections where hazards no longer exist.
-



### **3.05 SELECTIVE REMOVAL, GENERAL**

- A. General: Remove existing construction to the extent indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective removal systematically, from higher to lower level. Complete selective removal operations above each floor or tier before disturbing supporting members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  - 5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
  - 6. Maintain adequate ventilation when using cutting torches.
  - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  - 9. Locate selective removal equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - 10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective removal and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective removal.

### **3.06 SELECTIVE REMOVAL PROCEDURES FOR SPECIFIC MATERIALS**

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
  - B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
  - C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
  - D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
  - E. Roofing: Remove no more existing roofing than what can be covered in one day by new temporary roofing and so that building interior remains watertight and weathertight.
    - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
    - 2. Remove existing roofing system down to substrate.
-



### **3.07 DISPOSAL OF REMOVED MATERIALS**

- A. Remove waste materials from Project site.
  - 1. Do not allow removed materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn removed materials.

### **3.08 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective removal operations. Return adjacent areas to condition existing before selective removal operations began.

**END OF SECTION**



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## SECTION 02 8300 – LEAD SAFE WORK PRACTICES

### PART 1 - GENERAL

#### 1.1 DESCRIPTION/SCOPE OF WORK

- A. The work covered by these specifications shall consist of furnishing all labor, materials, tools, and equipment necessary to control and mitigate potential lead-based paint (LBP) hazards during demolition/renovation activities pertaining to the ***Poughkeepsie CSD: 2020 Capital Improvement Project – Phase 1B Building Improvements.***

The following is a detailed listing of identified Lead-based Paint(s) and/or Lead-containing Material(s), above the EPA action level of 1.0 mg/sq. cm.:

<b><u>TABLE I: IDENTIFIED LEAD-BASED PAINT</u></b> <b>POUGHKEEPSIE CSD</b> <b>2020 CAPITAL IMPROVEMENT PROJECT</b> <b>PHASE 1B: BUILDING IMPROVEMENTS</b> <b><u>(CONSTRUCTION AREAS)</u></b>				
Location	LBP Component	Substrate	Color	LBP Condition
<b>Poughkeepsie High School</b>				
Girl's Bathroom T-21	Wall Tile	Ceramic	Pink	Good
Girl's Bathroom T-1	Wall Tile	Ceramic	Pink	Good
Boy's Locker Room Office	Cove Base	Vinyl	Grey	Good
Nurse's Office Bathroom	Cove Base	Ceramic	Yellow	Good
Assistant Principal's NE Women's Bathroom	Cove Base	Vinyl	Black	Good
Assistant Principal's NE Women's Bathroom	Toilet	Ceramic	White	Good
Assistant Principal's NE Women's Bathroom	Sink	Ceramic	White	Good
<b>Poughkeepsie Middle School</b>				
Gym Men's Bathroom	Urinal	Ceramic	White	Good
Admin. Hallway Bathroom	Toilet	Ceramic	White	Good
Boy's Bathroom 128	Urinal	Ceramic	White	Good
Boy's Bathroom 165	Urinal	Ceramic	White	Good
Boy's Bathroom 215	Urinal	Ceramic	White	Good (5) Damaged (1)
Boy's Bathroom 246	Urinal	Ceramic	White	Good



Boy's Bathroom 316	Urinal	Ceramic	White	Good
Boy's Bathroom 343	Urinal	Ceramic	White	Good
Girl's Bathroom B65	Sink	Ceramic	White	Good
Boy's Bathroom B66	Urinal	Ceramic	White	Good
Boiler Room	Slop Sink	Ceramic	Black	Good
<b>Clinton Elementary School</b>				
Girl's Bathroom 120	Sink	Ceramic	White	Good
Girl's Bathroom 120	Radiator Cove Base (6")	Vinyl	Black	Good
Throughout Custodial Closets	Slop Sink	Ceramic	White	Good
Boy's Bathroom 104	Sink	Ceramic	White	Good
Girl's Bathroom 016	Sink	Ceramic	White	Good
Girl's Bathroom 211	Radiator Cove Base (6")	Vinyl	Black	Good
Boy's Bathroom 204	Sink	Ceramic	White	Good
Boy's Bathroom 204	Toilet	Ceramic	White	Good
<b>Warring Elementary School</b>				
Custodial Closets Throughout Building	Slop Sink	Ceramic	White	Good
Bathroom 208	Pipe	Metal	White	Good
Boy's Bathroom 124	Toilet	Ceramic	White	Good
Girl's Bathroom 123	Toilet	Ceramic	White	Good
Custodial Closet 125	Drain Pipe	Metal	Grey/Beige	Good
Bathroom 109	Pipe	Metal	White	Good
Boy's Bathroom 022	Cove Base	Ceramic	Light Blue	Good
Boy's Bathroom 022	Window Casing	Wood	Light Blue	Good
<b>George W. Krieger Elementary School</b>				
Throughout Gang Bathrooms	Lower Wall	Plaster	Green	Good
Throughout Custodial Closets	Wall	Plaster		Good
Throughout Custodial Closets	Pipe	Metal		Good
Girl's Bathroom 106	Toilet	Ceramic	White	Good



Bathroom 112 Sides A, B, C, D	Wall Tile	Ceramic	Green	Good
Bathroom 112 Side C	Sink	Ceramic	White	Good
Boy's Bathroom 137	Toilet	Ceramic	White	Good
Girl's Bathroom 204	Toilet	Ceramic	White	Good
<b>Morse Elementary School</b>				
Bathroom 8-6A	Cove Base	Vinyl	Black	Good
Bathroom 8-6A	Toilet	Ceramic	White	Good
Bathroom 8-6A	Sink	Ceramic	White	Good
Bathroom 8-2A	Cove Base	Vinyl	Black	Good
Bathroom 8-2A	Sink	Ceramic	White	Good
Bathroom 8-2A	Toilet	Ceramic	White	Good
Throughout Custodial Closets	Slop Sink	Ceramic	White	Good
Throughout Gang Bathrooms	Wall	Plaster		Good
Teacher's Conference Room Bathroom	Wall Tile	Ceramic	Light Blue	Good
Teacher's Conference Room Bathroom	Sink	Ceramic	White	Good
<b>Smith Early Learning Center</b>				
Gym Boy's Bathroom	Cove Base	Ceramic	Light Blue	Good
Classroom 101 Bathroom Sides B, C, D	Wall	Brick	Light Blue	Good
<b>Columbus Elementary School</b>				
Basement Women's Bathroom	Cove Base	Ceramic	White	Good
Basement Women's Bathroom	Wall/Ceiling	Plaster	Beige	Good
Basement Women's Bathroom	Ductwork	Metal	Beige	Good
Basement Women's Bathroom	Sink	Ceramic	White	Good
Basement Men's Bathroom	Cove Base	Ceramic	White	Good
Basement Men's Bathroom	Wall/Ceiling	Plaster	Blue/White	Good
Basement Men's Bathroom	Urinal	Ceramic	White	Good
Basement Men's Bathroom	Sink	Ceramic	White	Good
Women's Bathroom 114	Wall	Ceramic	Beige	Good



Women's Bathroom 114	Ceiling	Plaster	Beige	Good
Women's Bathroom 114	Window Sill	Wood	Beige	Good
Women's Bathroom 114	Sink	Ceramic	White	Good
Men's Bathroom 118	Wall	Ceramic	White	Good
Men's Bathroom 118	Wall/Ceiling	Plaster	Beige	Poor
Men's Bathroom 118	Window Sill/Casing	Wood	Beige	Good
Men's Bathroom 118	Sink	Ceramic	White	Good
Men's Bathroom 118	Urinal	Ceramic	White	Good
Men's Bathroom 118	Slop Sink	Ceramic	White	Good
Women's Bathroom 204	Stall Door	Wood	White	Good
Women's Bathroom 204	Wall Hatch	Wood	Beige	Good
Women's Bathroom 204	Window Sill	Wood	Beige	Good
Women's Bathroom 204	Wall/Ceiling	Plaster	Beige	Good
Women's Bathroom 204	Sink	Ceramic	White	Good
Men's Bathroom 227	Slop Sink	Plaster	Beige	Poor
Men's Bathroom 227	Window Sill/Casing	Wood	Beige	Good
Men's Bathroom 227	Sink	Ceramic	White	Good

The work of this Contractor shall include the following, and shall be as required by specific work-related tasks and disturbance(s) of above-referenced Lead-based Paint(s) and/or Lead-containing Material(s), above the EPA action level of 1.0 mg/sq. cm:

- 1) Personnel air monitoring and analysis.
  - 2) Waste characterization and classification.
  - 3) Transportation/disposal off-site of LBP wastes/debris and lead-contaminated waste/debris generated from LBP disturbance(s).
- B. Manual demolition, scraping and manual sanding of lead-based paint surfaces and power tool cleaning with dust collection systems shall be performed in conjunction with engineering and work practice controls meeting the requirements of 29 CFR 1926.62(e)(1).
- C. Components with lead-based paint shall be removed intact to the extent practicable. A 6-mil polyethylene drop cloth shall be placed on either side of the component, prior to its removal, to catch any paint chips that may become dislodged. The component shall be wrapped in a layer of 6-mil polyethylene for movement to the disposal container. Follow proper disposal requirements. The area around the component removal shall be wet wiped and HEPA



vacuumed, including the tent enclosure. The polyethylene sheeting shall be carefully folded in on itself and placed in a 6-mil disposal bag. Containment debris shall be properly disposed of as lead-based waste.

- D. Chemical stripping should be used for LBP removal on surfaces that will be subjected to welding, cutting or torch burning. No chemical strippers containing methylene chloride shall be used by the Contractor on this project. Abrasive blasting, heat stripping, uncontained hydroblasting, welding, cutting or torch burning shall not be performed on surfaces where LBP is present. Abrasive blasting, heat stripping, uncontained hydroblasting, welding, cutting or torch burning shall only be performed on bare metal substrate.
- E. The Contractor's use of a subcontractor shall not relieve the Contractor of full responsibility for the work to be performed.
- F. If available, the Contractor may submit exposure assessment data obtained within the last twelve (12) months from previous jobs conducted under similar conditions, control methods, work practices and environmental conditions to be used in this contract. Other objective data may be used to demonstrate that work activities in this contract will not result in occupational exposures to airborne lead that exceeds the PEL. The assessment shall include comparable lead concentrations in coating materials, work practices, engineering controls and rates of work.
- G. Until the exposure assessment is performed, the Contractor must provide to his workers the following: Respiratory protection with a minimum protection factor of 10, personal protective clothing, lead-free change areas, hand washing/shower facilities, biological monitoring and training per 29 CFR 1926.62.

This Specification shall be used as a Guideline for the use of Contractors who complete the demolition/renovation activities pertaining to the ***Poughkeepsie CSD: 2020 Capital Improvement Project – Phase 1B Building Improvements*** as detailed within Section #1.2 of this specification. The intent of this Specification is to remain in conformance with 29 CFR 1926.62 and to maintain an airborne concentration of lead-dust below the action level. This Specification is written in order to outline the worst-case scenario in regard to lead safe work practices. However, the work procedures section is written in a manner, which outlines the requirements that should be necessary, at a minimum, to maintain an airborne concentration of lead dust below the action level.

- H. The Contractor shall ensure that any HVAC equipment intakes within and around the work areas are protected by shutting down the units and/or installing HEPA filters over the intake. The Contractor shall coordinate rebalancing of the HVAC equipment prior to installing the HEPA filters. The Contractor shall alter the size and extent of the isolation barriers as necessary due to weather conditions, functional space use and density of building occupants in the vicinity, as required.

## 1.2 REGULATIONS & REFERENCE STANDARDS

- A. General Requirements

All work of this section shall be conducted in strict accordance with all applicable Federal, State and Local regulations.



Matters of interpretations of the standards and regulations shall be submitted to the appropriate agency for resolution before starting work. Where these requirements vary the most stringent shall apply.

B. Specific Requirements

1. American National Standards Institute (ANSI)
  - a. ANSI Z9.2-79 – Fundamentals Governing the Design and Operation of Local Exhaust Systems.
  - b. Z88.2-80 – Practice for Respiratory Protection.
2. Title X - U.S. Department of Housing and Urban Development “Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing.”
3. Code of Federal Regulations (CFR)
  - a. 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response.
  - b. 29 CFR Part 1910.134 – Respiratory Protection.
  - c. 29 CFR Part 1910.146 – Confined Space Entry Program.
  - d. 29 CFR Part 1910.1025 – Lead.
  - e. 29 CFR Part 1910.1200 – Hazard Communication.
  - f. 29 CFR Part 1926.55 – Gases, Vapors, Fumes, Dusts and Mists.
  - g. 29 CFR Part 1926.57 – Ventilation.
  - h. 29 CFR Part 1926.62 – Lead (Construction Industry Standard).
  - i. 40 CFR Part 260 – Hazardous Waste Management Systems: General.
  - j. 40 CFR Part 261 – Identification and Listing of Hazardous Waste.
  - k. 40 CFR Part 262 – Generators of Hazardous Wastes.
  - l. 40 CFR Part 263 – Transporters of Hazardous Waste.
  - m. 40 CFR Part 264 – Owners and Operators of Hazardous Waste Treatment, Storage & Disposal Facilities.
  - n. 40 CFR Part 265 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage & Disposal Facilities.
  - o. 40 CFR Part 268 – Land Disposal Restrictions.
  - p. 40 CFR Part 745 – Lead; Requirements for Lead-Based Paint Activities in Child Occupied Facilities
  - q. 40 CFR Part 745.90 – EPA’s Renovation, Repair & Painting Rule.



- r. 49 CFR Parts 170-178 – Department of Transportation Regulations.
- 4. New York Codes of Rules and Regulations (NYCRR)
  - a. 6 NYCRR Part 360 – Solid Waste Regulations.
  - b. 6 NYCRR Part 364 – Waste Transporter Permits.
  - c. 6 NYCRR Part 370-373 – Hazardous Waste Regulations.
  - d. 8 NYCRR Part 155 – Uniform Safety Standards for School Construction & Maintenance Projects.
- 5. Steel Structures Painting Council (SSPC)
  - a. SSPC-Guide 6 – Guide for Containing Debris Generated During Paint Removal Operations.  
  
SSPC-Guide 7 – Guide for the Disposal of Lead-Contaminated Surface Preparation Debris.  
  
Preparation Debris.
- 6. Underwriters Laboratories. Inc. (UL)
  - a. UL 586 – High Efficiency, Particulate Air Filter Units.

### 1.3 DEFINITIONS

- A. Abatement  
For the purposes of this Specification, the term abatement shall refer to any procedure that impacts lead-based paint on any surface. Procedures can include: paint removal; whole removal of the surface (i.e. window replacement); demolition of painted surfaces; and clean-up of paint debris.
- B. Action Level  
Employee exposure without regard to use of respirators, to an airborne concentration of lead of thirty (30) micrograms per cubic meter of air averaged over an 8-hour period. As used in this section, micrograms per cubic meter of air” refers to the action level. (Note: For longer exposure period lower action level is triggered).
- C. Area Monitoring  
Sampling of lead concentrations within the lead control area (work area) and inside the physical boundaries which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
- D. Physical Boundary  
Area physically roped or partitioned off around a work area to limit unauthorized entry of personnel. As used in this section, “inside boundary” shall mean the same as “outside lead control area.”
- E. Change Rooms and Shower Facilities



Rooms within the designated physical boundary around the work area equipped with separate storage facilities for clean protective work clothing and equipment and for street clothes which prevent cross-contamination.

- F. Decontamination Room  
Room for removal of contaminated personal protective equipment (PPE).
- G. Eight-Hour Time Weighted Average (TWA)  
Airborne concentration of lead averaged over an 8-hour workday to which an employee is exposed.
- H. High Efficiency Particulate Air (HEPA) Filter Equipment  
HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.
- I. Lead Control Area  
A work area within which engineering controls are implemented to prevent the spread of lead dust, paint chips or debris from lead-containing paint removal operations. The lead control area is isolated by physical boundaries to prevent entry of unauthorized personnel.
- J. Lead Permissible Exposure Limit (PEL)  
Fifty (50) micrograms per cubic meter of air as an 8-hour time weighted average as determined by 29 CFR Part 1926.62. If an employee is exposed for more than 8 hours in a work day, the PEL shall be determined by the following formula:  
$$\text{PEL (micrograms/cubic meter of air)} = 400/\text{No. hrs worked per day}$$
- K. Personal Monitoring  
Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR Part 1926.62. Samples shall be representative of the employees work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders with a radius of 6 to 9 inches and the center at the nose or mouth.
- L. Wipe Sampling  
Clearance testing procedures, which determine the amount of existing lead-based paint surface dust by atomic absorption spectroscopy analysis, or inductively coupled plasma emission spectrometry expressed in micrograms of lead.

#### 1.4 QUALITY ASSURANCE

- A. Qualifications
  - 1. Contractor: Certification that the Contractor has prior experience on LBP activity projects similar in nature and extent to ensure the capability to perform the required work procedures in a satisfactory manner.
  - 2. Competent Person: Certification that the Contractor's full-time onsite Competent Person meets the competent person requirements of 29 CFR Part 1926.62 and is experienced in administration and supervision of LBP activity projects, including work practices, protective measures for building and personnel, disposal procedures, etc. This person shall have completed a Contractor Supervisor LBP abatement course by an EPA Training Center or



an equivalent certification course, and have had a minimum of 2 years on-the-job experience.

3. **Testing Laboratory:** The name, address, and telephone number of the independent testing laboratory selected to perform sampling and analysis for personal and area air samples and wipe samples, and TCLP analysis of LBP wastes and debris. Documentation that the laboratory performing the analysis is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that it is listed proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT), and a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. Certification shall include accreditation for heavy metal analysis, list of experience relevant to analysis of lead in air, and a Quality Assurance and Quality Control Program. Currently, the American Association for Laboratory Accreditation (ASLA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors. Documentation shall include the date of accreditation or reaccreditation.
4. **Blood Lead Testing Laboratory:** The name, address and telephone number of the blood lead testing laboratory; the laboratory's listing by OSHA and the U.S. Public Health Service Center for Disease Control (CDC); and documentation that the laboratory certified in the state where the work site is located.

**B. Respiratory Protection Devices**

Manufacturer's certification of NIOSH for respiratory protection devices utilized on the site.

**C. Cartridges, Filters, and Vacuum Systems**

Manufacturer's certification of NIOSH approval of respirator cartridges (organic vapor, acid gas, mist, dust, high efficiency particulate); High Efficiency Particulate Air (HEPA) filtration capabilities for all cartridges, filters, and HEPA vacuum systems.

**D. Medical Examination and Records**

Certification that employees who are involved in LBP abatement work have received medical examinations and will receive continued medical surveillance, including biological monitoring, as required by 29 CFR Part 1926.62, 29 CFR Part 910.1200, 29 CFR Part 1910.120 and by the state and local regulations pertaining to such work. Records shall be retained, at Contractor expense, in accordance with 29 CFR Part 1910.20.

1. Provide medical surveillance to workers until exposure monitoring reveals that workers are not exposed on any day of the job to airborne lead at or above the Action Level of 30 ug/dL of blood. This consists of a blood test measuring the level of lead and zinc protoporphyrin by a licensed physician. Further testing and medical exams may be necessary depending on the results of initial blood tests and/or the initial exposure assessment.

**E. Training**

Training certification shall be provided prior to the start of work involving LBP abatement, for all of the Contractors' workers, supervisors and Competent Person. Training shall meet the requirements of 29 CFR Part 1926.62, 29 CFR Part 1926.59, 29 CFR Part 1910.1200, 29 CFR Part 1910.120 and 49 CFR 172, and that required by EPA or the state LBP course for the work to be performed. Training shall be provided prior to the time of job assignment and, at least, annually. The project specific training shall, at a minimum, include the following.

1. Specific nature of the operation, which could result in exposure to lead.
2. Purpose, proper selection, fitting, use and limitations of respirators.



3. Purpose and description of the medical surveillance program and the medical removal protection program, including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant.)
4. Relevant engineering controls and good work practices.
5. The contents of any compliance plan in effect.
6. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
7. The employee's right of access to records under 29 CFR part 1910.20.

F. Respiratory Protection Program

1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 12 months thereafter as required by 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
2. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
3. All workers are required to don an appropriate level of protection commensurate with the airborne concentrations of lead in which they are working. The level of protection will be determined by the Contractor, based on objective air monitoring data.

G. Licenses and Permits

Copies of licenses and permits as required by applicable Federal, state and local regulations shall be obtained before the start of the LBP project.

## 1.5 SUBMITTALS

- A. The submittals shall be submitted in accordance with Specification Section 01300, Submittals.
- B. **Certifications**  
Prior to the start of work, submit required certifications, plans, programs, permits and licenses identified in Paragraph 1.5 of this specification section.
- C. **Equipment List**  
Prior to the start of work submit list of equipment items to be used in the work, including brand names, model, capacity, performance characteristics, quantities and other pertinent information.
- D. **Lead-Based Paint (LBP) Management Plan**  
The contractor shall prepare a detailed LBP Management Plan that identifies the work procedures, health and safety measures to be used in LBP work procedures; and that addresses spill prevention, containment and emergency response procedures. The plan shall address the methods to be undertaken to abate the lead to include the following key elements:



- 
1. LBP containment methods to control employee exposure to lead at or below the permissible exposure limit and to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not exceeded outside of the lead control area.
  2. Training requirements as required by Federal, state and local regulations.
  3. Unique problems associated with the LBP project.
  4. Sketch of location, size and details of LBP control areas, decontamination rooms/areas, change rooms and shower facilities.
  5. Eating, drinking, smoking, and rest room procedures.
  6. Sequencing of LBP related work.
  7. Personnel protective equipment and respiratory protection program, including controls.
  8. Engineering controls, containment structures and safety measures.
  9. Worker exposure assessment procedures.
  10. Work Practice controls.
  11. Housekeeping.
  12. Hygiene facilities and practice.
  13. Medical surveillance, including medical removal procedures.
  14. Sampling, testing and analytical methods to include personnel air sampling requirements of 29 CFR Part 1926.62, wipe sampling of the surface where the LBP was removed and, when required, toxicity characteristic leaching procedure (TCLP) testing of the waste material in accordance with 40 CFR 261 and 6 NYCRR Part 371, and area air sampling required by the specifications. Procedures must include frequency, locations, sampling and analytical methods to be used.
- E. Compliance Program  
Contractor's Compliance Program prepared in accordance with 29 CFR Part 1926.62 (e) (2).
- F. Waste Transporter and Disposal Facility Permits, and Disposal Documents.
1. Name, address and telephone number of 6 NYCRR Part 364 transporter who will be transporting the LBP wastes and debris and a copy of the transporter's 6 NYCRR Part 364 permit.
  2. Name, address and telephone number of disposal facility accepting the LBP wastes and debris and a copy of the permit from the disposal facility documenting the facility is permitted to accept the wastes being delivered.
  3. Copy of completed waste characterization (waste profile) forms for obtaining approval to dispose of the LBP wastes and liquid wastes at the disposal facility.
  4. Copy of the approved waste characterization (waste profile) forms from the disposal facility indicating they are permitted to accept the wastes and will accept the wastes being delivered.
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5. Example of completed transportation and disposal documents (i.e., bill of lading or hazardous waste manifest and land disposal restriction notification forms, as applicable) prior to shipment of wastes.
  6. Copy of the completed and signed transportation and disposal documents at time of shipment for the disposal of LBP wastes and debris, liquid wastes and any other wastes generated, and copy signed by the disposal facility.
  7. Copy of certificate of destruction for incinerated wastes, certificate of treatment and/or certificate of disposal, as applicable and associated tracking documents from the final disposal facility for disposal of the LBP wastes and debris.
- G. Health and Safety Plan And Confined Space Entry Program  
Contractor's written site specific Health and Safety Plan prepared in accordance with 29 CFR Part 1910.120 and Contractor's confined space entry program prepared in accordance with 29 CFR Part 1910.146. These documents are requested for information only and as documentation that they exist.
- H. Sampling and Laboratory Analysis Reports  
Submit field sampling logs for all personal and area air samples, wipe samples and waste samples taken, and submit copy of laboratory analysis reports and chain of custody records for all sample analysis.
- I. Competent person certification per Section 3.5.B.

## **1.6 POSTED WARNINGS & NOTICES**

The following regulations, warnings and notices shall be posted at the work site in accordance with 29 CFR Part 1926.62.

- A. Regulations  
A copy of applicable Federal, state, and local regulations shall be maintained at the work site.
- B. Warning Signs  
Warning signs shall be provided at approaches to LBP control areas. Signs shall be located at a distance from the LBP control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the LBP control area. The signs shall comply with the requirements of 29 CFR Part 1926.62.
- C. Worker Information  
Right-to-know notices shall be placed in clearly visible areas of the work site in compliance with Federal, State and Local regulations.
- D. Air Monitoring Results  
Daily air monitoring results shall be prepared in order to be easily understood by the workers and shall be placed in a clearly visible area of the work site.
- E. Emergency Telephone Numbers  
A list of telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, Government and Contractor representatives who can be reached 24 hours per day and professional consultants directly involved in the project.

## **1.7 EQUIPMENT & MATERIALS**



Sufficient quantities of health and safety materials required by 29 CFR Part 1926.62, and other materials and equipment needed to complete the project, shall be available and kept on the site.

A. Respirators

Air-purifying respirators shall be approved by NIOSH for use with dust, fumes and mists having permissible exposure limits less than 0.05 milligrams per cubic meter (i.e., have high-efficiency particulate air (HEPA) filters) and for other hazardous airborne contaminants that may be encountered, as determined by the Competent Person. The Contractor shall furnish, at no cost to personnel/employee, respirators to provide protection from airborne concentrations of lead. Respirators shall comply with the requirements of 29 CFR Part 1926.62 and shall be used in accordance with 29 CFR Part 1926.62, 29 CFR Part 1926.103 and 29 CFR Part 1910.134.

B. Respirator Cartridges

A sufficient supply of respirator cartridges shall be maintained at the work site to provide new cartridges to employees and authorized visitors, throughout the duration of the project. Cartridges shall be replaced according to the manufacturer's recommendations, when breathing becomes difficult, or if the cartridge becomes wet.

C. Protective Clothing

1. The Contractor shall furnish, at no cost to personnel/employee, equipment/ clothing for protection from airborne and waterborne LBP debris. An adequate supply of these items shall be available for worker and authorized visitor use. Workers and visitors shall not take protective clothing and equipment off the work site at any time. Protective clothing includes:

- a. Coveralls (Whole Body Protective Coverings): Full-body coveralls and head covers shall be worn by workers in the work area as necessary. Sleeves shall be secured at the wrist and pants legs at the ankle with tape. Permeable clothing shall be provided in heat-stress conditions. Where non-disposable coveralls are provided, these coveralls shall be cleaned after each wearing. Cleaning of coveralls and other non-disposable clothing shall be in accordance with the provisions for cleaning in 29 CFR Part 1926.62.
- b. Boots: Work boots with nonskid soles or impermeable work boot covers shall be worn by workers. Where required by OSHA, safety boots (steel toe or steel toe and shank) shall be worn. Paint the uppers of boots red with waterproof enamel. Do not allow boots to be removed from the work area for any reason after being contaminated with LBP debris. Dispose of boots as LBP contaminated waste at the end of the work.
- c. Gloves: Inner gloves, appropriate for items and hazards encountered and disposable outer work gloves shall be provided to each worker and shall be worn while the worker is in the work area. Glove material shall be appropriate for the specific chemical exposure. Gloves shall not be removed from the work area and shall be disposed of as LBP contaminated waste at the end of the work.
- d. Hard Hats: Head protection (hard hats) shall be provided as required by OSHA for workers and authorized visitors. Protective plastic-strap suspension hats shall be used. Hard hats shall be worn at all times that work is in progress. Hats shall remain in the work area until the project is completed. Hats shall be thoroughly



cleaned, decontaminated and bagged before being removed from the work area at the end of the project.

- e. Eye Protection: Fog-proof goggles for personnel engaged in LBP operations shall be worn when the use of a full-face piece respirator is not required.

D. Negative Air Pressure System

When a LBP control area requires the use of an airtight containment barrier, a negative air pressure system shall be used and pressure differential recordings taken. LBP shall not be removed from the LBP control area until the proper engineer controls and HEPA filtration systems are in place.

1. HEPA Filter Requirements

The negative air pressure system shall be equipped with approved HEPA filters per UL 586. Negative air pressure equipment shall be equipped with new HEPA filters, and shall be sufficient to maintain a minimum pressure differential of minus 5 Pa (0.02 inch) of water column relative to adjacent, unsealed areas. Negative air pressure system minimum requirements are listed below.

- a. The unit shall be capable of delivering its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place.
- b. The HEPA filter shall be certified as being capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent.
- c. The unit shall be capable of continuing to deliver no less than 70 percent of rated capacity when the HEPA filter is 70 percent full or measures 620 Pa (2.5 inches of water) static pressure differential on a magnehelic gauge.
- d. The unit shall be equipped with a manometer-type negative pressure differential monitor with minor scale division of 0.02 inch of water and accuracy within plus or minus 1.0 percent. The manometer shall be calibrated daily as recommended by the manufacturer. Record manually manometer readings of the pressure differential between the LBP control area and adjacent unsealed areas at the beginning of each workday and every 2 working hours thereafter.
- e. The unit shall be equipped with a means for the operator to easily interpret the readings in terms of the volumetric flow rate of air per minute moving through the machine at any given moment.
- f. The unit shall be equipped with an electronic mechanism that automatically shuts the machine off in the event of a filter breach or absence of a filter.
- g. The unit shall be equipped with an audible horn that sounds an alarm when the machine has shut itself off.
- h. The unit shall be equipped with an automatic safety mechanism that prevents a worker from improperly inserting the main HEPA filter.
- i. The unit shall be ducted through the containment barrier wall to the outside of the work area. The unit shall not be exhausted into any work area.

2. Number of Units Required

The air within the containment barrier shall be changed at least once every 15 minutes by a continuously operating negative air pressure system, until the LBP control area



barrier is removed. Filters shall be replaced as necessary to maintain the efficiency of the system. A back-up unit shall be maintained onsite.

3. **Auxiliary Generator**  
An auxiliary generator shall be provided with a capacity adequate to power a minimum of 50 percent of the negative air machines at any time during the work. When power fails, the generator controls shall automatically start the generator and switch the negative air machine to generator power. The generator shall not present a carbon monoxide hazard to workers.
4. **Discontinuing Negative Air Pressure System**  
The negative air pressure system shall not be shut down during LBP work unless authorized by the Owner's Consultant. At the completion of the LBP work procedures and disposal project, units shall be run until full cleanup has been completed and wipe clearance samples have been collected, analyzed and have passed final clearance testing requirements. Dismantling of the negative air pressure systems shall conform to the written decontamination procedures. Prefilters shall be removed and properly disposed. The intake to the machines shall be sealed with polyethylene to prevent environmental contamination.

E. **Expendable Supplies**

1. **Polyethylene Sheet and Bags - General**  
Polyethylene sheet and bags shall be minimum 6-mil thick. Bags shall have pre-printed labels, and 5-inch (minimum) long plastic ties, pointed and looped to secure the filled bags. Polyethylene sheets shall be in roll sizes to minimize seams.
2. **Polyethylene Sheet - Flame Resistant**  
Where a potential for fire exists, flame-resistant polyethylene sheets shall be provided. Polyethylene film shall conform to the requirements of NFPA 701.
3. **Polyethylene Sheet - Reinforced**  
Reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the LBP control area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.
4. **Tape and Adhesive Spray**  
Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.
5. **Containers**  
DOT approved impermeable containers shall be used to receive and retain LBP waste and debris, and lead contaminated material until disposal. Containers shall be labeled in accordance with EPA, DOT and OSHA standards.
6. **Chemicals**  
Chemicals, including caustics and paint strippers, shall be properly labeled and stored in leak-tight containers.



- F. Vacuum Systems  
HEPA filtered vacuum systems shall be used during LBP operations which generate dust. The systems shall be suitably sized for the project, and filters shall be capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent.
- G. Heat Blower Guns  
Heat blower guns shall be flameless, electrical, paint-softener type with controls to limit temperature to 590 degrees C (1,100 degrees F). Heat blower shall be DI (non-grounded) 120 Vac, and shall be equipped with cone, fan, glass protector and spoon reflector nozzles.
- H. Chemical Paint Strippers  
Chemical paint strippers shall contain no methylene chloride.
- I. Chemical Paint Stripper Neutralizer  
Neutralizers for paint strippers shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

## **1.8 STORAGE OF MATERIALS**

Materials shall be stored in a place and manner, which protects them from damage and contamination. During periods of cold weather, plastic materials shall be protected from the cold. Regularly inspect materials to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Stored materials shall not present a hazard or an inconvenience to workers, visitors and/or other employees.

## **PART 2 – PRODUCTS**

**(NOT APPLICABLE)**

## **PART 3 – EXECUTION**

### **3.1 WORK PROCEDURES**

LBP work procedures and related work shall be performed in accordance with the U.S. Department of Housing and Urban Development "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" and the accepted Contractor's LBP Management Plan. Procedures and equipment required to limit occupational and environmental exposures to lead during LBP removal shall be in accordance with 29 CFR Part 1926.62 and as specified herein. LBP waste and debris, lead contaminated debris and personal protective clothing and equipment shall be disposed of in compliance with Federal, state, and local regulations.

- A. Personnel Protection Procedures  
Personnel shall wear and use protective clothing and equipment as specified and required by 29 CFR Part 1926.62 and 29 CFR Part 1910.120. Eating, smoking, drinking, chewing tobacco and chewing gum, and applying makeup shall not be permitted in the LBP control area. Personnel of trades not engaged in the LBP work procedures and disposal of LBP shall not be exposed at any time to airborne concentrations of lead equal to or in excess of 30 micrograms



per cubic meter of air. Electrical service shall be disconnected when wet removal is performed, and temporary electrical service protected by a ground fault circuit interrupter shall be provided.

B. Safety and Health Procedures

The Competent Person shall be present on the work site throughout the LBP project to supervise, monitor and document the project's health and safety provisions. A daily log shall be maintained showing the results of sampling tests throughout the project area. LBP work being conducted within a LBP Control area where an airtight barrier is required shall be stopped if measured airborne lead concentrations, collected during LBP work procedures, exceed the pre- LBP work procedures airborne concentration levels.

C. Safety and Health Responsibilities

The Competent Person shall:

1. Verify that training meets applicable requirements.
2. Review and approve LBP Management Plan for conformance to the applicable referenced standards.
3. Inspect LBP removal work for conformance with the accepted LBP Management Plan.
4. Ensure that worker exposure air monitoring activities are in accordance with 29 CFR Part 1926.62.
5. Ensure work is performed in strict accordance with specifications.
6. Ensure hazardous exposure to personnel and to the environment are adequately controlled.
7. The Contractor's Competent Person shall be responsible for directing personal air monitoring.
8. The Owner's Consultant shall be responsible for directing area and final air/wipe testing.

D. Medical Surveillance Procedures

Medical surveillance shall be implemented in accordance with the accepted Contractor's LBP Management Plan, and shall comply with the requirements of 29 CFR Part 1926.62, including the provisions for biological monitoring, medical removal, protection and a physician's written opinion, signed by the physician performing the employee examination. The Contractor shall provide a copy of the written opinion for Contractor's employees prior to each employee's commencement of work.

E. Engineering Controls and Containment Structures

Engineering and work practice controls are the primary means of maintaining exposures to lead below the PEL. Paint removal and surface preparation activities must keep dust levels at a minimum. Torch cutting of surfaces with LBP will require appropriate personal protective equipment and exposure controls. Power tools must be equipped with vacuum shrouds including a high efficiency particulate air filtered vacuum system attached.

1. LBP Control Area

The LBP control area is where LBP work procedures occur and as such shall be considered contaminated. The LBP control area shall be isolated to prevent LBP containing dust or debris from passing into adjacent open areas. The control area shall be decontaminated at the completion of the LBP work procedure and disposal work.



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2. **Boundary Requirements.**  
Physical boundaries shall be provided around exterior LBP control areas by roping off the area indicated in the LBP Management Plan.
  3. **Control Barriers**  
The LBP control area shall be designated and separated from other outside areas with control barriers. The polyethylene sheeting shall have all openings masked and sealed. The LBP control area shall be erected according to the Contractors LBP Management Plan. Polyethylene sheeting shall be mechanically supported, independent of duct tape or spray adhesive.
  4. **Masking and Sealing**
    - a. **Exterior LBP control area requirements:** Where the construction of a contained LBP control area is impractical or not required based on the method of lead work procedures, a roped-off perimeter shall be installed 20 feet from and around the area where the LBP handling procedures are performed and other requirements for LBP control areas shall be maintained. Personal monitoring of airborne concentrations shall be conducted in adjacent areas during the work shift, in accordance with 29 CFR Part 1926.62. Area air monitoring inside and outside of the roped-off perimeter shall be conducted as specified. Airborne concentrations shall not exceed specified levels.
  5. **Personnel Decontamination Unit**  
Personnel decontamination units shall be provided when required for the LBP procedures. Materials fabricated or delivered to the site before the shop drawings have been returned to the Contractor will be subject to rejection by the Owner's Consultant. Specifications and drawings of portable prefab units, such as a trailer unit, if utilized, must be submitted for review and approval before start of construction. Submittal shall include, but not be limited to, a floor plan layout showing dimensions, materials, sizes, thickness, plumbing, and electrical outlets. Access between contaminated and uncontaminated areas shall be through an airlock. Access between any two rooms or room and trailer within the decontamination unit shall be through a plastic sheeting curtained doorway. A separate equipment decontamination unit shall be provided. Each work area shall have an emergency exit. The personnel decontamination unit's clean room shall be the only means of entrance and exit, except for emergencies, from the LBP control area. Materials shall exit the LBP control area through the equipment decontamination area.
  6. **Clean Room**  
The clean room shall have only one exit to non-contaminated areas of the site. An airtight seal shall be constructed of polyethylene between the clean room and uncontaminated areas. Surfaces of the clean room shall be protected with sheet polyethylene. A temporary unit with a separate equipment decontamination locker room and a clean locker room shall be provided for personnel who are required to wear whole body protective clothing. One locker shall be provided in each locker room for each LBP worker, and each Contractor's representative. Lead-free personal clothing and shoes shall be kept in the clean locker. Hand wash station/showers shall be located between the equipment decontamination locker room and the clean locker room, and employees shall wash or shower before changing into personal clothes. An adequate supply of clean disposable towels shall be provided. LBP contaminated work clothing shall be cleaned. Clean rooms shall be physically attached to the LBP control area for areas
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inside the building but may be directly adjacent to the LBP control area outside of the building. Joint use of this space for other functions, such as offices, equipment storage, etc., is prohibited.

7. Hand Wash Station/Shower Room

An operational shower and hand washing station shall be provided between the work area and the clean changing room. Workers shall wash and/or shower before entering the clean changing room. Shower room shall be separated from other rooms by air-tight walls fabricated from polyethylene sheeting. Water shall be hot and cold or warm. Shower heads/ controls, soap dish, continuing supply of soap, and clean towels shall be provided. The shower shall be maintained in a sanitary condition. Waste water shall be pumped to drain and through waste water filters that meet state and/or local requirements. These filters shall be located inside the shower unit and filters shall be changed regularly. Spent filters shall be discarded as LBP contaminated waste.

8. Equipment Decontamination

The Equipment Decontamination Unit shall be used for removal of equipment and materials from the LBP control area, and shall include a wash room, holding room, and an enclosed walkway. The unit shall be constructed from wood framing material and polyethylene sheeting. Workers shall not enter or exit the LBP control area through the Equipment Decontamination Unit. A washdown station, consisting of an enclosed shower unit, shall be located in the work area outside the Wash Room. The washdown station shall be used to clean equipment, bags and containers. Bagged or containerized LBP wastes shall be passed from the work area and cleaned in the Wash Room. The Wash Room shall be separated from the work area by a polyethylene sheet flap. Wastewater shall be filtered and filters shall be changed as required for the shower unit and the Wash Room. Filters shall be disposed of as LBP contaminated wastes. The Holding Room shall be used as a drop location for bagged LBP passed from the Wash Room. This room shall be constructed so that bagged materials cannot be passed from the Wash Room through the Holding Room to the enclosed walkway. The walkway shall provide access to the Holding Room from outside the work area. The enclosed walkway shall be separated from the exterior by a single flap of polyethylene sheeting. The Contractor's equipment used for LBP work procedures shall be decontaminated prior to its removal outside of the lead control area. The decontamination water shall be containerized, the containers labeled, the liquid sampled and analyzed in the laboratory for lead, and properly disposed of off-site according to applicable Federal, State and Local regulations. See Paragraph 3.5.C.2.

9. Maintenance of Decontamination Units

Barriers and polyethylene sheeting shall be effectively sealed and taped. Containment barriers shall be visually inspected at the beginning of each work period. Damaged barriers and defects shall be immediately repaired upon discovery. Smoke testing methods shall be used to test effectiveness of barriers when directed by the Owner's Consultant.

10. LBP Control Area Exiting Procedures

Personnel exiting a LBP control area shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

- a. HEPA vacuum all protective clothing before removing.
- b. Remove protective clothing in the decontamination room and place this clothing in an approved impermeable disposal bag.
- c. Wash or shower.



- d. Change to clean clothes prior to leaving the physical boundary designated around the lead-contaminated work site.

F. Temporary Utilities

- 1. Temporary equipment as necessary to provide adequate power, light, heat, and water shall be installed, as needed, to accomplish the LBP operations properly and safely. The Contractor shall maintain the security and maintenance of the utility system in the LBP control areas. In the event of a failure of any utility system, the Owner will not be responsible for any loss of time or other expense incurred by the Contractor. In addition to any site-specific temporary utility requirements, the Contractor shall provide:
  - a. Back-flow protection on all water connections is required. Fittings installed by the Contractor shall be removed after completion of work with no damage or alteration to existing water piping and equipment.
  - b. When applicable, heavy-duty abrasion-resistant hoses to provide water to each work area and decontamination area.
  - c. A hot water heater, if necessary, to provide warm water to the decontamination showers.
  - d. Electrical service to work areas. Electrical service shall comply with National Electric Code, State and Local requirements and UL standards. Warning signs shall be posted at power outlets, which are other than 110-120 volt power. Only grounded extension cords shall be used. Incandescent lamps and light fixtures shall be of adequate wattage to provide good illumination in LBP control areas.
  - e. Temporary heating units, when needed, that have been tested and labeled by UL, FM, or another recognized trade association related to the fuel being consumed. Forced air or fan type units shall not be utilized inside a work area. Units shall have tip-over protection.
  - f. Sufficient quantity of single-occupant, self-contained chemical toilets, properly vented and fully enclosed.

**3.2 LEAD-BASED PAINT WORK PRACTICES (Use methods as applicable)**

A. Component Removal:

Components shall be removed intact to the extent practicable. A 6-mil polyethylene drop cloth shall be placed on either side of the component, prior to its removal, to catch any paint chips that may become dislodged. The component shall be wrapped in a layer of 6-mil polyethylene for movement to the disposal container. Follow proper disposal requirements. The area around the component removal shall be wet wiped and HEPA vacuumed, including the tent enclosure. The polyethylene sheeting shall be carefully folded in on itself and placed in a 6-mil disposal bag. Containment debris shall be properly disposed of as lead-based waste.

Clearance will be performed as follows:

- 1. Visual Clearance - Determine that all required work has been completed. Look for settled dust, paint chips or debris in work area. If located, cleanings will commence until visual inspection locates no evidence of dust.



2. The Owner's Consultant shall perform Dust and/or Soil Sampling as outlined in the U.S. Department of Housing and Urban Development "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing".

B. Chemical Stripping: Assumed Exposure ( $50 \text{ ug/m}^3$  -  $500 \text{ ug/m}^3$ )

Chemical stripping, using an agent approved by the Owner's Consultant, followed by wet scraping is the preferred method of abatement for areas where torch cutting, welding and/or other hot-work will affect building components coated with lead-based paint or lead containing coatings. The specific stripping agent(s) proposed must be approved by the Owner. No chemical strippers containing methylene chloride shall be used by the Contractor on this project.

1. Horizontal surfaces directly below and at least 10' in a radial direction from the area where chemical stripping is to be performed shall be protected with 6-mil poly.
2. All LBP on specified surfaces shall be removed to the bare substrate. The job is not considered complete until the substrate is dry and free of paint, debris, and LBP residue.
3. LBP stripping agents shall be brushed or troweled on the designated surfaces, or otherwise applied in accordance with manufacturer's specifications. The minimum thickness of chemical stripping agent applied shall be 0.125 (1/8) inches or the manufacturer's recommendations.
4. Stripping agents shall not be applied to, nor be allowed to inadvertently penetrate, wood and/or other porous substrates.
5. The required dwell time for stripping will depend upon the ambient temperature, humidity, and thickness of LBP. If LBP is not completely removed following the initial application of stripper, a second application and wet scraping may be required.
6. Removed LBP shall not be deposited on the polyethylene containment surfaces but shall be transferred directly into 6-mil polyethylene bags from the scraper. LBP shall be removed by wet scraping to the maximum extent feasible.
7. Any residue not removable by wet scraping shall be washed down to the bare metal substrate with a high-phosphate solution. LBP-contaminated wastewater shall be kept to a minimum using wet scrub brushes or sponges. These residues and disposable cleaning media shall also be directly transferred to the 6-mil polyethylene bags containing other LBP wastes. Free standing water shall be eliminated by use of a drying agent.
8. Clearance will be performed as follows:
  - a. Visual Clearance - Determine that all required work has been completed. Look for settled dust, paint chips or debris in work area. If located, cleanings will commence until visual inspection locates no evidence of dust.
  - b. The Owner's Consultant shall perform Dust and/or Soil Sampling as outlined in the U.S. Department of Housing and Urban Development "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing".

C. Manual Demolition/Scraping/Cleaning: Assumed Exposure ( $50 \text{ ug/m}^3$  -  $500 \text{ ug/m}^3$ )



Manual demolition, scraping, manual sanding and power tool cleaning with dust collection systems shall be performed in conjunction with engineering and work practice controls meeting the requirements of 29 CFR 1926.62(e)(1).

Seal openings of HVAC ductwork and other penetrations (doors, windows, etc.) within the Control Area with two layers of 6-mil polyethylene sheeting. For work on vertical surfaces, place a layer of 6-mil polyethylene sheeting below the area prior to manual demolition/scraping/ cleaning. The sheeting shall extend 5 ft. on either side of the work area, to catch any paint chips that may become dislodged.

Wet methods shall be used during manual scraping, manual sanding and power tool cleaning with dust collection systems. Local HEPA ventilation shall be utilized in conjunction with manual scraping, manual sanding and power tool cleaning with dust collection systems. In the case that local HEPA ventilation is not sufficient to control dust hazards, the Contractor shall be required to install engineering controls to meet requirements of Specification Section 1.8(D) "Negative Air Pressure System".

Removed LBP shall not be allowed to accumulate on surfaces within the Control Area, but shall be HEPA vacuumed or placed directly into 6-mil polyethylene bags. The Contractor shall maintain all surfaces as free as practicable of accumulated lead dust to prevent the dispersal of lead into the work place. LBP shall be removed by manual methods to the maximum extent feasible.

Debris shall be bagged in 6-mil polyethylene bags and secured in leak proof drums until TCLP testing is completed. Follow proper disposal requirements. The area around the surfaces subject to work shall be wet wiped and HEPA vacuumed, including the polyethylene sheeting. Upon clearance by the Owner's Consultant, the polyethylene sheeting shall be carefully folded in on itself and placed in a 6mil disposal bag. Containment debris shall be properly disposed of as lead-based waste.

Clearance will be performed as follows and as needed:

- a. Visual Clearance – determine that all required work has been completed. Look for settled dust, paint chips or debris in work area. If located, cleanings will commence until visual inspection locates no evidence of dust.
- b. The Owner's Consultant shall perform Dust and/or Soil Sampling as outlined in the U.S. Department of Housing and Urban Development "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing".

#### D. Alternative Lead Work Procedures

1. Any Work Procedure other than the outline procedures above, shall be submitted to the Owner's Consultant for approval prior to the start of the project. As there are many different components in differing areas of the building(s), it is impractical to address every potential lead work procedure. The intent of alternative lead work procedures shall be to maintain compliance with 29 CFR 1926.62 and maintain airborne concentrations of lead dust below the Action Level of 30 ug/dL of air.

### 3.3 MONITORING & CLEARANCE SAMPLING

During the entire LBP removal and disposal operations, the Owner's Consultant shall be on-site directing the monitoring/sampling and inspecting the work to ensure that the health and safety requirements of this contract are satisfied.



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- A. Personnel Air Monitoring (Provided by the Contractor, as necessary)
1. Personnel air monitoring samples for airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR Part 1926.62. Results shall be reported in micrograms per cubic meter of air. The Competent Person shall use personal air monitoring results to determine the effectiveness of engineering controls, the adequacy of PPE and to determine if proper work practices are being employed. The Owner's Consultant shall be notified if any personal air monitoring result equals or exceeds 30 micrograms per cubic meter of air. The Contractor shall take steps to reduce the concentration of lead in the air.
- B. Area Air Monitoring (Provided by the Owner's Consultant, as requested)
- Airborne concentrations of lead shall be collected and analyzed in the laboratory. Results shall be reported in micrograms per cubic meter of air.
1. Pre-LBP work  
Pre- LBP work samples shall be collected in the following locations: 1) inside the lead control area, one upwind of the LBP work and two downwind of the LBP work procedure activities; and 2) outside the physical boundary (roped off) area, one upwind of the LBP work and two downwind of the LBP work activities. A total of six (6) samples. If work is performed inside the building, similar numbers of samples are to be positioned inside and outside the LBP containment area.
  2. LBP Work  
The Competent Person shall collect area air samples on a daily basis during the duration of the LBP work. The samples shall be collected in the same location as the pre-work samples.
  3. The area air samples shall be collected at 4 to 6 feet above grade, and using high volume air samplers.
  4. The air samples shall be analyzed by NIOSH Method 7082 or method approved by Engineer.
  5. Results  
The Contractor shall have the results of the area air monitoring within 24 hours after completion of the sampling. Results shall be reported in micrograms per cubic meter of air.
  6. Excessive Levels  
Outdoor LBP work shall cease and the Owner's Consultant notified if measured airborne lead concentrations, collected during LBP activities, exceed the pre-work airborne concentration levels. The Contractor may be required to clean and re-sample the affected area, at no additional cost to the Owner, if directed by the Owner's Consultant. The Contractor shall correct the work practices and/or engineering controls and shall resume LBP work procedures at the direction of the Owner's Consultant.
- C. Waste Sampling and Testing (Provided by the Contractor)
- Sampling and testing of all waste, shall be in accordance with 40 CFR Part 261, 6 NYCRR Part 371 and SW-846, Chapter 9, Sampling Plan. See Paragraph 3.5.C of this specification section for waste sampling and analyses requirements.
- D. Soil Sampling (Provided by the Owner, as requested)
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1. If the Owner's Consultant or Owner's representative observes paint chips or LBP debris on the surface of the soil surrounding the work area during the LBP work procedures or at completion or if the Owner's Consultant or IH/ Owner's Representative suspects potential contamination to the soil based on observed procedures and conditions during the work, the contractor shall pay for composite soil samples of the surface soil where designated by the Owner's Consultant and at a frequency specified by the Owner's Consultant. Two Background surface soil samples will be collected where directed by the Owner's Consultant. The samples shall be analyzed by an independent laboratory for lead on a total basis (by EPA Method 6010) and TCLP basis (Extraction Method 1311, analysis by EPA Method 6010).
2. Standard Soils Clearance samples shall be collected by the Owner's Consultant and paid for by the Owner. The samples shall be analyzed by an independent laboratory for lead on a total basis (by EPA Method 6010) and TCLP basis (Extraction Method 1311, analysis by EPA Method 6010).
3. If the analyses exceed the TCLP limit, the soil shall be treated as LBP contaminated waste, excavated and disposed of as a hazardous waste by the Contractor.

Clearance Level:

Soil: 400 microgram per gram

E. Dust/Wipe Sampling (Provided by the Owner, as necessary)

1. Dust/wipe samples shall be taken no sooner than 24 hours after abatement activities, including clean-up activities, have been completed.
2. Sampling for clearance criteria shall be performed as detailed in the HUD Guidance document. Appendices 13 and 14.
3. Failure to clear the work area and recleaning shall be the responsibility of the Contractor. The work area shall remain in place until satisfactory clearance has been achieved.
4. Analysis of Dust/Wipe samples for areas, which failed previous Dust/Wipe sampling, shall be reimbursed by the Contractor.

Clearance Levels:

Floors: 10 micrograms per square foot  
Window Sills: 100 micrograms per square foot  
Window Wells: 400 micrograms per square foot

### 3.4 ADJACENT AREAS

Damage to adjacent areas shall be repaired to the approval of the Owner.



### 3.5 CLEAN-UP & DISPOSAL

#### A. Cleanup

1. **Daily**  
Surfaces in the LBP control area shall be maintained free of accumulations of paint chips, LBP debris, blasting debris and dust. Spread of dust and debris shall be restricted; waste shall not be distributed over the work area. Dry sweep or compressed air shall not be used for cleanup. At the end of each shift, the area shall be cleaned of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet wiping the area. LBP work procedures work shall cease during the cleanup.
2. At Completion of LBP work Procedure and a satisfactory visual inspection by the Engineer, a clean-up shall be performed by the Contractor. This clean-up includes removal of any contaminated material, equipment or debris including polyethylene sheeting from the work area. The polyethylene sheeting shall be sprayed or misted with water for dust control, construction debris removed and then the sheeting removed by folding it in upon itself.
  - a. Lead-contaminated debris shall be containerized in accordance with paragraph 3.5.C.1, LBP Wastes and Lead-Contaminated Wastes. Waste bags shall not be overloaded, shall be securely sealed and stored in the designated area until disposal.
  - b. Removal of surface polyethylene sheeting shall begin from top to bottom. Removal of floor polyethylene sheeting shall begin at the corners and folded in the middle to contain the dust. Polyethylene shall be disposed of as specified in Paragraph 3.5.C.1
  - c. **Cleaning Equipment.** The Contractor shall decontaminate the lead abatement equipment and equipment used in the work area. The wastewater from cleaning shall be contained, sampled and disposed of as specified in Paragraph 3.5.C.2.

#### B. Certification

The Contractor shall certify in writing that the inside and outside the lead control area air monitoring samples are less than 30 micrograms per cubic meter of air, the respiratory protection for the employees was adequate, the work procedures were performed in accordance with 29 CFR Part 1926.62 and that there was no visible accumulations of lead-based paint and dust on the worksite. Do not remove warning signs at the lead control area or roped-off boundary signs prior to the Owner's Consultant's receipt of the Contractor's certification. Re-clean areas showing dust, residual paint chips. LBP debris and blasting debris.

Waste Storage, Sampling/Analysis and Disposal (Provided by the Contractor)

#### 1. LBP Wastes and Lead-Contaminated Water

LBP waste, and lead-contaminated waste and debris shall be stored sampled and analyzed and disposed of as follows.

- a. The LBP waste and debris, lead contaminated personal protective equipment (PPE), clothing and waste polyethylene and lead-contaminated waste and debris shall be containerized in DOT approved containers (i.e.. 55 gallon drums, roll-off, etc.). If the waste is placed in roll-off(s), the roll off shall be lined with a minimum of 2 layers of 6-il polyethylene prior to placing any waste in it and covered with a liquid tight cover. Each container shall be labeled to identify the type of waste as



defined in 49 CFR Part 172, 6 NYCRR Part 371 and 6 NYCRR Part 360 and with the date lead contaminated wastes were first put into the container.

- b. A representative sample of the container(s) of LBP wastes and lead-contaminated wastes and debris generated by the LBP activities shall be taken in accordance with SW-846, Chapter 9, Sampling Plan and analyzed in the laboratory for TCLP lead by EPA Methods 1311 (extraction) and 6010 (analysis). If the wastes are placed in roll-off(s), four (4) composite samples per roll-off shall be taken for analysis. If the wastes are placed in 55 gallon drums, one composite sample for every ten (10) drums of wastes shall be taken for analysis. The laboratory analyses results shall dictate the proper method of disposal of the waste. A copy of the results shall be attached to the waste characterization (waste profile) form.
- c. A waste characterization (waste profile) form shall be completed for the LBP waste and lead-contaminated waste and debris, and lead contaminated personal protective equipment and clothing (if containerized separately) and the forms submitted to Owner's Consultant for approval. The Owner shall sign the forms. The Contractor shall process the forms and forward to the disposal facility for approval. The approved waste profile forms from the disposal facility shall be submitted to the Owner and Engineer prior to shipment of the wastes off-site.
- d. The applicable waste transportation and disposal documents (i.e., hazardous waste manifest, bill of lading, non-hazardous waste manifest, land disposal restriction notification, etc.) shall be obtained and completed. An example of the completed waste transportation and disposal documents shall be submitted to Owner's Consultant for approval prior to shipment of the waste off-site.
- e. Pick-up of hazardous wastes shall be made as needed to ensure that containers do not remain on the work site longer than 90 calendar days from the date affixed to each container. The Owner will assign an area for interim storage of waste-containing containers.
- f. Lead contaminated personal protective equipment/ clothing, lead contaminated polyethylene, filters and debris, which cannot be sampled, shall be handled, stored, transported, and disposed of in the same manner as the LBP wastes and lead-contaminated wastes and debris, based on the sampling, laboratory analyses results and SW-846, Chapter 9, Sampling Plan calculations performed on the LBP wastes and lead-contaminated wastes and debris.
- g. The LBP and lead contaminated wastes/ debris shall be handled, stored, transported and disposed of in accordance with 40 CFR Parts 260 to 265, 6 NYCRR Part 370 to 373, 6 NYCRR Part 364 and 6 NYCRR Part 360, as applicable. Additionally, the disposal shall be based on the sampling, laboratory analysis results and SW-846, Chapter 9, Sampling Plan calculations. Land disposal restriction notification shall be as required by 40 CFR Part 268 and 6 NYCRR Part 376.

## 2. Wastewater and Decontamination Water

- a. Lead contaminated wastewater and decontamination water generated from the LBP work procedures shall be stored in DOT approved 55 gallon drums. Each drum shall be labeled to identify the type of waste as defined by 49 CFR Part 172, 6 NYCRR Part 371 and 6 NYCRR Part 360 and with the date lead contaminated liquid was first put into the drum.



- b. A representative sample from the drum(s) of liquid wastes shall be taken in accordance with SW-846, Chapter 9, Sampling Plan and analyzed in the laboratory for total lead and total cadmium by EPA Method 200.7/6010. One composite sample for every ten (10) drums of liquid wastes shall be taken for analysis. The laboratory analyses results shall dictate the proper method of disposal of the waste. A copy of the results shall be attached to the waste characterization (waste profile) form.
- c. A waste characterization (waste profile) form shall be completed for the liquid wastes and other wastes being generated and submitted to Owner's Consultant for approval. The Owner shall sign the form(s). The Contractor shall process the form(s) and forward the forms to the disposal facility for approval. The approved waste profile form(s) from the disposal facility shall be submitted to the Owner and Engineer prior to shipment of the wastes off-site.
- d. The applicable waste transportation and disposal documents (i.e., hazardous waste manifest, bill of lading, non-hazardous waste manifest, land disposal restriction notification, etc.) shall be obtained and completed. An example of the completed waste transportation and disposal documents shall be submitted to Owner's Consultant for approval prior to shipment of the waste off-site.
- e. The lead contaminated wastewater and decontamination water shall be handled, stored, transported and disposed of in accordance with 40 CFR Parts 260 to 265, 6 NYCRR Part 370 to 373, 6 NYCRR Part 364 and 6 NYCRR Part 360 as applicable.

### 3. Waste Pick-Up and Disposal

- a. Waste pick-up cannot be performed until all required submittals have been reviewed and approved by the Owner's Consultant. The Owner must be present at waste pick-up to sign the waste transportation documents and approve pick-up. No waste shall leave the site without approval and authorization by Owner.
- b. Coordinate scheduling of waste pick-up and transportation with Owner's Consultant. Notify Engineer at least 48 hours ahead of when the waste pick-up will take place.
- c. All wastes shall be properly disposed of off-site at an approved disposal facility. The wastes shall be transported by a transporter permitted to transport wastes per 6 NYCRR Part 364. The wastes shall be disposed of at a facility permitted to accept the waste being disposed of.
- d. Submit copy of completed and signed transportation and disposal documents to Owner and Engineer at time of shipment and submit copy of document signed by the disposal facility.
- e. Return or cause to be returned all waste manifests and bills of lading signed by the disposal facility within fifteen (15) days of removal from the project site.
- f. Submit certification of destruction for all incinerated wastes and certificates of final treatment and/or final disposal, as applicable, for all wastes disposed of off-site.



- g. All waste transportation and disposal must be conducted in accordance with all applicable State, Local and Federal regulations, all generator State regulations, all the State regulations where the wastes are transported through, and the disposal State regulations.

C. Payment for Disposal of Wastes

Payment for disposal of wastes will not be made until the following are received by the Owner:

1. A signed copy of the manifests
2. Bills of lading
3. Weight tickets, etc.
4. Certificate of final disposal, from the final treatment or disposal facility certifying the amount of lead containing wastes and debris delivered.

## **PART 4 – INSPECTION**

### **4.1 SUMMARY OF INSPECTION**

Limited lead-based paint inspections were completed throughout specific Renovation Areas as detailed on CPL architectural drawings to identify suspect lead-based paints and/or lead-containing hazards potentially affected by scheduled demolition/renovation activities included within the ***Poughkeepsie CSD: 2020 Capital Improvement Project – Phase 1B Building Improvements*** as detailed within Section #1.2 of this specification.

Inspection was completed by Niton-certified XRF Technician & EPA Lead Inspector Mr. Nicholas Salerno of **QuES&T**. Existing documentation and/or information attained within prior inspections and/or sampling activities were reviewed and incorporated into this specification.

Paint testing was completed on-site utilizing a Niton XLp-300A XRF Spectrum Analyzer Serial # 102273 in accordance with the EPA issued Performance Characteristics Sheet (PCS). A summary of results above the EPA action level of 1.0 mg/sq. cm., has been included to aid prospective bidders.

Survey was completed in accordance with EPA, OSHA and/or HUD Guidelines for inspection of lead-based paint(s) and/or lead-containing material(s). Per these protocols, all suspect coated surfaces impacted by demolition/renovation activities were located and categorized by homogeneous painting histories and component types.

### **4.2 SUMMARY OF RESULTS ABOVE THE EPA ACTION LEVEL OF 1.0 mg/cm<sup>2</sup>**

The following is a detailed listing of identified Lead-based Paint(s) and/or Lead-containing Materials, above the EPA action level of 1.0 mg/sq. cm. The following listing should be utilized as a guide to specific work-related tasks and is not necessarily an Abatement Scope. Specified lead-safe work practices shall be performed in accordance with the stipulations defined within this specification as required by specific work-related tasks and in advance of disturbance(s) of the following Lead-based Paint(s) and/or Lead-containing Material(s), above the EPA action level of 1.0 mg/sq. cm:



**TABLE I: IDENTIFIED LEAD-BASED PAINT**  
**POUGHKEEPSIE CSD**  
**2020 CAPITAL IMPROVEMENT PROJECT**  
**PHASE 1B: BUILDING IMPROVEMENTS**  
**(CONSTRUCTION AREAS)**

Location	LBP Component	Substrate	Color	LBP Condition
<b>Poughkeepsie High School</b>				
Girl's Bathroom T-21	Wall Tile	Ceramic	Pink	Good
Girl's Bathroom T-1	Wall Tile	Ceramic	Pink	Good
Boy's Locker Room Office	Cove Base	Vinyl	Grey	Good
Nurse's Office Bathroom	Cove Base	Ceramic	Yellow	Good
Assistant Principal's NE Women's Bathroom	Cove Base	Vinyl	Black	Good
Assistant Principal's NE Women's Bathroom	Toilet	Ceramic	White	Good
Assistant Principal's NE Women's Bathroom	Sink	Ceramic	White	Good
<b>Poughkeepsie Middle School</b>				
Gym Men's Bathroom	Urinal	Ceramic	White	Good
Admin. Hallway Bathroom	Toilet	Ceramic	White	Good
Boy's Bathroom 128	Urinal	Ceramic	White	Good
Boy's Bathroom 165	Urinal	Ceramic	White	Good
Boy's Bathroom 215	Urinal	Ceramic	White	Good (5) Damaged (1)
Boy's Bathroom 246	Urinal	Ceramic	White	Good
Boy's Bathroom 316	Urinal	Ceramic	White	Good
Boy's Bathroom 343	Urinal	Ceramic	White	Good
Girl's Bathroom B65	Sink	Ceramic	White	Good
Boy's Bathroom B66	Urinal	Ceramic	White	Good
Boiler Room	Slop Sink	Ceramic	Black	Good
<b>Clinton Elementary School</b>				
Girl's Bathroom 120	Sink	Ceramic	White	Good
Girl's Bathroom 120	Radiator Cove Base (6")	Vinyl	Black	Good
Throughout Custodial Closets	Slop Sink	Ceramic	White	Good



Boy's Bathroom 104	Sink	Ceramic	White	Good
Girl's Bathroom 016	Sink	Ceramic	White	Good
Girl's Bathroom 211	Radiator Cove Base (6")	Vinyl	Black	Good
Boy's Bathroom 204	Sink	Ceramic	White	Good
Boy's Bathroom 204	Toilet	Ceramic	White	Good
<b>Warring Elementary School</b>				
Custodial Closets Throughout Building	Slop Sink	Ceramic	White	Good
Bathroom 208	Pipe	Metal	White	Good
Boy's Bathroom 124	Toilet	Ceramic	White	Good
Girl's Bathroom 123	Toilet	Ceramic	White	Good
Custodial Closet 125	Drain Pipe	Metal	Grey/Beige	Good
Bathroom 109	Pipe	Metal	White	Good
Boy's Bathroom 022	Cove Base	Ceramic	Light Blue	Good
Boy's Bathroom 022	Window Casing	Wood	Light Blue	Good
<b>George W. Krieger Elementary School</b>				
Throughout Gang Bathrooms	Lower Wall	Plaster	Green	Good
Throughout Custodial Closets	Wall	Plaster		Good
Throughout Custodial Closets	Pipe	Metal		Good
Girl's Bathroom 106	Toilet	Ceramic	White	Good
Bathroom 112 Sides A, B, C, D	Wall Tile	Ceramic	Green	Good
Bathroom 112 Side C	Sink	Ceramic	White	Good
Boy's Bathroom 137	Toilet	Ceramic	White	Good
Girl's Bathroom 204	Toilet	Ceramic	White	Good
<b>Morse Elementary School</b>				
Bathroom 8-6A	Cove Base	Vinyl	Black	Good
Bathroom 8-6A	Toilet	Ceramic	White	Good
Bathroom 8-6A	Sink	Ceramic	White	Good
Bathroom 8-2A	Cove Base	Vinyl	Black	Good



Bathroom 8-2A	Sink	Ceramic	White	Good
Bathroom 8-2A	Toilet	Ceramic	White	Good
Throughout Custodial Closets	Slop Sink	Ceramic	White	Good
Throughout Gang Bathrooms	Wall	Plaster		Good
Teacher's Conference Room Bathroom	Wall Tile	Ceramic	Light Blue	Good
Teacher's Conference Room Bathroom	Sink	Ceramic	White	Good
<b>Smith Early Learning Center</b>				
Gym Boy's Bathroom	Cove Base	Ceramic	Light Blue	Good
Classroom 101 Bathroom Sides B, C, D	Wall	Brick	Light Blue	Good
<b>Columbus Elementary School</b>				
Basement Women's Bathroom	Cove Base	Ceramic	White	Good
Basement Women's Bathroom	Wall/Ceiling	Plaster	Beige	Good
Basement Women's Bathroom	Ductwork	Metal	Beige	Good
Basement Women's Bathroom	Sink	Ceramic	White	Good
Basement Men's Bathroom	Cove Base	Ceramic	White	Good
Basement Men's Bathroom	Wall/Ceiling	Plaster	Blue/White	Good
Basement Men's Bathroom	Urinal	Ceramic	White	Good
Basement Men's Bathroom	Sink	Ceramic	White	Good
Women's Bathroom 114	Wall	Ceramic	Beige	Good
Women's Bathroom 114	Ceiling	Plaster	Beige	Good
Women's Bathroom 114	Window Sill	Wood	Beige	Good
Women's Bathroom 114	Sink	Ceramic	White	Good
Men's Bathroom 118	Wall	Ceramic	White	Good
Men's Bathroom 118	Wall/Ceiling	Plaster	Beige	Poor
Men's Bathroom 118	Window Sill/Casing	Wood	Beige	Good
Men's Bathroom 118	Sink	Ceramic	White	Good
Men's Bathroom 118	Urinal	Ceramic	White	Good
Men's Bathroom 118	Slop Sink	Ceramic	White	Good



Women's Bathroom 204	Stall Door	Wood	White	Good
Women's Bathroom 204	Wall Hatch	Wood	Beige	Good
Women's Bathroom 204	Window Sill	Wood	Beige	Good
Women's Bathroom 204	Wall/Ceiling	Plaster	Beige	Good
Women's Bathroom 204	Sink	Ceramic	White	Good
Men's Bathroom 227	Slop Sink	Plaster	Beige	Poor
Men's Bathroom 227	Window Sill/Casing	Wood	Beige	Good
Men's Bathroom 227	Sink	Ceramic	White	Good

**END OF SECTION 02 8300**



**SECTION 03 2000  
CONCRETE REINFORCEMENT**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Work covered by this Section includes the furnishing and installation of concrete and masonry reinforcement as specified in the Contract Documents.

**SUBMITTALS**

- A. Manufacturer's certification that reinforcement meets Specification requirements, and/or certified mill test reports
- B. Shop Drawings shall show dimensions, spacing, bar and mesh schedule, bending details, stirrup and support details, and other pertinent data and in accordance with ACI 315.
- C. Provide copy of all approved shop drawings to Special Inspector.
- D. **QUALITY ASSURANCE**
- E. Provide at least one person who will be present during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed, the referenced standards and the requirements of this work, and who shall direct all work performed under this section.
- F. Work shall comply with requirements and recommendations of the following:
  - 1. American Concrete Institute, ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures."
  - 2. American Concrete Institute, ACI 318, "Building Code Requirements for Reinforced Concrete Structures."
  - 3. American Concrete Institute, ACI-ASCE 530 and 530.1, "Building Code Requirements for Masonry Structures."
  - 4. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
  - 5. American Concrete Institute, ACI SP-66 "Detailing Manual."
- G. **DELIVERY, STORAGE, AND HANDLING**
- H. All deliveries shall be accompanied by detailed bills of material which shall include information pertaining to bar size, bar mark, length of bends, total length of bar, weight of individual sets of bars and total weight delivered for each structure. Bundles shall be color coded.
- I. Store reinforcement off the ground, under suitable cover or in a suitable enclosure. Maintain easy access for inspection and identification of materials.
- J. Maintain reinforcement free from dirt, grease, scale, loose rust, oil, paint, other foreign matter, and all deleterious materials. Clean all reinforcement as required to meet these conditions, and maintain such clean condition until such time as concrete is placed.

**JOB CONDITIONS**

- A. All reinforcing steel within the limits of a day's pour shall be in place and firmly wired prior to commencement of concrete placing operations.
  - B. Placing or wiring of steel less than six hours before concreting starts shall not be permitted except by special written authorization of the Owner's Representative. At least six hours of review time for each pour location shall be provided to the Special Inspector by the Contractor after the last reinforcement is placed and prior to placement of concrete.
  - C. The reinforcing steel, in place, shall be subject to review and approval by the Special Inspector prior to placing of any concrete.
  - D. The Contractor shall notify the Owner's Representative and Special Inspector a minimum of at least 24 hours prior to readiness for each reinforcing review.
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## **PART 2 - PRODUCTS AND MATERIALS**

### **4.01 MATERIALS**

- A. Reinforcing Bars: Deformed bars conforming to ASTM A615, Grade 60, including Supplementary Requirement S1.
- B. Wire Fabric Plain Type: ASTM A185. Flat sheets only.
- C. Wire Fabric Deformed Type: ASTM A497.
- D. Tie Wire: 16 gauge annealed type.
- E. Supporting Devices: Size and shape appropriate to conditions. Where concrete is exposed to view, chairs shall have plastic coated feet.
- F. Supporting devices for slabs on grade shall have sand plates.
- G. Dowels: plain round bars conforming to ASTM A675 Grade 80.
- H. Adhesive anchors shall be equal to HILTI HVA adhesive system as manufactured by HILTI Corp. of Tulsa Ok. (1-800-879-8000).
- I. Pipe Sleeves: Standard weight pipe conforming to ASTM A120.

### **FABRICATION**

- A. Fabricate reinforcement in accordance with CRSI Manual of Standard Practice, ACI SP-66 and ACI 318.
- B. Accurately fabricate to the details and dimensions shown on the Drawings.
- C. All bars shall be bent cold and shall not be bent or straightened in a manner which will injure the material (i.e. torched).
- D. Bend all reinforcement in accordance with ACI 318.
- E. No bars partially embedded in concrete shall be field bent except as shown on the Drawings or as permitted by Architect/Engineer.

## **PART 3 - EXECUTION**

### **6.01 INSTALLATION**

- A. Accurately position reinforcement and firmly support in place. The system of holding reinforcement in place shall insure that steel will not be able to move during concrete placement. If necessary, top reinforcing shall be adequately held in position to support the weight of the workmen without displacement. All reinforcement shall be rigidly wired in place with adequate spacers and tie chairs. Bar supports shall be 3'-0" on center maximum, and in accordance with ACI 315.
  - B. For concrete slabs on ground or fill, support reinforcement on approved chairs. "Hooking-up" or "Walking-in" of any reinforcement including mesh, will not be permitted.
  - C. Protective concrete cover shown on the Contract Documents, or required by ACI Code, shall be rigidly adhered to. Coordinate conduit and insert placement so as to avoid decreasing or increasing protective cover on reinforcement.
  - D. In the event conduits, piping, inserts, sleeves, or any other items interfere with the placing of reinforcement, as indicated on the Contract Documents, consult Owner's Representative for required changes.
  - E. Protect installed reinforcing from damage and displacement before, during, and after placement of concrete. Exposed reinforcing intended for bonding with future extensions shall be protected from corrosion.
  - F. At the time concrete is placed, all reinforcement shall be free from dirt, mud, ice, rust, scale, loose mill scale, oil, paint, and other coatings which may destroy or reduce bond between steel and concrete.
  - G. The Contractor shall repair or replace damaged, distorted or displaced reinforcement.
-



**SPLICES IN REINFORCEMENT**

1. Lap splices (wired together) and embedment lengths shall conform to:

**CONCRETE - ACI 318 - CHAPTER 12**

**MASONRY - ACI 530 - CHAPTER 8**

- A. No splices of reinforcement shall be made except as shown on the plans or as specified/authorized by the Owner's Representative.
- B. Welding of reinforcing is not permitted unless specified or authorized by the Owner's Representative.

**END OF SECTION**



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**SECTION 03 3000  
CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Formwork for cast-in-place concrete, including all openings shown or not shown on structural drawings.
- B. Cast-in-place concrete, including concrete for the following, and other items as indicated on the Drawings.
  - 1. Foundation walls, piers, footings, mats.
  - 2. Floors and slabs on grade.
  - 3. Exterior slabs and walks.
  - 4. Equipment pads and bases.
  - 5. Other items as indicated.
- C. Concrete curing and finishing.
- D. Control joints, expansion, and contraction joints.
- E. Concrete testing.

**SUBMITTALS**

**PROVIDE COPY OF ALL APPROVED SHOP DRAWINGS TO SPECIAL INSPECTOR.**

- A. Submit manufacturer's catalog cuts, technical data, and recommendations on quantities, installation, and application for the following:
    - 1. Formwork accessories.
    - 2. Concrete admixtures.
    - 3. Waterstops.
    - 4. Grout and patching materials.
    - 5. Bonding agents.
    - 6. Anchor bolts and inserts.
    - 7. Joint fillers.
    - 8. Vapor barrier.
    - 9. Curing and sealing compounds.
      - a. Control Joint Layout.
      - b. Frames.
      - c. Sleeves.
      - d. Insert Plates.
  - B. Submit proposed mix designs and test data. Identify for each mix submitted the method by which proportions have been selected.
    - 1. For mix designs based on field experience, include individual strength test results, standard deviation, and required average compressive strength  $f'(cr)$  calculations.
    - 2. For mix designs based on trial mixtures, include trial mix proportions, test results, and graphical analysis and show required average compressive strength  $f'(cr)$ .
    - 3. Indicate quantity of each ingredient per cubic yard of concrete.
    - 4. Indicate type and quantity of admixtures proposed or required.
    - 5. Submit current test reports for aggregates showing compliance with specified quality and gradation.
    - 6. Submit current test reports for cement.
  - C. Submit affidavits from an independent testing agency certifying that materials furnished under this section conform to Specifications.
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- D. Provide documentation from manufacturers assuring compatibility of admixtures with other ingredients. Provide documentation from manufacturers assuring compatibility of all surface applied products (mastic, tile, VCT, carpet, etc).
  - E. Submit concrete placement schedule prior to start of any concrete placement operations. Include location of all joints as indicated on the Drawings or in the specification, plus anticipated construction joints.
  - F. Submit copies of delivery tickets complying with ASTM C 94 for each load of concrete delivered to site. Include on the tickets the additional information specified in the ASTM document.
  - G. Submit description of planned protective measures for cold weather or hot weather concreting.
  - H. QUALITY ASSURANCE
  - I. The American Concrete Institute (ACI), ACI 318 "Building Code Requirements for Reinforced Concrete" and ACI 301 "Specifications for Structural Concrete for Buildings" shall be part of these Specifications as though written and attached hereto.
  - J. Work shall comply with recommendations and requirements of the following, except as specifically superseded by these Specifications:
    - 1. ACI 211 "Selecting Proportions for Concrete";
    - 2. ACI 308 "Curing Concrete";
    - 3. ACI 304 "Measuring, Mixing, Transporting and Placing Concrete";
    - 4. ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures";
    - 5. ACI 302 "Floor and Slab Construction";
    - 6. ACI 305 "Hot Weather Concreting";
    - 7. ACI 306 "Cold Weather Concreting";
    - 8. ACI 347 "Formwork for Concrete"; and
    - 9. ACI 330
  - K. Provide at least one person who shall be present during the execution of this portion of the Work and who shall be thoroughly trained and experienced in placing the types of concrete specified and who shall direct work performed under this Section.
  - L. Concrete topping shall be placed under the direct supervision of the precast plank manufacturer.
  - M. Contractor shall assemble representatives of the concrete supplier, suppliers of admixtures or products used, the finisher, and the Owner's Representative to be present during the placement and finishing operation.
  - N. Contractor shall arrange a pre job meeting including the concrete supplier, manufacturer's representatives, concrete finisher, Special Inspector and Architect to review mix design and placement and curing techniques.
  - O. Concrete Quality Control
    - 1. Procure concrete from a single Engineer-approved source. Source shall be a central commercial batching plant conforming to "Concrete Plant Standards" of the Concrete Manufacturer's Association - automatic proportioning type.
    - 2. Conform to ASTM C94, paragraphs 1 through 15 and paragraph 18.
    - 3. Obtain materials of each type from same source for the entire project.
    - 4. The Owner shall engage testing agency to conduct tests and perform other services specified for quality control during construction. See Section 01450 – Special Inspector.
  - P. Project Conditions
    - 1. Notify Owner's Representative at least 48 hours in advance of intent to place concrete.
    - 2. Do not place concrete when the ambient temperature is below 400F nor when the concrete temperature or ambient temperature exceeds 850F. The Architect may approve the placement of concrete under the above conditions, provided the recommendations of ACI 305 or ACI 306 are strictly adhered to.
-



3. Do not place concrete when environmental conditions may adversely affect the placing, finishing, or curing of concrete, or its strength.
- Q. The Contractor is responsible for correction of concrete work which does not conform to the specified requirements, including strength, tolerances, and finishes. The Contractor shall correct deficient concrete as directed by the Owner's Representative.
- R. The Contractor is responsible for the design of any formwork and shoring required.

## **PART 2 - PRODUCTS AND MATERIALS**

### **4.01 FORMWORK**

- A. Form Materials:
  1. Concrete not exposed to view: Any standard form materials that shall produce structurally sound concrete.
  2. Exposed finish concrete: Materials selected to offer optimum smooth, stain-free final appearance and minimum number of joints. Material shall resist hydrostatic head without bowing or deflection.
  3. Plywood: PS-1, B-B high density concrete form overlay, Class I.
    - a. Provide 1/2" chamfers at all exposed corners.
    - b. Provided a tooled edge at brick ledges that are above grade.
- B. Formwork Accessories:
  1. Form coating: Form release agent that will not adversely affect concrete surfaces or prevent subsequent application of concrete coatings.
  2. Form ties: Commercially manufactured types; cone snap ties, taper removable bolt, or other type which will leave no metal closer than 1-1/2 inches from surface of concrete when forms are removed, leaving not more than a 1-inch-diameter hole in concrete surface.
- C. CONCRETE MATERIALS
- D. Portland Cement: ASTM C 150, Type II for normal weight concrete.
- E. Fly Ash: ASTM C618, Type F, Tables 1, 2, 3, and 4.
- F. Water: Fresh, clean, and potable.
- G. Aggregates:
  1. Normal weight concrete: ASTM C 33.
  2. Aggregate for normal weight concrete for interior slabs on grade shall conform to New York State DOT specification 703-0202 for Crushed Gravel.
  3. Fine aggregate: percentage passing No. 200 sieve shall be less than 3%.
  4. Coarse aggregate: Percentage passing No. 200 sieve shall be less than 0.7%.
    - a. Nominal size 1 1/2": ASTM Size No. 467
    - b. Nominal size 1": ASTM Size No. 57
    - c. Nominal size 1/2": ASTM Size No. 7
  5. Aggregates shall have been tested within the past six months from the date of the contract for the following:
    - a. Gradation: ASTM C136
    - b. Material finer than 200 sieve: ASTM C117
    - c. Organic impurities: ASTM C40
    - d. Soundness: ASTM C88
    - e. Clay lumps: ASTM C142
    - f. Light weight constituents: ASTM C123
    - g. Abrasive of coarse materials: ASTM C131
    - h. Soft particles: ASTM C235
    - i. Resistance to freeze-thaw: ASTM C66, ASTM C682.
- H. Admixtures



1. Admixtures which result in more than 0.1 percent of soluble chloride ions by weight of cement are prohibited.
2. Admixtures shall be certified by manufacturer for compatibility with other mix components.
- I. Air-Entraining Admixture: ASTM C 260. The following products or approved equivalents will be among those considered acceptable:
  1. "Air Mix"; The Euclid Chemical Company.
  2. "Micro-Air"; Master Builders, Inc.
  3. "Daravair"; W. R. Grace & Co.
- J. Water-Reducing Admixture: ASTM C 494, Type A. The following products or approved equivalents will be among those considered acceptable:
  1. WRDA with HYCOL; W.R. Grace & Co.
- K. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C 494, Type F or G. The following products or approved equivalents will be among those considered acceptable:
  1. "WRDA 19"; W.R. Grace & Co.
  2. "Daracem-100"; W. R. Grace & Co.
- L. Accelerator: Non-corrosive, non-chloride ASTM C494 Type C or E. The following products or approved equivalents will be among those considered acceptable:
- M. "Accelgard 80", Euclid Chemical Company.
- N. Waterproofing and Corrosion Protection Concrete Admixture: Provide inorganic complex alkaline earth silicate liquid admixture (IPANEX as manufactured by Cement Chemistry Systems, LP, or approved equivalent) in all concrete at the Salt Storage Shed. Install per manufacturer's written instructions.

#### **MISCELLANEOUS MATERIALS AND ACCESSORIES**

- A. Nonshrink Grout: CRD-C 621, Grade B. (ASTM C-1107). Provide nonmetallic type only. The following products or approved equivalents will be among those considered acceptable:
  1. "Masterflow 713 or 928"; Master Builders, Inc.
  2. "Euco N-S Grout"; The Euclid Chemical Company.
  3. "Axpandcrete"; Anti-Hydro Waterproofing Co.
  4. "Embeco 636"; Master Builders for equipment bases.
- B. Burlap: AASHTO M 182, Class 2 jute or kenaf cloth.
- C. Moisture-Retaining Cover: ASTM C 171, and as follows:
  1. Fibre reinforced waterproof paper.
  2. Polyethylene film.
  3. White burlap-polyethylene sheeting.
- D. Bonding Systems: ASTM C881; Type, grade, and class as required for project conditions. The following products or approved equivalents will be among those considered acceptable:
  1. "Concresive LPL", Master Builders, Inc.
  2. "Sikadur 32 Hi-Mod", Sika Corporation.
  3. "Euco #452 Epoxy System"; Euclid Chemical Company.
- E. Adhesive anchor system:
  1. Reinforcing bars:
    - a. "HIT RE 500 System", HILTI.
    - b. "Keligrout"; KELKEN GOLD, INC., Princeton, NJ (phone 800-342-5154)
  2. Anchor bolts:

#### **"HVA SYSTEM", HILTI.**

- a. "Kelibond Anchors", KELKEN GOLD, INC., Princeton, NY (phone 800-342-5154)



- B. Expansion Joint Filler for pavements and sidewalks: Nonextruding bituminous type conforming to ASTM D1751.
- C. Isolation joint filler for slabs on grade: Preformed cork, 1/2" thick, conforming to ASTM D1752, Type II.
- D. Preformed Control Joint: "Screed Cap" for joints to receive sealant; "Zip Cap-Control Joint" for sawcut type joints; as manufactured by Greenstreak, Inc.
- E. Waterstop: Polyvinyl chloride (PVC), ribbed type with center bulb. Size appropriate to application. Supply prefabricated corner shapes.
- F. Waterstop: Bentonite type, "Volclay Waterstop-Rx", as manufactured by American Colloid Company.
- G. Dovetail Anchor Slot: Galvanized steel, 22 gauge, felt filled.
- H. Expansion anchors as equivalent to HILTI Corp. of Tulsa, Oklahoma (800-879-8000) and size as noted on Drawings. (Wedge and sleeve anchors not interchangeable).
  - a. Wedge anchors: Used in concrete or grout filled concrete block.
  - b. Sleeve anchors: Used in hollow concrete block.
- I. Wedge anchors: Hohman & Barnard, size as noted on Drawings.

**UNDERSLAB VAPOR RETARDER: ASTM E96 AND AS FOLLOWS:**

- 1. Available Manufacturers: Subject to compliance requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 2. Stego Industries LLC
  - 3. Thickness: 15 mils
  - 4. Permeance Rating: Maximum 0.03 perms
  - 5. Applications: Under all concrete slabs on grade
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
- C. SURFACE APPLIED CURING AND SEALING COMPOUNDS
- D. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
  - 1. Master Builders, Inc.
  - 2. Anti Hydro Company, Inc.
  - 3. The Euclid Chemical Company.
  - 4. W. R. Meadows, Inc.
  - 5. Sonneborn Building Products Division/ChemRex, Inc.
  - 6. L & M Construction Chemicals, Inc.
- E. Curing and Sealing Compounds: For interior or exterior applications.
  - 1. Products shall comply with ASTM C 309, Type 1, clear styrene acrylate type, 30% minimum solids content.
  - 2. Maximum allowable moisture loss of 0.03 grams per square centimeter.
  - 3. Do not apply to surfaces scheduled to receive other finishes, coatings or coverings unless specifically approved by the Architect/Engineer.
  - 4. "SuperRez-Seal"; The Euclid Chemical Company or approved equivalent.
- F. Sealing and Hardening Compounds: Generally for use at exterior slabs and walks subject to deicing products.
  - 1. Concrete shall receive initial water cure as described elsewhere in this section.
  - 2. Product shall be siloxane based, 40% minimum solids content.
  - 3. "Euco-Guard VOX"; The Euclid Chemical Company or approved equivalent.
  - 4. Concrete Curing Compounds: Generally for interior curing applications.
  - 5. Product shall comply with ASTM C309, Type 1, Class B, wax free, resin based.



6. Maximum allowable moisture loss of 0.03 grams per square centimeter.
7. "KUREZ", The Euclid Chemical Company or approved equivalent. Do not apply to surfaces scheduled to receive other finishes, coatings, or coverings unless specifically approved by the Architect/Engineer.
8. For surfaces that are scheduled to receive other finishes, coatings, or coverings, use dissipating resin-type compound, "KUREZ-DR", The Euclid Chemical Company or approved equivalent.

G. Evaporation retarder: "Confilm"; Master Builders Company.

#### **CONCRETE MIX DESIGN**

- A. Do not begin concrete operations until proposed mixes have been reviewed and approved by the Engineer.
- B. Comply with recommendations of ACI 211.1 for normal weight concrete and ACI 211.2 for structural lightweight concrete.
- C. For each type and strength of concrete, establish the required average strength  $f'_{cr}$  of the design mix on the basis of either field experience or trial mixtures as specified in ACI 301, and proportion mixes accordingly. If trial mixtures method is used, employ an independent testing agency acceptable to the Engineer for preparing and reporting proposed mix designs.
- D. Verify air-dry unit weight of lightweight concrete in accordance with ASTM C 567, and correlate with fresh unit weight for use in acceptance of fresh concrete during construction.
- E. Admixtures:
  1. Air-entraining admixture: Add at rate to achieve specified air content.
  2. High-range water-reducing admixture (superplasticizer): Add as required for placement and workability.
  3. Do not use admixtures not specified or approved.
- F. Design mixes to meet or exceed each requirement specified. Where more than one criterion is specified, the most stringent shall apply. For example, a minimum cement content or maximum water-cement ratio might result in strengths greater than the minimum specified; likewise, a greater cement content or lower water-cement ratio may be required in order to achieve the required strength.
- G. Normal Weight Concrete - Type A
  1. Minimum compressive strength  $f'_c$ : 3,000 psi @ 28 days.
  2. Maximum water-cementitious ratio by weight: 0.50.
  3. Minimum cement content: 475 lbs. per cubic yard.
  4. Coarse aggregate size: 1".
  5. Maximum slump: 3-1/2 inches + 1 inch.
  6. Air Content: 4-6%.
  7. Schedule: Footings and non-retaining walls.
- H. Normal Weight Concrete - Type B
  1. Provide sufficient time for excess water to evaporate prior to placing floor coverings. See floor covering manufacturer.
  2. Minimum compressive strength  $f'_c$ : 3,000 psi @ 28 days.
  3. Maximum water-cementitious ratio by weight: 0.45.
  4. Minimum cement content: 540 lbs. per cubic yard.
  5. Coarse aggregate size: 3/4"-1".
  6. Maximum slump: 3-1/2 inches + 1 inch.
  7. Schedule: interior slabs on grade.
- I. Normal Weight Concrete - Type C
  1. Minimum compressive strength  $f'_c$ : 4,000 psi @ 28 days.
  2. Maximum water-cementitious ratio by weight: 0.45.



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3. Minimum cement content: 590 lbs. per cubic yard.
  4. Coarse aggregate size: 1/2"– 1 1/2".
  5. Maximum slump: 3-1/2 inches + 1 inch.
  6. Air Content: 4-6%.
  7. Schedule: exterior walks or paving: retaining walls.
- J. Normal Weight Concrete - Type D
1. Provide sufficient time for excess water to evaporate prior to placing floor coverings. See floor covering manufacturer.
  2. Minimum compressive strength  $f'_c$ : 4,000 psi @ 28 days.
  3. Maximum water-cementitious ratio by weight: 0.45.
  4. Minimum cement content: 590 lbs. per cubic yard.
  5. Coarse aggregate: 3/8 inch
  6. Maximum slump: 3-1/2 inches + 1 inch.
  7. Air Content: 4-6%.
  8. Schedule: topping for precast concrete plank , topping for stair pans .
- K. Light Weight Concrete
1. Minimum compressive strength  $f'_c$ : 3,500 psi @ 28 days.
  2. Minimum cement content: 660 lbs. per cubic yard.
  3. Coarse aggregate size: 3/4".
  4. Maximum slump: 2-1/2 inches + 1 inch.
  5. Air Content: 4-8%.
    - a. Schedule: Supported floors on composite steel deck.
- L. Provided that no additional expense to owner is involved, contractor may submit for Architect/Engineer approval requests for adjustment to approved concrete mixes when circumstances such as changed project conditions, weather, or unfavorable test results occur. Include laboratory test data substantiating specified properties with mix adjustment requests.
- M. Controlled Low Strength Material (CLSM) - Permanent: Material shall meet the requirements of ACI 229R with a compressive strength of 400 PSI.
- N. Controlled Low Strength Material (CLSM) - Removable: Material shall meet the requirements of ACI 229R with a compressive strength of 50- 100 PSI.
- O. CONTROL OF MIX IN THE FIELD
- P. A tolerance of up to 1 inch above specified slump will be permitted for 1 batch in 5 consecutive batches tested. Concrete of lower slump than that specified may be used, provided proper placing and consolidation is obtained.
- Q. If slump upon arrival at the site is lower than 1 inch below the value specified, one addition of water in accordance with ASTM C 94 will be permitted to bring slump within tolerance, provided that:
1. A positive means is available to measure the amount of water added at the site.
  2. The specified (or approved) maximum water-cementitious ratio is not exceeded.
  3. Not more than 45 minutes have elapsed since batching.
- R. Total Air Content: A tolerance of plus or minus 1-1/2 percent of that specified will be allowed for field measurements.
- S. Do not use batches that exceed tolerances. The Owner's Special Inspector has the authority to reject concrete.

#### CONCRETE MIXING

- A. Mix concrete materials in transit mixers, complying with requirements of ASTM C94, paragraphs 1 to 15 and 18 only.
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- B. Elapsed time between initial contact of the cement with water and the completed discharge of the batch at the project site shall not exceed 90 minutes or 300 revolutions of the drum, whichever comes first. These limits shall be reduced at the direction of the Owner's Representative.
- C. Concrete batch plant shall conform to requirements of the "Concrete Plant Standards" of the "Concrete Manufacturer's Association".

### **PART 3 - EXECUTION**

#### **10.01 HOT AND COLD WEATHER CONCRETING**

- A. Do not proceed with work of this section for hot or cold weather placement without approval of the Engineer.
- B. Comply with recommendations of ACI 306 when air temperatures are expected to drop below 40 degrees F either during concrete placement operations or before concrete has cured.
  - 1. Do not use frozen or ice-laden materials.
  - 2. Do not place concrete on frozen substrates.
  - 3. Do not add salt, calcium chloride, anti-freeze compounds.
- C. Comply with recommendations of ACI 305 when ambient temperature before, during, or after concrete placement is expected to exceed 85 degrees F.
  - 1. Do not use retarding admixtures.
  - 2. Make special provisions for curing and finishing.

#### **CONCRETE FORM PREPARATION**

- A. Comply with requirements of ACI 301 and ACI 347 for formwork, and as herein specified. The contractor is responsible for design, engineering, and construction of formwork, and for its timely removal.
  - B. Earth forms are not permitted.
  - C. Design and fabricate forms for easy removal, without impact, shock, or damage to concrete surfaces or other portions of the work.
  - D. Design to support all applied loads until concrete is adequately cured, within allowable tolerances and deflection limits.
    - 1. Shoring design shall include additional loading resulting from stressing tendons.
    - 2. Formwork shall not restrain elastic shortening, deflection, or camber resulting from prestressing forces.
  - E. Construct and brace formwork to accurately achieve end results required by contract documents, with all elements properly located and free of distortion. Provide for necessary openings, inserts, anchorages, and other features shown or otherwise required.
    - 1. Minimize form joints and make watertight to prevent leakage of concrete.
    - 2. Provide chamfered edges and corners at exposed locations, unless specifically indicated otherwise on the drawings.
    - 3. Provide openings to accommodate work of other trades, sized and located accurately. Securely support items built into forms; provide additional bracing at openings and discontinuities in formwork.
    - 4. Provide temporary openings for cleaning and inspection in most inconspicuous locations at base of forms, closed with tightfitting panels designed to minimize appearance of joints in finished concrete work.
    - 5. Build into concrete work all required ties, anchors, anchor bolts, sleeves, and other inserts. Accurately set items, by using templates, in their final position at the time concrete is placed.
  - F. Comply with minimum tolerances established in ACI 117, unless more stringent requirements are indicated on the drawings.
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- G. Provide either form materials with factory-applied nonabsorptive liner or field-applied form coating. If field-applied coating is employed, thoroughly clean and recondition formwork and reapply coating before each use. Rust on form surfaces is unacceptable.
  - H. JOINT CONSTRUCTION
  - I. Construction Joints (Cold Joints): Locate and install construction joints as indicated on Drawings. If construction joints are not indicated, or if contractor opts to add additional joints, locate in manner which will least impair strength and stability of the structure.
    - 1. Contractor shall submit location diagrams to Architect/Engineer for approval if locations are not shown on the Contract Documents.
    - 2. Provide keyways not less than 1-1/2 inches deep.
    - 3. Continue reinforcement across and perpendicular to construction joints, unless details specifically indicate otherwise.
    - 4. Provide adequate shear reinforcement as shown on the Drawings or as directed by the Engineer.
    - 5. Where a joint is to be made, the surface of the concrete shall be thoroughly cleaned. Joints shall be wetted and slushed with a coat of neat cement grout immediately before placement of new concrete. The grout shall be a neat cement and sand grout (1:3 mix) placed to a 1/2" minimum thickness. An approved bonding compound may be used in lieu of the cement grout with approval of the Architect/Engineer.
    - 6. Provide waterstops as indicated, and on all construction joints below grade adjacent to usable spaces. Install to form continuous, water tight dam, with field joints fabricated in strict accordance with manufacturer's instructions.
  - J. Movement Joints: Construct isolation joints in slabs poured on grade at points of contact with vertical components, such as foundation walls and column pedestals.
    - 1. Install joint filler to full concrete depth. Recess top edge of filler 1/8 inch where joints are unsealed.
    - 2. Slabs on grade shall be tied to foundation walls with #3 reinforcing bars at 4 feet on center unless specifically shown otherwise on the drawings.
    - 3. Smooth dowels, greased or treated one end to prevent bond shall be installed at columns and as shown on the Drawings. Refer to "Installing Dowels", this section.
  - K. Expansion Joints: Construct expansion joints where indicated. Install expansion joint filler to full depth of concrete. Recess edge of filler to depth indicated to receive joint sealant (and backer rod where necessary) specified in Division 7.
  - L. Control Joints - Slabs on grade: Spacing of joints in slabs shall not exceed three times the thickness of the slab in feet nor 15 feet on center. Joints shall typically isolate columns and shall run between columns.
    - 1. If locations of joints are not specifically shown on the Drawings, the Contractor shall submit location diagram to the Owner's Representative for approval.
    - 2. Form control joints by means of saw cuts one-fourth the depth of the slab (1-1/4" minimum), performed as soon as possible after slab finishing without possibility of dislodging aggregate.
    - 3. Use "soft-cut" type saw to perform work.
  - M. Control Joints - Walls: Construct control joints in walls at 4 feet from corners/intersections and then at 25 feet on center thereafter.
    - 1. Contractor shall submit location diagram to Architect/Engineer for approval if locations are not shown on the Drawings.
    - 2. Construct weakened plane vertical control joints as shown on the drawings. Provide adequate shear reinforcement as directed by the Architect/Engineer.
    - 3. Joints above grade shall be constructed to provide for the installation of watertight joint and sealant. Joints shall be filled with appropriate backer rod and sealant.
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4. Provide waterstops where indicated on the Drawings and on all joints below grade adjacent to usable spaces. Install to form continuous watertight dam, with field joints fabricated in strict accordance with manufacturer's instructions.

#### **INSTALLATION OF SMOOTH DOWELS**

- A. Install dowels as noted on the Drawings.
- B. One end of dowel on one side of joint shall be non-bonded, allowed to slip.
- C. Methods:
  1. Coat the non-bonded end with grease and wrap snugly with polyethylene tape. Work shall be neat and snug without excess material.
  2. Use premolded dowel caps over non-bonded end.

#### **INSTALLATION OF BUILT-IN ITEMS**

- A. Set anchorage devices and other items required for other work connected to or supported by cast-in-place concrete, using templates, setting drawings, and instructions from suppliers of items to be embedded.
- B. Set edge forms and intermediate screeds as necessary to achieve final elevations indicated for finished slab surfaces.
- C. Set anchor bolts furnished under Division 5, using templates and in coordination with steel shop drawings.
- D. Comply with requirements of Paragraph 6.3 of ACI 318.

#### **CONCRETE PLACEMENT**

- A. Provide materials necessary to ensure adequate protection of concrete during inclement weather before beginning installation of concrete.
- B. Before beginning concrete placement, inspect formwork, reinforcing steel, and items to be embedded, verifying that all such work has been completed.
- C. Moisten wood forms immediately before placing concrete in locations where form coatings are not used.
- D. Provide runways for wheeled equipment to convey concrete. Do not support runways on reinforcing or wheel equipment directly over reinforcing.
- E. Schedule continuous placement of concrete to prevent the formation of cold joints.
- F. Provide construction joints if concrete for a particular element or component cannot be placed in a continuous operation.
- G. Deposit concrete as close as possible to its final location, to avoid segregation.
- H. Limit horizontal layers to depths which can be properly consolidated, but in no event greater than 24 inches.
- I. Consolidate concrete by means of mechanical vibrators, inserted vertically in freshly placed concrete in a systematic pattern at close intervals. Penetrate previously placed concrete to ensure that separate concrete layers are knitted together.
- J. Vibrate concrete sufficiently to achieve consistent consolidation without segregation of coarse aggregates.
- K. Do not use vibrators to move concrete laterally.
- L. Strike off and level concrete slab surfaces, using highway straightedges, darbies, or bull floats before bleed water can collect on surface. Do not work concrete further until finishing operations are commenced.

#### **FINISHING FORMED SURFACES**

- A. Repair surface defects, including tie holes, immediately after removing formwork.
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- B. Remove honeycombed areas and other defective concrete down to sound concrete, cutting perpendicular to surface or slightly undercutting. Dampen patch location and area immediately surrounding it prior to applying bonding compound or patching mortar.
  - C. Before bonding compound has dried, apply patching mixture matching original concrete in materials and mix except for omission of coarse aggregate, and using a blend of white and normal portland cement as necessary to achieve color match. Consolidate thoroughly and strike off slightly higher than surrounding surface.
  - D. Unexposed Form Finish: Repair tie holes and patch defective areas. Rub down or chip off fins or other raised areas exceeding 1/4 inch height.
  - E. Exposed Form Finish:
    - 1. Repair and patch defective areas with fins or other projection completely removed and smoothed.
    - 2. Smooth Rubbed Finish: Apply to surfaces indicated no later than 24 hours after form removal. Wet concrete surfaces to be finished and rubbed with Carborundum brick or other abrasive until uniform color and texture are achieved. Do not apply separate grout mixture.
  - F. FINISHING SLABS
  - G. Finishing Operations:
    - 1. Do not directly apply water to slab surface or dust with cement.
    - 2. Screeding: Strikeoff to required grade and within surface tolerances indicated. Verify conformance to surface tolerances. Correct deficiencies while concrete is still plastic.
    - 3. Bull Floating: Immediately following screeding, bull float or darby before bleed water appears to eliminate ridges, fill in voids, and embed coarse aggregate. Recheck and correct surface tolerances.
    - 4. Do not perform subsequent finishing until excess moisture or bleed water has disappeared and concrete will support either foot pressure with less than 1/4-inch indentation or weight of power floats without damaging flatness.
    - 5. Final floating: Float to embed coarse aggregate, to eliminate ridges, to compact concrete, to consolidate mortar at surface, and to achieve uniform, sandy texture. Recheck and correct surface tolerances.
    - 6. Troweling: Trowel immediately following final floating. Apply first troweling with power trowel except in confined areas, and apply subsequent trowelings with hand trowels. Wait between trowelings to allow concrete to harden. Do not overtrowel. Begin final troweling when surface produces a ringing sound as trowel is moved over it. Consolidate concrete surface by final troweling operation. Completed surface shall be free of trowel marks, uniform in texture and appearance, and within surface tolerance specified.
    - 7. Grind smooth surface defects which would telegraph through final floor covering system.
  - H. Finishes: Coordinate appearance and texture of required final finishes with the Engineer before application.
    - 1. Broomed Float Finish: After floating and when water sheen has practically disappeared, apply uniform transverse corrugations approximately 1/16 inch deep, without tearing surface.
    - 2. Trowel Finish: As specified above.
  - I. Slab Surface Tolerances:
    - 1. Achieve flat, level planes except where grades are indicated. Slope uniformly to drains.
    - 2. Floated finishes: Depressions between high spots shall not exceed 5/16 inch under a 10-foot straightedge.
    - 3. Troweled finishes: Achieve level surface plane so that depressions between high spots shall not exceed 1/8 inch under a 10-foot straightedge.
  - J. Slab Finish Schedule: Apply finishes in the following typical locations and as otherwise shown on the drawings:
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1. Broomed float finish:
    - a. Sidewalks, exterior ramps and slabs.
  2. Trowel finish:
    - a. Exposed interior floors not otherwise scheduled.
    - b. Surfaces to receive resilient tile.
    - c. Surfaces to receive carpet.
- K. FINISHING POST TENSIONED FOUNDATION SLAB
- L. Slabs shall be screeded to bring the surface to the levels indicated on the drawings and sloped to drainage points where required. The concrete shall be further consolidated and leveled with a bull float.
- M. Surface water should not appear with a microsilica dense concrete mix. If it does, the microsilica dose and air content shall be rechecked and corrected.
- N. The finishing characteristics of microsilica dense concrete are different than other concrete. Concrete shall be floated as soon as it will support the weight of a man and a bull float. After floating, apply one manual or mechanical troweling.
- O. It is better under finish, limiting the operation to screeding, bull float, trowel and cure within one hour of placement.
- P. The use of a light fog mist to keep the air above the concrete surface at a high humidity is required during placing and finishing operations, until wet fabric is placed over the concrete.
- Q. Cure by water cure method for a minimum of seven days.

#### **CONCRETE CURING AND PROTECTION**

- A. Prevent premature drying of freshly placed concrete, and protect from excessively cold or hot temperatures until concrete has cured.
- B. Provide curing of concrete by one of the methods listed and as appropriate to service conditions and type of applied finish in each case. Curing period shall be not less than 7 days for standard cements and mixes.
- C. Evaporation retarder shall not take the place of curing compounds or water cure. It is used during finishing operations and during installation of wet covering.
- D. Cure formed concrete surfaces by moist curing with forms in place for full curing period or until forms are removed.
  1. Keep wet wooden or metal forms exposed to heat of the sun.
  2. If forms are removed prior to completion of curing process, continue curing by one of the applicable methods specified.
- E. Water Cure: The surface of finished concrete shall be kept continuously wet for a minimum of seven days.
  1. Concrete surfaces shall be kept continuously wet by sprinkling or fogging with water and by a covering material thoroughly saturated with water and kept wet by intermittent hosing. Concrete shall be protected against freezing during the curing.
  2. Covering material shall be kept continuously moist so that a film of water remains on the concrete surface throughout the curing period. Alternate cycles of wetting and drying shall not be permitted during the curing period.
  3. The use of a moisture retaining cover over burlap or a manufactured type of moisture retaining cover shall be permitted. Lap not less than 3 inches at edges and ends, and seal with waterproof tape or adhesive. Repair holes or tears during curing period with same tape or adhesive. Maintain covering in intimate contact with concrete surface. Secure to avoid displacement.
  4. Do not use plastic sheeting directly on surfaces which will be exposed to view when in service.
- F. Compound Cure: Curing compounds shall be applied immediately following last finishing operations.



1. Apply curing compound at rate stated by manufacturer to conform with moisture-retention requirements specified, using second, immediate application at right angles to first.  
Reapply if damaged by rain.
  2. Apply additional coat near substantial completion to act as sealer.
  3. Use curing compounds only in locations permitted or required. Do not apply to surfaces to receive other finishes, coatings, or coverings.
- G. Hardening Compound: Apply to concrete after initial water cure and seasoning of the concrete as recommended by manufacturer. Apply two or more applications as recommended by manufacturer to achieve maximum hardness.
- H. Avoid rapid drying at end of curing period.
- I. During and following curing period, protect concrete from temperature changes of adjacent air in excess of 5 degrees F per hour and 50 degrees F per 24 hours. Progressively adjust protective measures to provide uniform temperature changes over entire concrete surface.

#### **JOINT FILLER**

- A. Concrete surfaces shall be fully cured (minimum 120 days).
  - B. Remove debris and clean per manufacturer.
  - C. Fill full depth of crack for proper load transfer.
  - D. Install in strict accordance with manufacturer's instructions.
- E. REMOVAL OF FORMS AND SUPPORTS
- F. Non-Load-Bearing Formwork: Provided that concrete has hardened sufficiently that it will not be damaged, forms not actually supporting weight of concrete or weight of soffit forms may be removed after concrete has cured at not less than 50 degrees F for 24 hours. Maintain curing and protection operations after form removal.

#### **MISCELLANEOUS CONCRETE ITEMS**

- A. Fill in holes and openings left in concrete structures for passage of work by other trades after such work is in place. Place such fill-in concrete to blend with existing construction, using same mix and curing methods.
  - B. Provide machine and equipment bases and foundations, as indicated on drawings. Set anchor bolts at correct elevations, complying with diagrams or templates of equipment manufacturer. Misplaced or damaged anchor bolts will be subject to re-engineering fees.
  - C. Provide concrete grout for reinforced masonry where indicated on drawings and as scheduled.
  - D. Provide concrete fill for steel pair stairs and landings. Install welded wire fabric, 2x2 - 12x12 at 1/2" below finish surface.
- E. CONCRETE REPAIRS
- F. Patch tie holes, honeycomb, and other surface imperfections in accordance with ACI 301 and as directed by the Engineer.
- G. Defective concrete is defined as concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- H. Repair or replacement of defective concrete or surface imperfections shall be as determined by the Engineer.
- I. Do not patch, fill, touch-up, repair, or replace any concrete except upon specific approval of methods and materials by the Engineer for each individual area.

#### **REMOVAL OF EXISTING CONCRETE**

- A. Saw cut surfaces or drill holes at regular intervals sufficient to establish a fracture plane for removal by power tools.
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- B. Salvage all existing reinforcing; do not cut away until specifically directed by the Architect/Engineer, or as shown on the Drawings.
  - C. New work bonded to existing work:
    - 1. Clean and roughen existing surface by sandblasting, waterblasting, scabblor, or other approved method.
    - 2. Embed dowels and reinforcing as detailed on the Drawings.
    - 3. Coat surface with bonding agent applied in strict accordance with manufacturer's instructions.
  - D. Existing work cut away for new work.
    - 1. Saw cutting and removal shall continue to within 1/4" of the finished surface. The final 1/4" removal shall be completed by grinding to the final surface.
    - 2. Cut existing reinforcing bars 1/2" below the surface. Coat with anti-corrosion protective coating. Grout holes.
    - 3. Provide bond breaker where new concrete work is adjacent to existing work but structurally separate.
  - E. QUALITY CONTROL TESTING DURING CONSTRUCTION
    - 1. (Performed by Owner's Special Inspector)
  - F. Composite Sampling, and Making and Curing of Specimens: ASTM C 172 and ASTM C 31.
    - 1. Take samples at point of discharge.
    - 2. For pumped concrete, perform sampling and testing at the frequencies specified herein at point of delivery to pump, and perform additional sampling and testing at the same frequency at discharge from line. Results obtained at discharge from line shall be used for acceptance of concrete.
  - G. Slump: ASTM C 143. One test per batch. Modify sampling to comply with ASTM C 94.
  - H. Air Content of Normal Weight Concrete: ASTM C 173 or ASTM C 231. One test per strength test performed on air-entrained concrete.
  - I. Air Content of Lightweight Concrete: ASTM C 173. One test per strength test performed on air-entrained concrete.
  - J. Air-Dry Weight of Lightweight Concrete: ASTM C 567. Determine fresh unit weight once per strength test and report approximate air-dry weight of concrete represented.
  - K. Concrete Temperature: One test per strength test.
  - L. Compressive Strength Tests: ASTM C 39.
    - 1. Mold and cure one set of 4 standard cylinders for each compressive strength test required.
    - 2. Obtain samples on a statistically sound, random basis, minimum frequency as follows:
      - a. One set per 100 cubic yards or fraction thereof for each day's pour of each concrete class.
      - b. One set per 3500 square feet of slab or wall area or fraction thereof for each day's pour of each concrete class.
      - c. When the above testing frequency would provide fewer than 5 strength tests for a given class of concrete during the project, conduct testing from not less than 5 randomly selected batches, or from each batch if fewer than 5.
    - 3. Test Schedule:
      - a. Test one specimen per set at 7 days for information unless an earlier age is required.
      - b. Test two specimens per set for acceptance of strength potential; test at 28 days unless other age is specified. The test result shall be the average of the two specimens. If one specimen shows evidence of improper sampling, molding, or testing, the test result shall be the result of the remaining specimen.
      - c. Retain one specimen from each set for later testing, if required.
-



4. Strength potential of as-delivered concrete will be considered acceptable if all of the following criteria are met:
    - a. No individual test result falls below specified compressive strength by more than 500 psi.
    - b. Not more than 10 percent of individual test results fall below specified compressive strength  $f'(c)$ .
    - c. Average of any 3 consecutive strength test results equals or exceeds specified compressive strength  $f'(c)$ .
  5. Testing for evaluation of field curing:
    - a. Frequency: One field set of specimens per strength acceptance test.
    - b. Mold specimens from same sample used for strength acceptance tests. Field-cure, and test at same age as for strength acceptance tests.
    - c. Evaluate construction and curing procedures and implement corrective action when strength results for field-cured specimens are less than 85 percent of test values for companion laboratory-cured specimens.
- M. Test Results: Testing agency shall report test results in writing to Owner's Representative and contractor within 24 hours of test.
1. Test reports shall contain the following data:

**PROJECT NAME, NUMBER, AND OTHER IDENTIFICATION.**

- a. Name of concrete testing agency.
  - b. Date and time of sampling.
  - c. Concrete type and class.
  - d. Location of concrete batch in the completed work.
  - e. All information required by respective ASTM test methods.
2. Nondestructive testing devices such as impact hammer or sonoscope may be used at Owner's Representative option for assistance in determining probable concrete strength at various locations or for selecting areas to be cored, but such tests shall not be the sole basis for acceptance or rejection.
  3. The testing agency shall make additional tests of in-place concrete as directed by the Owner's Representative when test results indicate that specified strength and other concrete characteristics have not been attained.
    - a. Testing agency may conduct tests of cored cylinders complying with ASTM C 42, or tests as directed.
    - b. Cost of additional testing shall be borne by the Contractor when unacceptable concrete has been verified.

**END OF SECTION**



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**SECTION 03 3053**  
**MISCELLANEOUS CAST-IN-PLACE CONCRETE**

**MISCELLANEOUS CAST-IN-PLACE CONCRETE****PART 1 GENERAL****2.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**2.02 SUMMARY**

- A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.
  - 1. Concrete chimney caps and bands.

**2.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings showing dimensions, reinforcing, etc.
- C. Design Mixtures: For each concrete mixture.

**2.04 QUALITY ASSURANCE**

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

**PART 1 PRODUCTS****3.01 CONCRETE, GENERAL**

- A. Comply with the following sections of ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents:
  - 1. "General Requirements."
  - 2. "Formwork and Formwork Accessories."
  - 3. "Reinforcement and Reinforcement Supports."
  - 4. "Concrete Mixtures."
  - 5. "Handling, Placing, and Constructing."
- B. Comply with ACI 117 (ACI 117M).

**3.02 STEEL REINFORCEMENT**

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60 (Grade 420), deformed.
- B. Plain-Steel Wire: ASTM A1064/A1064M, as drawn.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

**3.03 CONCRETE MATERIALS**

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
  - B. Cementitious Materials:
    - 1. Portland Cement: ASTM C150/C150M.
  - C. Normal-Weight Aggregate: ASTM C33/C33M, 1/2-inch nominal maximum aggregate size.
  - D. Air-Entraining Admixture: ASTM C260/C260M.
  - E. Water: Potable and complying with ASTM C94/C94M.
-



**3.04 CURING MATERIALS**

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

**3.05 CONCRETE MIXTURES**

- A. Comply with ACI 301 (ACI 301M).
- B. Normal-Weight Concrete:
  - 1. Minimum Compressive Strength: 4,000 psi (27.6 MPa) at 28 days.
  - 2. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).
  - 3. Air Content: 6 percent plus or minus 1 percent.

**3.06 CONCRETE MIXING**

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94M, and furnish batch ticket information.
  - 1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
  - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

**PART 1 EXECUTION****4.01 FORMWORK INSTALLATION**

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301 (ACI 301M).

**4.02 EMBEDDED ITEM INSTALLATION**

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

**4.03 STEEL REINFORCEMENT INSTALLATION**

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

**4.04 CONCRETE PLACEMENT**

- A. Comply with ACI 301 (ACI 301M) for placing concrete.
  - B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M).
  - C. Consolidate concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
-



**4.05 FINISHING FORMED SURFACES**

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm).
  - 1. Apply to concrete surfaces to receive a rubbed finish.
- B. Rubbed Finish: Apply the following rubbed finish, defined in ACI 301 (ACI 301M), to smooth-formed-finished as-cast concrete where indicated:
  - 1. Smooth-rubbed finish.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

**4.06 FINISHING UNFORMED SURFACES**

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
  - 1. Do not further disturb surfaces before starting finishing operations.
- C. Float Finish: Apply float finish to surfaces to receive trowel finish.
- D. Trowel Finish: Apply a hard trowel finish.

**4.07 CONCRETE PROTECTING AND CURING**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 305.1 (ACI 305.1M) for hot-weather protection during curing.
  - B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
  - C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
  - D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:
    - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      - a. Water.
      - b. Continuous water-fog spray.
      - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
    - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
    - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
-



**4.08 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

**END OF SECTION**



**SECTION 04 0120  
MAINTENANCE OF UNIT MASONRY****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes maintenance of unit masonry consisting of brick clay and cast stone masonry restoration and cleaning as follows:
- B. Unused anchor removal.
  - 1. Repairing unit masonry, including replacing units.
  - 2. Painting steel uncovered during the work.
  - 3. Reanchoring veneers.
  - 4. Repointing joints.
  - 5. Preliminary cleaning, including removing plant growth.
  - 6. Cleaning exposed unit masonry surfaces.

**1.02 DEFINITIONS**

- A. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

**1.03 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Samples for Verification: For the following:
  - 1. Each type of masonry unit to be used for replacing existing units. Include sets of Samples as necessary to show the full range of shape, color, and texture to be expected.
  - 2. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches long by 1/4 inch wide, set in aluminum or plastic channels.
    - a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

**1.04 QUALITY ASSURANCE**

- A. Source Limitations: Obtain each type of material for masonry restoration (face brick, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.
- B. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect. Perform additional paint and stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.
  - B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
  - C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
  - D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
  - E. Store sand where grading and other required characteristics can be maintained and contamination avoided.
-



**1.06 PROJECT CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.
- B. Repair masonry units and repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.
- C. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing unless otherwise indicated:
  - 1. When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.
  - 2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair and pointing.
- D. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.
- E. Clean masonry surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.

**1.07 SEQUENCING AND SCHEDULING**

- A. Order replacement materials at earliest possible date to avoid delaying completion of the Work.
- B. Perform masonry restoration work in the following sequence:
  - 1. Remove plant growth.
  - 2. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
  - 3. Repair masonry, including replacing existing masonry with new masonry materials.
  - 4. Rake out mortar from joints to be repointed.
  - 5. Point mortar joints.
  - 6. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
  - 7. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
  - 8. Remove paint.
  - 9. Clean masonry surfaces.

**PART 2 PRODUCTS****2.01 MASONRY MATERIALS**

- A. Face Brick: Provide face brick, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.
  - 1. Provide units with colors, color variation within units, surface texture, size, and shape to match existing brickwork.
- B. Salvaged Brick: Obtain salvaged brick from repair locations shown on Drawings. Clean off residual mortar.

**2.02 MORTAR MATERIALS**

- A. Portland Cement: ASTM C 150, Type I or Type II, white or gray or both where required for color matching of exposed mortar.
-



1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Sand: ASTM C 144 unless otherwise indicated.
  1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
- D. Water: Potable.

### 2.03 PAINT REMOVERS

- A. Alkaline Paste Paint Remover: Manufacturer's standard alkaline paste formulation for removing paint coatings from masonry.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. ABR Products, Inc.; 800 Brush Grade.
    - b. Diedrich Technologies Inc.; 606 Multi-Layer Paint Remover or 606X Extra Thick Multi-Layer Paint Remover.
    - c. Hydroclean, Hydrochemical Techniques, Inc.; Hydroclean HT-716 Heavy Duty Paint Remover.
    - d. Price Research, Ltd.; Price Heavy Duty Paint Stripper.
    - e. PROSOCO; Enviro Klean Safety Peel 2, Sure Klean Heavy-Duty Paint Stripper, or Sure Klean Heavy-Duty Paint Stripper D.
- B. Covered or Skin-Forming Alkaline Paint Remover: Manufacturer's standard covered or skin-forming alkaline formulation for removing paint coatings from masonry.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. ABR Products, Inc.; Grip 'N Strip 800 Fast Acting.
    - b. Diedrich Technologies Inc.; 606 Multi-Layer Paint Remover or 606X Extra Thick Multi-Layer Paint Remover with pull-off removal system.
    - c. Dumond Chemicals, Inc.; Peel Away 1 System.
    - d. PROSOCO; Enviro Klean Safety Peel 1 or Enviro Klean Safety Peel 3 with Enviro Klean Overcoat.
- C. Solvent-Type Paint Remover: Manufacturer's standard water-rinsable, solvent-type gel formulation for removing paint coatings from masonry.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. ABR Products, Inc.; Super Bio Strip Gel.
    - b. Diedrich Technologies Inc.; 505 Special Coatings Stripper.
    - c. Dumond Chemicals, Inc.; Peel Away 2.
    - d. Hydroclean, Hydrochemical Techniques, Inc.; Hydroclean HT-300 Solvent Paint Remover.
    - e. Price Research, Ltd.; Price Strip-All.
    - f. PROSOCO; Sure Klean Fast Acting Stripper.

### 2.04 CLEANING MATERIALS

- A. Water: Potable.
- B. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.
- C. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.



**2.05 ACCESSORY MATERIALS**

- A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. ABR Products, Inc.; Rubber Mask.
    - b. Price Research, Ltd.; Price Mask.
    - c. PROSOCO; Sure Klean Strippable Masking.
- B. Masonry Repair Anchors, Expansion Type: Mechanical fasteners designed for masonry veneer stabilization consisting of 1/4-inch- diameter, Type 304 stainless-steel rod with brass expanding shells at each end and water-shedding washer in the middle. Expanding shells shall be designed to provide positive mechanical anchorage to veneer on one end and backup masonry on the other.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. BLOK-LOK Limited; Torq-Lok.
    - b. Dur-O-Wal, a division of Dayton Superior; Dur-O-Wal Repair Anchor.
    - c. Hohmann & Barnard, Inc.; #521RA-B Restoration Anchor.
- C. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.
- D. Miscellaneous Products: Select materials and methods of use based on the following, subject to approval of a mockup:
  - 1. Previous effectiveness in performing the work involved.
  - 2. Little possibility of damaging exposed surfaces.
  - 3. Consistency of each application.
  - 4. Uniformity of the resulting overall appearance.
  - 5. Do not use products or tools that could do the following:
    - a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
    - b. Leave a residue on surfaces.

**2.06 MORTAR MIXES**

- A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
    - 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
  - B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
  - C. Do not use admixtures in mortar unless otherwise indicated.
  - D. Mortar Proportions: Mix mortar materials in the following proportions:
    - 1. Pointing Mortar for Brick: 1 part portland cement, 2 parts lime, and 6 parts sand.
    - 2. Rebuilding (Setting) Mortar: Same as pointing mortar.
-



**PART 3 EXECUTION****3.01 PROTECTION**

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.
- B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
  - 1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
  - 2. Keep wall wet below area being cleaned to prevent streaking from runoff.
  - 3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
  - 4. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- C. Prevent mortar from staining face of surrounding masonry and other surfaces.
  - 1. Cover sills, ledges, and projections to protect from mortar droppings.
  - 2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
  - 3. Immediately remove mortar in contact with exposed masonry and other surfaces.
  - 4. Clean mortar splatters from scaffolding at end of each day.
  - 5. Provide temporary rain drainage during work to direct water away from building.

**3.02 UNUSED ANCHOR REMOVAL**

- A. Remove masonry anchors, brackets, wood nailers, and other extraneous items no longer in use unless indicated to remain.
  - 1. Remove items carefully to avoid spalling or cracking masonry.
  - 2. Where directed, if an item cannot be removed without damaging surrounding masonry, do the following:
    - a. Cut or grind off item approximately 3/4 inch beneath surface and core drill a recess of same depth in surrounding masonry as close around item as practical.
    - b. Immediately paint exposed end of item with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended dry film thickness per coat. Keep paint off sides of recess.
  - 3. Patch the hole where each item was removed unless directed to remove and replace the masonry unit.

**3.03 BRICK REMOVAL AND REPLACEMENT**

- A. At locations indicated, remove bricks that are misaligned or bulged and are to be reused. Carefully remove entire units from joint to joint, without damaging surrounding masonry.
    - 1. When removing single bricks, remove material from center of brick and work toward outside edges.
  - B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
  - C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.
-



- D. Remove in an undamaged condition as many whole bricks as possible.
  - 1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
  - 2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
  - 3. Store brick for reuse. Store off ground, on skids, and protected from weather.
- E. Replace removed brick with other removed brick and salvaged brick in good quality, where possible, or with new brick matching existing brick, including size. Do not use broken units unless they can be cut to usable size.
- F. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
  - 1. Maintain joint width for replacement units to match existing joints.
  - 2. Use setting buttons or shims to set units accurately spaced with uniform joints.
- G. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
  - 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
  - 2. Rake out mortar used for laying brick before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
  - 3. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

### **3.04 REANCHORING VENEERS**

- A. Install masonry repair anchors in horizontal mortar joints and according to manufacturer's written instructions. Install at not more than 16 inches o.c. vertically and 32 inches o.c. horizontally unless otherwise indicated. Install at locations to avoid penetrating flashing.
- B. Recess anchors at least 5/8 inch from surface of mortar joint and fill recess with pointing mortar.

### **3.05 PAINTING STEEL UNCOVERED DURING THE WORK**

- A. Inspect steel exposed during masonry removal. Where Architect determines that it is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
  - 1. Remove paint, rust, and other contaminants according to SSPC-SP 3, "Power Tool Cleaning" as applicable to meet paint manufacturer's recommended preparation.
  - 2. Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).
- B. If on inspection and rust removal, the cross section of a steel member is found to be reduced from rust by more than 1/16 inch, notify Architect before proceeding.

### **3.06 CLEANING MASONRY, GENERAL**

- A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.
  - B. Use only those cleaning methods indicated for each masonry material and location.
    - 1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
-



2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
  - a. Equip units with pressure gages.
3. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
- C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.
- D. Water Application Methods:
  1. Water-Soak Application: Soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
  2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- E. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

### **3.07 PRELIMINARY CLEANING**

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.
- B. Removing Extraneous Substances: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.
  1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
  2. Remove paint and calking with alkaline paint remover.
    - a. Comply with requirements in "Paint Removal" Article.
    - b. Repeat application up to two times if needed.
  3. Remove asphalt and tar with solvent-type paint remover.
    - a. Comply with requirements in "Paint Removal" Article.
    - b. Apply paint remover only to asphalt and tar by brush without prewetting.
    - c. Allow paint remover to remain on surface for 10 to 30 minutes.
    - d. Repeat application if needed.

### **3.08 PAINT REMOVAL**

- A. Paint Removal with Alkaline Paste Paint Remover:
    1. Remove loose and peeling paint using low-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
    2. Apply paint remover to dry, painted masonry with brushes.
    3. Allow paint remover to remain on surface for period recommended by manufacturer.
    4. Rinse with cold water applied by low-pressure spray to remove chemicals and paint residue.
    5. Repeat process if necessary to remove all paint.
    6. Apply manufacturer's recommended afterwash to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let afterwash remain on surface as a neutralizing agent for period recommended by afterwash manufacturer.
    7. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
-



- B. Paint Removal with Covered or Skin-Forming Alkaline Paint Remover:
  - 1. Remove loose and peeling paint using low-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
  - 2. Apply paint remover to dry, painted masonry with trowel, spatula, or as recommended by manufacturer.
  - 3. Apply cover, if required by manufacturer, per manufacturer's written instructions.
  - 4. Allow paint remover to remain on surface for period recommended by manufacturer or as determined in test panels.
  - 5. Scrape off paint and remover and collect for disposal.
  - 6. Rinse with cold water applied by low-pressure spray to remove chemicals and paint residue.
  - 7. Use alkaline paste paint remover, according to "Paint Removal with Alkaline Paste Paint Remover" Paragraph, if necessary to remove remaining paint.
  - 8. Apply manufacturer's recommended afterwash to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let afterwash remain on surface as a neutralizing agent for period recommended by afterwash manufacturer.
  - 9. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
- C. Paint Removal with Solvent-Type Paint Remover:
  - 1. Remove loose and peeling asphalt and tar using low-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
  - 2. Apply thick coating of paint remover to masonry with natural-fiber cleaning brush, deep-nap roller, or large paint brush.
  - 3. Allow paint remover to remain on surface for period recommended by manufacturer. Agitate periodically with stiff-fiber brush.
  - 4. Rinse with cold water applied by low-pressure spray to remove chemicals and asphalt or tar residue.

### 3.09 CLEANING BRICKWORK AND CAST STONE

- A. Cold-Water Soak:
    - 1. Apply cold water by intermittent spraying to keep surface moist.
    - 2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.
    - 3. Apply water in cycles with at least 30 minutes between cycles.
    - 4. Continue spraying until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
    - 5. Continue spraying for 72 hours.
    - 6. Remove soil and softened surface encrustation from masonry with cold water applied by low-pressure spray.
  - B. Detergent Cleaning:
    - 1. Wet masonry with cold water applied by low-pressure spray.
    - 2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
    - 3. Rinse with cold water applied by low-pressure spray to remove detergent solution and soil.
  - C. Mold, Mildew, and Algae Removal:
    - 1. Wet masonry with cold water applied by low-pressure spray.
    - 2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
    - 3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
-



4. Rinse with cold water applied by low-pressure spray to remove mold, mildew, and algae remover and soil.

### 3.10 REPOINTING MASONRY

- A. Rake out and repoint joints to the following extent:
  1. All joints in areas indicated.
  2. Joints where mortar is missing or where they contain holes.
  3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
  4. Cracked joints where cracks are 1/16 inch or more in width and of any depth.
  5. Joints where they sound hollow when tapped by metal object.
  6. Joints where they are worn back 1/4 inch or more from surface.
  7. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
  8. Joints where they have been filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
  1. Remove mortar from joints to depth of joint width plus 1/8 inch, but not less than 1/2 inch or not less than that required to expose sound, unweathered mortar.
  2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
  3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
    - a. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet. Strictly adhere to approved quality-control program.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- E. Pointing with Mortar:
  1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing applications so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
  2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
  3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
  4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
  5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.
  6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.



**3.11 FINAL CLEANING**

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
  - 1. Do not use metal scrapers or brushes.
  - 2. Do not use acidic or alkaline cleaners.
- B. Wash adjacent woodwork and other nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

**END OF SECTION**



**SECTION 04 2113  
BRICK MASONRY**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Face brick.
  - 2. Mortar and grout.
  - 3. Reinforcing, ties and anchors.
  - 4. Embedded flashing.
  - 5. Miscellaneous masonry accessories.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
  - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
- C. Samples for Initial Selection:
  - 1. Face brick.
  - 2. Colored mortar.
- D. Samples for Verification: For each type and color of the following:
  - 1. Face brick, in the form of straps of five or more bricks.
  - 2. Colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
  - 3. Accessories embedded in masonry.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Material Certificates: For each type and size of the following:
  - 1. Masonry units.
    - a. Include material test reports substantiating compliance with requirements.
    - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
    - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
  - 2. Cementitious materials. Include brand, type, and name of manufacturer.
  - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  - 4. Grout mixes. Include description of type and proportions of ingredients.
  - 5. Anchors, ties, and metal accessories.
- B. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

**1.05 QUALITY ASSURANCE**

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
  - B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
  - C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
-



## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## **1.07 PROJECT CONDITIONS**

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls and hold cover securely in place.
  - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

## **PART 1 PRODUCTS**

### **2.01 MASONRY UNITS, GENERAL**

- A. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

### **2.02 BRICK**

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.
-



1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
- B. Face Brick: Facing brick complying with ASTM C 216.
  1. Products: Provide brick that matches the existing brick at the chimneys:
  2. Grade: SW.
  3. Type: FBX.
  4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
  5. Size (Actual Dimensions): match size of existing brick.
  6. Application: Use where brick is exposed unless otherwise indicated.
  7. Where indicated to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.

### **2.03 MORTAR MATERIALS**

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91.
- E. Mortar Cement: ASTM C 1329.
- F. Colored Cement Product: Packaged blend made from portland cement and hydrated lime, masonry cement, or mortar cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
  1. Formulate blend as required to produce color to match existing mortar color.
- G. Aggregate for Mortar: ASTM C 144.
  1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
  2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
  3. White-Mortar Aggregates: Natural white sand or crushed white stone.
  4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

### **2.04 REINFORCEMENT**

- A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
- B. Horizontal Joint Reinforcement: Hohmann & Barnard, Inc. 120 Truss-Mesh, stainless steel; Type 316, 9 ga. Side x 9 ga. Cross wires, or equivalent.

### **2.05 TIES AND ANCHORS**

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
    1. Stainless-Steel Wire: ASTM A 580/A 580M, Type 316.
    2. Stainless-Steel Sheet: ASTM A 666, Type 316.
-



## **2.06 EMBEDDED FLASHING MATERIALS**

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
  - 1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch (0.40 mm) thick.
  - 2. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.
  - 3. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
  - 4. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
- B. Application: Unless otherwise indicated, use the following:
  - 1. Where flashing is indicated to receive counterflashing, use metal flashing.
  - 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
  - 3. Where flashing is fully concealed, use metal flashing.
- C. Solder and Sealants for Sheet Metal Flashings:
  - 1. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
  - 2. Elastomeric Sealant: ASTM C 920, chemically curing urethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## **2.07 MASONRY CLEANERS**

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

## **2.08 MORTAR MIXES**

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
    - 1. Do not use calcium chloride in mortar.
    - 2. Use portland cement-lime, masonry cement, or mortar cement mortar unless otherwise indicated.
    - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
  - B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
  - C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide Type N unless another type is indicated.
  - D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
    - 1. Mix to match color of existing mortar at chimneys.
    - 2. Application: Use colored aggregate mortar for exposed mortar joints.
-



## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION, GENERAL**

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
  - 1. Mix units from several pallets or cubes as they are placed.
- D. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- E. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

### **3.03 TOLERANCES**

- A. Dimensions and Locations of Elements:
    - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
    - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
    - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
  - B. Lines and Levels:
    - 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
    - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
    - 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
    - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
    - 5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
    - 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
    - 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.
  - C. Joints:
    - 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm); do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
-



2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).
3. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

### **3.04 LAYING MASONRY WALLS**

- A. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond to match existing; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

### **3.05 MORTAR BEDDING AND JOINTING**

- A. Lay hollow brick as follows:
  1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
  2. With entire units, including areas under cells, fully bedded in mortar at starting course on footings.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints to match existing.

### **3.06 FLASHING**

- A. General: Install embedded flashing in masonry where indicated.
- B. Install flashing as follows unless otherwise indicated:
  1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
- C. Install reglets and nailers for flashing and other related construction where required.

### **3.07 FIELD QUALITY CONTROL**

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
- B. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

### **3.08 REPAIRING, POINTING, AND CLEANING**

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
  - B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
  - C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
  - D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
    1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
    2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
-



3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20."

### **3.09 MASONRY WASTE DISPOSAL**

- A. Masonry Waste: Remove masonry waste, and legally dispose of off Owner's property.

**END OF SECTION**



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**SECTION 04 2200  
CONCRETE UNIT MASONRY**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Concrete masonry units.
  - 2. Mortar and grout.
  - 3. Steel reinforcing bars.
  - 4. Masonry-joint reinforcement.
  - 5. Embedded flashing.
  - 6. Miscellaneous masonry accessories.

**1.02 DEFINITIONS**

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
  - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  - 2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
  - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
  - 1. Colored mortar.
  - 2. Weep holes/vents.
- D. Samples for Verification: For each type and color of the following:
  - 1. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For testing agency.
  - B. Material Certificates: For each type and size of the following:
    - 1. Masonry units.
      - a. Include material test reports substantiating compliance with requirements.
      - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
    - 2. Integral water repellent used in CMUs.
    - 3. Cementitious materials. Include name of manufacturer, brand name, and type.
    - 4. Mortar admixtures.
    - 5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
    - 6. Grout mixes. Include description of type and proportions of ingredients.
    - 7. Reinforcing bars.
    - 8. Joint reinforcement.
    - 9. Anchors, ties, and metal accessories.
  - C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
-



1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

#### **1.06 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
  1. Build sample panels for typical exterior wall in sizes approximately 48 inches long by 48 inches high by full thickness.
  2. Build sample panels facing south.
  3. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
  4. Protect approved sample panels from the elements with weather-resistant membrane.
  5. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
    - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

#### **1.08 FIELD CONDITIONS**

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.



- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
  - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
  - 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

### **2.03 UNIT MASONRY, GENERAL**

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### **2.04 CONCRETE MASONRY UNITS**

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
    - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
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2. Provide square-edged units for outside corners unless otherwise indicated.
  - B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
    1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514/E 514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
  - C. CMUs: ASTM C 90.
    1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
    2. Density Classification: Normal weight.
    3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
    4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
    5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.
  - D. Concrete Building Brick: ASTM C 55.
    1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
    2. Density Classification: Normal weight.
    3. Size (Actual Dimensions): 3-5/8 inches wide by high by 7-5/8 inches long.
  - E. Decorative CMUs: ASTM C 90.
    1. Split rib decorative unit masonry (Rudolf Block) used as veneer
      - a. Local Supplier; Smithtown Concrete Products.
    2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
    3. Density Classification: Normal weight.
    4. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.
    5. Pattern and Texture:
      - a. Pattern: Split-ribbed finish. Match Architect's samples.
    6. Colors: Match Architect's samples.
    7. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

## **2.05 MORTAR AND GROUT MATERIALS**

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
    1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
  - B. Hydrated Lime: ASTM C 207, Type S.
  - C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
  - D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Davis Colors.
      - b. Lanxess Corporation.
      - c. Solomon Colors, Inc.
  - E. Aggregate for Mortar: ASTM C 144.
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1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
  2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
  3. White-Mortar Aggregates: Natural white sand or crushed white stone.
  4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- F. Aggregate for Grout: ASTM C 404.
- G. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ACM Chemistries.
    - b. BASF Corporation - Admixture Systems.
    - c. Grace Construction Products; W.R. Grace & Co. -- Conn.
- H. Water: Potable.

## **2.06 REINFORCEMENT**

- A. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A 951/A 951M.
1. Interior Walls: Mill- galvanized carbon steel.
  2. Spacing of Cross Rods: Not more than 16 inches o.c.
  3. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

## **2.07 TIES AND ANCHORS**

- A. General: Ties and anchors shall extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
  2. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, stainless-steel wire.
  2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.25-inch- diameter, stainless-steel wire.
- D. Adjustable Anchors for Connecting to Steel Stud Framing
1. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Dayton Superior Corporation, Dur-O-Wal Division; D/A 213 or D/A 210 with D/A 700-708.
      - 2) Heckmann Building Products Inc.; 315-D with 316 or Pos-I-Tie.
      - 3) Hohmann & Barnard, Inc.; DW-10, DW-10HS or DW-10-X.
      - 4) Wire-Bond; 1004, Type III or RJ-711.
    - b. Fabricate sheet metal anchor sections and other sheet metal parts from 0.075-inch-thick, steel sheet, galvanized after fabrication.
    - c. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.187-inch- diameter, hot-dip galvanized steel wire.



- E. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
  - 1. Tie Section: Triangular-shaped wire tie made from 0.187-inch-diameter, hot-dip galvanized steel wire.
- F. Partition Top Anchors: 0.105-inch-thick metal plate with a 3/8-inch-diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

## **2.08 EMBEDDED FLASHING MATERIALS**

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
  - 1. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304, 0.016 inch thick.
  - 2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
  - 3. Fabricate through-wall metal flashing embedded in masonry from stainless steel, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Cheney Flashing Company.
      - 2) Keystone Flashing Company, Inc.
  - 4. Fabricate through-wall flashing with snaplock receiver on exterior face to receive counterflashing at roof areas
  - 5. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
  - 6. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
  - 7. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
- B. Application: Unless otherwise indicated, use the following:
  - 1. Where flashing is indicated to receive counterflashing, use metal flashing.
  - 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
  - 3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
  - 4. Where flashing is fully concealed, use metal flashing.
- C. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Mortar Net Solutions.
- D. Solder and Sealants for Sheet Metal Flashings:
  - 1. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
  - 2. Elastomeric Sealant: ASTM C 920, chemically curing silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.



## **2.09 MISCELLANEOUS MASONRY ACCESSORIES**

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep/Vent Products: Use the following unless otherwise indicated:
  - 1. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch OD by 4 inches long.
  - 2. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

## **2.10 MORTAR AND GROUT MIXES**

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement-lime mortar unless otherwise indicated.
  - 3. For exterior masonry, use portland cement-lime mortar.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
  - 1. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
  - 1. Pigments shall not exceed 10 percent of portland cement by weight.
  - 2. Mix to match Architect's sample.
  - 3. Application: Use pigmented mortar for exposed mortar joints with the following units:
    - a. Decorative CMUs.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
    - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
    - 2. Verify that foundations are within tolerances specified.
    - 3. Verify that reinforcing dowels are properly placed.
    - 4. Verify that substrates are free of substances that would impair mortar bond.
  - B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.
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- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION, GENERAL**

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

### **3.03 TOLERANCES**

- A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
  2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
  3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
  2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
  3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
  4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
  5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
  6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
  7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.
- C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
  2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
  3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
  4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

### **3.04 LAYING MASONRY WALLS**

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
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- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
  - 1. Install compressible filler in joint between top of partition and underside of structure above.
  - 2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
  - 3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
  - 4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078446 "Fire Resistive Joint Systems."

### **3.05 MORTAR BEDDING AND JOINTING**

- A. Lay hollow CMUs as follows:
  - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  - 3. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

### **3.06 MASONRY JOINT REINFORCEMENT**

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
  - 1. Space reinforcement not more than 16 inches o.c.
  - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
  - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### **3.07 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE**

- A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
  - 1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.



2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

### **3.08 ANCHORING MASONRY VENEERS**

- A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
  1. Fasten screw-attached anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
  2. Embed connector sections and continuous wire in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
  3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than 1 anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

### **3.09 CONTROL AND EXPANSION JOINTS**

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry:
  1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
  2. Install preformed control-joint gaskets designed to fit standard sash block.
  3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
  4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

### **3.10 ANCHORING MASONRY VENEERS**

- A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
  1. Fasten screw-attached anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
  2. Embed connector sections and continuous wire in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
  3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than 1 anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

### **3.11 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS**

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:



1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and through inner wythe to within 1/2 inch of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches on interior face.
  3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under building paper or building wrap, lapping at least 4 inches.
  4. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
  5. Interlock end joints of sheet metal flashing by overlapping not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Division 07 Section "Joint Sealants" for application indicated.
  6. Install metal sealant stops with sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Division 07 Section "Joint Sealants" for application indicated.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- E. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
1. Use specified weep/vent products or open head joints to form weep holes.
  2. Space weep holes 24 inches o.c. unless otherwise indicated.
- F. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products or open head joints to form vents.
1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.12 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level C in TMS 402/ACI 530/ASCE 5.
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.



- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- G. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- I. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

### **3.13 REPAIRING, POINTING, AND CLEANING**

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

### **3.14 MASONRY WASTE DISPOSAL**

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
  - 1. Crush masonry waste to less than 4 inches in each dimension.
  - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
  - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

**END OF SECTION**

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**SECTION 05 1200**  
**STRUCTURAL STEEL FRAMING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Structural steel.

**1.02 DEFINITIONS**

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

**1.03 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
  - 1. Include details of cuts, connections, holes, and other pertinent data.
  - 2. Include embedment drawings.
  - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
  - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts.
  - 5. For structural-steel connections indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Qualification Data: For Installer, fabricator, professional engineer and testing agency.
- E. Mill and Product Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
  - 1. Structural steel including chemical and physical properties.
  - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 3. Shop primers.
  - 4. Nonshrink grout.
- F. Source quality-control test reports.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.
  - B. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
  - C. Fabricators certified under the AISC Quality Certification Program in a category of structural steel work appropriate to the work defined are exempt from Special Inspection requirements for "On premises inspection of fabricated items", and "Review each Fabricator's quality control procedures" as listed in Division 01 Section "Code Required Special Inspections and Procedures." Non-AISC fabricators shall be subject to these special inspections, and shall be responsible for the inspection costs associated with these inspections.
  - D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
  - E. Comply with applicable provisions of the following specifications and documents:
    - 1. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
    - 2. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
    - 3. AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
    - 4. AISC's "Specification for the Design of Steel Hollow Structural Sections."
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- 5. AISC's "Specification for Allowable Stress Design of Single-Angle Members."
- 6. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
- G. Survey of existing conditions,
- H. Field quality-control and special inspection reports.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
  - 1. Store fasteners in a protected place. Clean and re-lubricate bolts and nuts that become dry or rusty before use.
  - 2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

#### **1.06 COORDINATION**

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.
  - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- C. Coordinate installation on anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.
  - 1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction – 13th Edition, Allowable Stress Design," Part 9.
  - 2. Engineering Responsibility: Fabricator's responsibilities include using a qualified professional engineer to prepare structural analysis data for structural-steel connections.

#### **2.02 STRUCTURAL-STEEL MATERIALS**

- A. W-Shapes: ASTM A 992 [and ASTM A 572, Grade 50].
- B. Channels, Angles-Shapes: ASTM A 36 [and ASTM A 572, Grade 50].
- C. Plate and Bar: ASTM A 36 [and ASTM A 572, Grade 50].
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Welding Electrodes: Comply with AWS requirements.

#### **2.03 BOLTS, CONNECTORS, AND ANCHORS**

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563, Grade C, heavy hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.



1. Direct-Tension Indicators: ASTM F 959, Type 325 compressible-washer type with plain finish.
- B. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.
- C. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.
- D. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

#### **2.04 PRIMER**

- A. Primer: Comply with Division 09 Sections "Exterior Painting," "Interior Painting," and "High Performance Painting."
- B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible topcoat.
- C. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

#### **2.05 FABRICATION**

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
  1. Identify high-strength structural steel according to ASTM A 6 and maintain markings until structural steel has been erected.
  2. Mark and match-mark materials for field assembly.
  3. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
  4. Fabricate beam with rolling camber up.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.B
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
  1. Do not thermally cut bolt holes or enlarge holes by burning.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.
  1. Cut, drill, or punch holes perpendicular to steel surfaces.
  2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

#### **2.06 SHOP CONNECTIONS**

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
  1. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

#### **2.07 SHOP PRIMING**

- A. Shop prime steel surfaces except the following:
    1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
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2. Surfaces to be field welded.
  3. Galvanized surfaces.
  4. Machined or milled surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils and an average thickness of 2.0 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
  2. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPCPS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils.

## **2.08 GALVANIZING**

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123.
1. Fill vent and drain holes by plugging with zinc solder and filing off smooth.
  2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

## **2.09 SOURCE QUALITY CONTROL**

- A. Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
  2. AISC Quality-Certified Fabricator: Owner will waive testing and inspection.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.



### 3.03 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
- B. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
  - 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of base plate.
  - 3. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1.
- F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

### 3.04 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened, except slip critical for wind frames and moment connections.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
  - 1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

### 3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
    - 1. Verify structural –steel materials and inspect steel frame joint details.
    - 2. Verify weld materials and inspect welds.
    - 3. Verify connection materials and inspect high-strength bolted connections.
  - B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
  - C. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
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- D. Welded Connections: Field welds will be visually inspected according to AWS D1.1.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

### **3.06 REPAIRS AND PROTECTION**

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
  - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 Sections "Exterior Painting" and "Interior Painting".
- D. Touchup Priming: Cleaning and touchup priming are specified in Division 09 Sections "High Performance Coatings," "Exterior Painting," and "Interior Painting."

**END OF SECTION**



**SECTION 05 5000  
METAL FABRICATIONS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Loose steel lintels.
  - 2. Metal ladders.
  - 3. Steel framing and supports for applications where framing and supports are not specified.

**1.03 COORDINATION**

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Nonslip aggregates and nonslip-aggregate surface finishes.
  - 2. Fasteners.
  - 3. Manufactured metal ladders.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- C. Delegated-Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the jurisdiction in which Project is located.
- B. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research Reports: For post-installed anchors.

**1.06 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
  - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

**1.07 FIELD CONDITIONS**

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.



## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Structural Performance of Aluminum Ladders: Aluminum ladders, including landings, shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

### **2.02 METALS**

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- E. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
  - 1. Size of channels: 1-5/8 by 1-5/8 inches.
  - 2. Material: Cold-rolled steel, ASTM A 1008/A 1008M, commercial steel, Type B; 0.0677-inch minimum thickness; unfinished.
- F. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- G. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- H. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

### **2.03 FASTENERS**

- A. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- B. Provide stainless-steel fasteners for fastening aluminum.
- C. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E 488/M, conducted by a qualified independent testing agency.
- D. Post-Installed Anchors:
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
- E. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1.

### **2.04 MISCELLANEOUS MATERIALS**

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
  - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

### **2.05 FABRICATION, GENERAL**

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.



- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

## **2.06 LOOSE STEEL LINTELS**

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated.
- C. loose lintels to be galvanized in weathered

## **2.07 MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

## **2.08 METAL LADDERS**

- A. General:
    - 1. Comply with ANSI A14.3.
  - B. Steel Ladders:
    - 1. Space siderails 16 inches (406 mm) apart unless otherwise indicated.
    - 2. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
    - 3. Rungs: 3/4-inch- (19-mm-) diameter, steel bars.
    - 4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
    - 5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
-



6. Source Limitations: Obtain nonslip surfaces from single source from single manufacturer.
7. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded or bolted steel brackets.
8. Prime ladders, including brackets and fasteners, with manufacturer's standard primer, compatible with finish coating.

## **2.09 MISCELLANEOUS STEEL TRIM**

- A. Unless otherwise indicated, fabricate units from steel plate and angle support framing. Provide smooth exposed edges. Miter corners at concealed support framing.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Prime miscellaneous steel trim with water-based anti-corrosion primer.

## **2.10 GENERAL FINISH REQUIREMENTS**

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## **2.11 STEEL AND IRON FINISHES**

- A. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean items of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- B. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6 / NACE No. 3, "Commercial Blast Cleaning."
- C. Shop prime iron and steel items.
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

# **PART 3 EXECUTION**

## **3.01 INSTALLATION, GENERAL**

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with the following requirements:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

## **3.02 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturer's written instructions and requirements indicated on Shop Drawings.



### **3.03 ADJUSTING AND CLEANING**

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - a. Apply paint to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

**END OF SECTION**



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**SECTION 05 5100  
METAL STAIRS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Stairs with grating treads and landings.
- B. Structural steel stair framing and supports.
- C. Handrails and guards.
- D. Application: exterior galvanized steel stair at Krieger Elementary School.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling 2021.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- K. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- L. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- M. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates 2015 (Reapproved 2021).
- N. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.
- O. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2021.
- P. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- Q. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2014, with Amendment (2015).



- R. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2021).
- S. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172 2019.
- T. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- U. NAAMM AMP 510 - Metal Stairs Manual 1992.
- V. NAAMM MBG 531 - Metal Bar Grating Manual 2017.
- W. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual 2019.
- X. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
  - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- C. Design Data: As required by authorities having jurisdiction.
- D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is certified under AISC 201.

#### **1.05 QUALITY ASSURANCE**

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.
- C. Fabricator Qualifications:
  - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

### **PART 2 PRODUCTS**

#### **2.01 METAL STAIRS - GENERAL**

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
    - 1. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
    - 2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
    - 3. Structural Design: Provide complete stair and railing assemblies that comply with the applicable local code.
    - 4. Dimensions: As indicated on drawings.
    - 5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
    - 6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
    - 7. Separate dissimilar metals using paint or permanent tape.
  - B. Metal Jointing and Finish Quality Levels:
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1. Service: Exposed joints tight with face surfaces aligned; underside of stair not covered by soffit is not considered exposed to view.
    - a. Welded Joints: Welded on back side wherever possible.
    - b. Welds Exposed to View: Ground smooth; not required to be flush.
    - c. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts or screw threads.
    - d. Metal Surfaces to be Painted: Sanded smooth, suitable for satin or matte finish.
  2. Industrial: All joints made neatly.
    - a. Welded Joints: Welded on back side wherever possible.
    - b. Welds Exposed to Touch: Ground smooth.
    - c. Bolts Exposed to Touch in Travel Area: No nuts or screw threads exposed to touch.
  - C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
  - D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

## **2.02 METAL STAIRS WITH GRATING TREADS**

- A. Jointing and Finish Quality Level: Industrial, as defined above.
- B. Risers: Closed.
- C. Treads: Steel bar grating.
  1. Grating Type: Welded.
  2. Bearing Bar Depth: 3/4 inch, minimum.
  3. Top Surface: Standard.
  4. Nosing: Checkered plate.
  5. Nosing Width: 1-1/4 inch, minimum.
  6. Anchorage to Stringers: Angles welded to grating and stringers.
- D. Stringers: Rolled steel channels.
  1. Stringer Depth: 10 inches.
  2. End Closure: Sheet steel, 14 gauge, 0.075 inch minimum; welded across ends.
- E. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.
- F. Railings: Steel pipe railings.
- G. Finish: Galvanized after fabrication.

## **2.03 HANDRAILS AND GUARDS**

- A. Guards:
    1. Top Rails: Round pipe or tube rails unless otherwise indicated.
      - a. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
    2. Infill at Picket Railings: Vertical pickets.
      - a. Horizontal Spacing: Maximum 4 inches on center.
      - b. Material: Solid steel bar.
      - c. Shape: Round.
      - d. Size: 1/2 inch diameter.
      - e. Top Mounting: Welded to underside of top rail.
      - f. Bottom Mounting: Welded to top surface of stringer.
    3. Infill at Pipe Railings: Pipe or tube rails sloped parallel to stair.
      - a. Outside Diameter: 1-1/4 inch.
      - b. Material: Steel pipe or tube, round.
      - c. Vertical Spacing: Maximum 4 inches on center.
      - d. Jointing: Welded and ground smooth and flush.
    4. End and Intermediate Posts: Same material and size as top rails.
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- a. Horizontal Spacing: 4'-0" on-center maximum.
- b. Mounting: Welded to top surface of stringer.

## **2.04 MATERIALS**

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.
- C. Pipe: ASTM A53/A53M Grade B Schedule 40, galvanized finish.
- D. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230 with G40/Z120 coating.
- E. Checkered Plate: ASTM A786/A786M, rolled steel floor plate; manufacturer's standard pattern.
- F. Gratings: Bar gratings that comply with NAAMM MBG 531 or NAAMM MBG 532, whichever applies based on bar sizes.

## **2.05 ACCESSORIES**

- A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
- B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, and comply with VOC limitations of authorities having jurisdiction.

## **2.06 SHOP FINISHING**

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
  - 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

## **3.02 PREPARATION**

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

## **3.03 INSTALLATION**

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on shop drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

**END OF SECTION**

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**SECTION 06 1053**  
**MISCELLANEOUS ROUGH CARPENTRY****PART 1 GENERAL****1.01 SUMMARY**

- A. Section Includes:
  - 1. Rooftop equipment bases and support curbs.
  - 2. Wood blocking, cants, and nailers.

**1.02 DEFINITIONS**

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater size but less than 5 inches nominal 5 inches nominal (114 mm actual) size in least dimension.
- C. Board Foot: Unit of measure for volume of lumber, equal to 144 cubic inches.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
  - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

**1.04 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

**PART 1 PRODUCTS****2.01 WOOD PRODUCTS, GENERAL**

- A. Lumber: American Softwood Lumber Standard PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
    - 1. Factory mark each piece of lumber with grade stamp of grading agency.
    - 2. Where nominal sizes are indicated, provide actual sizes required by American Softwood Lumber Standard PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
    - 3. Provide dressed lumber, S4S, unless otherwise indicated.
  - B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
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**2.02 WOOD-PRESERVATIVE-TREATED MATERIALS**

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all miscellaneous carpentry, unless otherwise indicated.

**2.03 MISCELLANEOUS LUMBER**

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Cants.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

**2.04 FASTENERS**

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
    - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in areas of high relative humidity, provide fasteners of Type 304 Stainless Steel.
  - B. Nails, Brads, and Staples: ASTM F1667.
  - C. Power-Driven Fasteners: NES NER-272.
  - D. Wood Screws: ASME B18.6.1.
  - E. Screws for Fastening to Metal Framing: ASTM C954, length as recommended by screw manufacturer for material being fastened.
  - F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
  - G. Bolts: Steel bolts complying with ASTM A307, Grade A (ASTM F568M, Property Class 4.6); with ASTM A563 (ASTM A563M) hex nuts and, where indicated, flat washers.
  - H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488/E488M conducted by a qualified independent testing and inspecting agency.
    - 1. Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2 (ASTM F738M and ASTM F836M, Grade A1 or A4).
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**2.05 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

**PART 1 EXECUTION****3.01 INSTALLATION, GENERAL**

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
  - 1. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.
- H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- J. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

**3.02 WOOD BLOCKING, AND NAILER INSTALLATION**

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.



**3.03 PROTECTION**

- A. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

**END OF SECTION**



**SECTION 06 4023**  
**INTERIOR ARCHITECTURAL WOODWORK****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Plastic-laminate cabinets.
  - 2. Plastic-laminate countertops.
  - 3. Window Sills.
  - 4. Interior standing and running trim.

**1.02 DEFINITIONS**

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

**1.03 SUBMITTALS**

- A. Product Data: For high-pressure decorative laminate, adhesive for bonding plastic laminate, cabinet hardware and accessories, handrail brackets, and finishing materials and processes.
  - 1. Include data for fire-retardant materials and treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  - 1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  - 2. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers and other items installed in architectural woodwork.
- C. Samples for Verification:
  - 1. Lumber with transparent finish, not less than 1-1/2 inches wide by 4 inches long, for each species and cut, finished on 1 side and 1 edge.
  - 2. Plastic laminates, 2 by 3 inches, for each type, color, pattern, and surface finish.
  - 3. Solid-surfacing materials, 2 by 3 inches square.
- D. Product Certificates: For each type of product, signed by product manufacturer.
- E. Qualification Data: For fabricator.

**1.04 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
  - B. Installer Qualifications: Fabricator of products.
  - C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers.
  - D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
-



- E. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.
- F. Forest Certification: Provide interior architectural woodwork produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

### **1.06 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
  - 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

### **1.07 COORDINATION**

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Products: Comply with the following:
  - 1. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
  - 2. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.
  - 3. Marine Grade Panel Products (Marine Plywood):
- C. Thermoset Decorative Panels: Particleboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
  - 1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semi-exposed edges.
- D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.



- 
1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
    - a. Formica Corporation.
    - b. Lamin-Art, Inc.
    - c. Nevamar Company, LLC; Decorative Products Div.
    - d. Panolam Industries International Incorporated.
    - e. Westinghouse Electric Corp.; Specialty Products Div.
    - f. Wilsonart International; Div. of Premark International, Inc.
  - E. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Avonite, Inc.
      - b. Silestone - Quartz
      - c. I. du Pont de Nemours and Company.
      - d. Formica Corporation.
      - e. Nevamar Company, LLC; Decorative Products Div.
      - f. Swan Corporation (The).
      - g. Wilsonart International; Div. of Premark International, Inc.
    2. Type: Standard type, unless Special Purpose type is indicated.
  - F. Colors and Patterns: As selected by Architect from manufacturer's full range of standard colors.

## 2.02 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
    1. Use treated materials that comply with requirements of referenced woodworking standard. Do not use materials that are warped, discolored, or otherwise defective.
    2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
    3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.
  - B. Fire-Retardant Particleboard: Panels complying with the following requirements, made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E 84.
    1. For panels 3/4 inch thick and less, comply with ANSI A208.1 for Grade M-2 except for the following minimum properties: modulus of rupture, 1600 psi; modulus of elasticity, 300,000 psi; internal bond, 80 psi; and screw-holding capacity on face and edge, 250 and 225 lbf, respectively.
    2. For panels 13/16 to 1-1/4 inches thick, comply with ANSI A208.1 for Grade M-1 except for the following minimum properties: modulus of rupture, 1300 psi; modulus of elasticity, 250,000 psi; linear expansion, 0.50 percent; and screw-holding capacity on face and edge, 250 and 175 lbf, respectively.
    3. Products: Subject to compliance with requirements, provide one of the following:
      - a. Flakeboard Company Limited; Duraflake FR.
      - b. SierraPine; Encore FR.
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**2.03 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS**

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
  - 1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. Grade: Premium.
- C. Type of Construction: Frameless.
- D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
- F. Laminate Cladding for Exposed Surfaces:
  - 1. Horizontal Surfaces: Grade HGS.
  - 2. Vertical Surfaces: Grade HGS.
  - 3. Edges: PVC edge banding, 3mm thick, matching laminate in color, pattern, and finish.
- G. Materials for Semi-exposed Surfaces:
  - 1. Surfaces Other Than Drawer Bodies: Thermoset decorative panels.
    - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3mm thick, matching laminate in color, pattern, and finish.
- H. Drawer Construction: Fabricate with exposed fronts fastened to sub-front with mounting screws from interior of body.
  - 1. Join sub-fronts, backs, and sides with dovetail joints supplemented by mechanical fasteners or glued and doweled joints.

**2.04 SOLID-SURFACE-MATERIAL WINDOW SILLS**

- A. Window sills: solid surface material, thickness as indicated.
- B. Fabrication: Fabricate sills in one piece. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

**2.05 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH**

- A. Grade: Premium.
- B. Wood Species and Cut:
  - 1. Species: White Maple.
  - 2. Cut: Plain sliced/plain sawn.
  - 3. Provide split species on trim that faces areas with different wood species, matching each face of woodwork to species and cut of finish wood surfaces in areas finished.
- C. For base wider than available lumber, glue for width. Do not use veneered construction.

**2.06 CABINET HARDWARE AND ACCESSORIES**

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.
  - B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 degrees of opening, self-closing.
  - C. Steel Angle Brackets: For counter support.
    - 1. Manufacturer: Doug Mockett
    - 2. Model: Size: 18", 24" and 30" as indicated on the drawings.
    - 3. Finish: Satin Stainless
  - D. Spring Loaded Folding Bracket:
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1. Manufacturer: Sugatsune
  2. Models:
    - a. 38830-25
    - b. 38845-25
    - c. 38860-25
  3. Finish: Anodized Aluminum
- E. Back-Mounted Pulls: BHMA A156.9, B02011.
- F. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- G. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081 and BHMA A156.9, B04102; with shelf brackets, B04112.
1. Manufacturer: Knappe and Vogt
  2. Install recessed into the millwork.
- H. Drawer Slides: BHMA A156.9, B05091.
1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.
  2. Box Drawer Slides: Grade 1HD-100; for drawers not more than 6 inches high and 24 inches wide.
  3. File Drawer Slides: Grade 1HD-200; for drawers more than 6 inches high or 24 inches wide.
  4. Pencil Drawer Slides: Grade 1; for drawers not more than 3 inches high and 24 inches wide.
  5. Keyboard Slides: Grade 1HD-100; for computer keyboard shelves.
  6. Trash Bin Slides: Grade 1HD-200; for trash bins not more than 20 inches high and 16 inches wide.
- I. Door Locks: BHMA A156.11, E07121.
- J. Drawer Locks: BHMA A156.11, E07041.
- K. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
- L. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
  2. Satin Stainless Steel: BHMA 630.
- M. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

## 2.07 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
  - B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
  - C. Handrail Brackets: Cast from aluminum with wall flange drilled and tapped for concealed hanger bolt and with support arm for screwing to underside of rail. Sized to provide 1-1/2-inch clearance between handrail and wall.
  - D. Handrail/Bumper Rail Brackets: Pairs of extruded-aluminum channels; one for fastening to back of rail and one for fastening to face of wall. They are then assembled in overlapping fashion and fastened together top and bottom with self-tapping screws. Sized to provide 1-1/2-inch clearance between handrail and wall.
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- E. Adhesives, General: Do not use adhesives that contain urea formaldehyde.
- F. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Wood Glues: 30 g/L.
  - 2. Contact Adhesive: 250 g/L.
- G. Adhesive for Bonding Plastic Laminate: Contact cement.
  - 1. Use un-pigmented contact cement with through-color laminate.

## 2.08 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- B. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
  - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.
- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
- F. Seal edges of openings in countertops with a coat of varnish.

## 2.09 SHOP FINISHING

- A. General: Shop finish transparent-finished interior architectural woodwork at fabrication shop as specified in this Section. Refer to Division 09 painting Sections for finishing opaque-finished architectural woodwork.
- B. Shop Priming: Shop apply the prime coat including backpriming for items specified to be field finished. Refer to Division 09 painting Sections for material and application requirements.
- C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
  - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.
- D. Transparent Finish:
  - 1. Grade: Premium.
  - 2. AWI Finish System: Conversion varnish.
  - 3. Staining: Match approved sample for color.
  - 4. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
  - 5. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.



**PART 3 EXECUTION****3.01 PREPARATION**

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

**3.02 INSTALLATION**

- A. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
  - B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
  - C. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
  - D. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
  - E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
  - F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible.
    - 1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
    - 2. Install wall railings on indicated metal brackets securely fastened to wall framing.
    - 3. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.
  - G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
    - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
    - 2. Maintain veneer sequence matching of cabinets with transparent finish.
    - 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c.
      - a. Use No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
      - b. Use No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
  - H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
    - 1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
    - 2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
    - 3. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
-



4. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."
- I. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
- J. Refer to Division 09 Sections for final finishing of installed architectural woodwork not indicated to be shop finished.

### **3.03 STANDING AND RUNNING TRIM INSTALLATION**

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
  1. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
  2. Install trim after gypsum-board joint finishing operations are completed.
  3. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

### **3.04 ADJUSTING AND CLEANING**

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork and casework on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

### **END OF SECTION**



**SECTION 06 6500  
SIMULATED WOOD TRIM**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Cellular PVC trim boards (eaves, etc.) and sheets (soffits, etc.).

**1.03 PERFORMANCE REQUIREMENTS**

A. REFERENCES

1. ASTM D792 - Density and Specific Gravity of Plastics by Displacement.
2. ASTM D570 - Water Absorption of Plastics.
3. ASTM D638 - Tensile Properties of Plastics.
4. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
5. ASTM D1761 - Mechanical Fasteners in Wood.
6. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by means of a Striker Impacted by a Falling Weight.
7. ASTM D256 - Determining the Pendulum Impact Resistance of Plastics.
8. ASTM D696 - Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous silica Dilatometer.
9. ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
10. ASTM E84 - Surface Burning Characteristics of Building Materials.
11. ASTM D648 - Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
12. ASTM D3679 – Standard Specification for Rigid Poly Vinyl Chloride (PVC) Siding.

**1.04 SUBMITTALS**

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation instructions and methods.
  4. Code compliance reports.
- B. Samples: Submit two samples of each product specified, minimum 6 inches long, representing actual product, color and finish.
- C. Operation and Maintenance Data: For plastic fabrications to include in operation and maintenance manuals.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Manufacturer with a minimum of 15 years producing PVC trim products.
  - B. Installer Qualifications: Installer with a minimum of 3 years' experience with the installation of PVC trim products.
  - C. Regulatory Requirements: Comply with all applicable building codes.
  - D. Allowable Tolerances:
    1. Variation in component length: -0.00 / +1.00"
    2. Variation in component width:  $\pm 1/16$ "
    3. Variation in component thickness:  $\pm 1/16$ "
    4. Variation in component edge cut:  $\pm 2^\circ$
-



- 5. Variation in Density: -0% + 10%
- E. Workmanship, Finish and Appearance:
  - 1. Free foam cellular PVC that is homogeneous and free of voids, holes, cracks and foreign inclusions and other defects. Edges must be square, and top and bottom surfaces shall be flat with no convex or concave deviation.
  - 2. Uniform surface free from cupping, warping, and twisting.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Materials should be stored on a flat and level surface on a full shipping pallet. Handle materials to prevent damage to product edges and corners. Store materials under a protective covering.

## **1.07 WARRANTY**

- A. Provide manufacturer's Limited Lifetime warranty against defects in manufacturing that cause the products to rot, corrode, delaminate, or excessively swell from moisture.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. The AZEK Company, which is located at: 888 N Keyser Ave, Scranton, PA 18508.

### **2.02 PLASTIC FABRICATIONS**

- A. Material: Free foam cellular PVC material with a small-cell microstructure and density of 0.55 grams/cm<sup>3</sup>.
- B. Physical and Performance Properties:

### **2.03 ACCESSORY PRODUCTS**

- A. Fasteners:
  - 1. Use fasteners designed for wood trim and wood siding (thinner shank, blunt point, full round head).
  - 2. Fasteners shall be stainless steel.
  - 3. Staples, small brads and wire nails shall not be used as fastening members.
  - 4. The fasteners shall be long enough to penetrate the solid wood substrate a minimum of 1 1/2".
  - 6. Cellular PVC trimboards shall be fastened into a flat, solid substrate.
- B. Adhesives:
  - 1. Glue all joints with a cellular PVC cement to prevent joint separation.
  - 2. The glue joint shall be secured with a fastener and/or fastened on each side of the joint to allow adequate bonding time.
  - 3. Surfaces to be glued shall be smooth, clean and in complete contact with each other.
  - 4. To bond cellular PVC to other substrates, various adhesives may be used. Consult adhesive manufacturer to determine suitability.
- C. Sealants:
  - 1. Use urethane, polyurethane or acrylic based sealants without silicone.

### **2.04 FINISHES**

- A. Prefinished color to be white. Engineered to be painted.
- B. Tradition (Smooth) finish.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Manufacturer's Instructions:
    - 1. Comply with manufacturer's written installation instructions.
-



- B. Cutting:
  - 1. Cut cellular pvc products using the same tools used to cut lumber (carbide tipped blades designed to cut wood work well. Avoid fine tooth metal cutting blades).
- C. Drilling:
  - 1. Drill cellular pvc products using the same tools used to drill lumber.
  - 2. Use standard woodworking drills. Do not use drills made for normal rigid pvc.
  - 3. Periodic removal of cellular pvc shavings from the drill hole may be necessary.
- D. Milling:
  - 1. Cellular pvc products can be milled using standard milling machines used to mill lumber.
  - 2. Relief Angle 20° to 30°.
  - 3. Cutting speed to be optimized with the number of knives and feed rate.
- E. Routing:
  - 1. Cellular pvc products can be routed using standard router bits and the same tools used to rout lumber.
  - 2. Carbide tipped router bits are recommended.
- F. Edge Finishing:
  - 1. Finish edges by sanding, grinding or filing with traditional woodworking tools.
- G. Fastener Location:
  - 1. Use 2 fasteners at 16" O.C. for cellular pvc trimboard applications.
  - 2. Fasteners shall be installed no more than 2" from the end of each board.
  - 3. Provide fasteners per cellular pvc manufacturer's written instructions
- H. Thermal Expansion and Contraction:
  - 1. Cellular pvc products expand and contract with changes in temperature.
  - 2. Allow for 1/8" per 18 foot of cellular pvc product for expansion and contraction.
  - 3. Joints between pieces of cellular pvc shall be glued to eliminate joint separation. When gaps are glued on a long run of cellular pvc, allow expansion and contraction at ends of the run.
  - 4. Install cellular pvc per manufacturer's written instructions so as to allow for thermal expansion and contraction.

**END OF SECTION**



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**SECTION 07 0150.19  
PREPARATION FOR RE-ROOFING****PART 1 GENERAL****1.01 SUMMARY**

- A. Section Includes:
  - 1. Roof replacement preparation consisting of full roof tear-off of roof system at designated roof areas.
  - 2. Roof rehabilitation preparation of roof system at designated roof areas.
  - 3. Removal of flashings and counterflashings.
  - 4. Temporary roofing.
  - 5. Removal and reinstallation of indicated components, accessories, and equipment.
- B. Related Information:
  - 1. Division 07 Section "Rehabilitation of Single Ply Roofing " for roof rehabilitation requirements.
  - 2. Division 07 Section "Sheet Metal Flashing and Trim" for formed metal roof flashings and counterflashings.

**1.02 DESCRIPTION OF WORK**

- A. Re-roofing preparation Work consists of the following:
  - 1. Preparation for Roof Areas 2-5:
    - a. Preparation for: Roof rehabilitation.
    - b. Existing Roof Type: Adhered single ply.
    - c. Existing Deck Type: Concrete deck.
    - d. Removal and reinstallation of indicated components, accessories, and equipment.
    - e. Removal of base flashings.
    - f. Temporary roof membrane.
  - 2. Preparation for Roof Area: Roof area 1:
    - a. Preparation for: Roof replacement.
    - b. Existing Roof Type: Adhered single ply.
    - c. Existing Deck Type: Concrete deck.
    - d. Roof tear-off.
    - e. Removal and reinstallation of indicated components, accessories, and equipment.
    - f. Uplift securement.
    - g. Removal of base flashings.
    - h. Temporary roof membrane.

**1.03 MATERIALS OWNERSHIP**

- A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

**1.04 DEFINITIONS**

- A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.
  - B. Existing Roofing System: Roofing system identified above, including roof covering/membrane, roof insulation, surfacing, and components and accessories between deck and roof covering/membrane.
  - C. Roof Re-Cover Preparation: Existing roofing membrane that is to remain and be prepared for reuse or rehabilitation.
  - D. Full Roof Tear-Off: Removal of existing membrane roofing system from deck.
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- E. Partial Roof Tear-Off: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system.
  - F. Roof Re-Cover Preparation: Existing roofing membrane that is to remain and be prepared for installation of new roofing system over existing system.
  - G. Roof Rehabilitation Preparation: Existing roofing membrane that is to remain and be prepared for rehabilitation.
  - H. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
  - I. Existing to Remain: Existing items of construction that are not indicated to be removed.
  - J. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
  - K. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
  - L. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
  - M. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
  - N. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
  - O. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

#### **1.05 PREINSTALLATION MEETINGS**

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
  - 1. Coordinate with roofing preinstallation meetings specified in Division 07 roofing section(s).
  - 2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
    - a. Reroofing preparation, including roofing system manufacturer's written instructions.
    - b. Temporary protection requirements for existing roofing system components that are to remain.
    - c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
    - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
    - e. Existing roof deck conditions requiring Architect notification.
    - f. Existing roof deck removal procedures and Owner notifications.
    - g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
    - h. Structural loading limitations of roof deck during reroofing.
    - i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
    - j. HVAC shutdown and sealing of air intakes.
    - k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
    - l. Asbestos removal and discovery of asbestos-containing materials.
    - m. Governing regulations and requirements for insurance and certificates if applicable.
    - n. Existing conditions that may require Architect notification before proceeding.

#### **1.06 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
-



**1.07 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer for refrigerant recovery technician.
- B. Digital Images or Videos: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.
- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- D. Schedule of Re-Roofing Preparation Activities: Indicate the following:
  - 1. Detailed sequence of re-roofing preparation work, with starting and ending dates for each activity. Ensure occupants' on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs.
  - 5. Coordination of Owner's continuing occupancy of portions of existing building.
- E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

**1.08 CLOSEOUT SUBMITTALS****1.09 QUALITY ASSURANCE**

- A. Installer Qualifications: Installer of new membrane roofing system.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements:
  - 1. Comply with governing EPA notification regulations before beginning membrane roofing removal.
  - 2. Comply with hauling and disposal regulations of authorities having jurisdiction.

**1.10 PROJECT / FIELD CONDITIONS**

- A. Owner will occupy portions of building immediately below reroofing area.
    - 1. Conduct reroofing so Owner's operations will not be disrupted.
    - 2. Provide Owner with not less than 48 hours' written notice of activities that may affect Owner's operations.
    - 3. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below the work area.
  - B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
  - C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
  - D. Limit construction loads on roof to rooftop equipment wheel loads and uniformly distributed loads not exceeding recommendations of Contractor's professional engineer based upon site inspection and analysis.
  - E. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
    - 1. Remove only as much roofing in one day as can be made watertight in the same day.
-



- F. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
- G. Hazardous Materials: It is not expected that hazardous materials such as asbestos-containing materials will be encountered in the Work.
  - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
    - a. Obtain direction from Architect before proceeding with work in the affected area.

## **PART 1 PRODUCTS**

### **2.01 TEMPORARY PROTECTION MATERIALS**

- A. EPS Insulation: Molded (expanded) polystyrene, ASTM C578.
- B. Plywood: NIST DOC PS 1, Grade CD, Exposure 1.
- C. Oriented Strand Board (OSB): NIST DOC PS 2, Exposure 1.

### **2.02 DECK REPAIR/REPLACEMENT MATERIALS**

- A. Concrete Deck Repair Materials:
  - 1. Bonding Agent: Epoxy-modified, cementitious bonding and anticorrosion agent consisting of water-insensitive epoxy adhesive, portland cement, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.
  - 2. Patching Mortar: Trowelable cementitious repair mortar for vertical and overhead, repairs up to 2 inches (50 mm) per lift, one component, fiber reinforced, polymer modified repair mortar containing corrosion inhibitor.
    - a. Compressive Strength: Not less than 6000 psi (41400 kPa) at 28 days when tested according to ASTM C 109/C 109M, modified 2-inch (50-mm) cubes.
- B. Wood Components:
  - 1. Wood Blocking, Curbs, Cants and Nailers: Specified in Division 06 Section "Miscellaneous Rough Carpentry."
  - 2. Reuse existing wood components that exhibit no signs of deterioration or other conditions detrimental to securement of new roofing system in conformance with specified requirements.

### **2.03 ROOFING INFILL AND REPLACEMENT MATERIALS**

- A. Use roofing infill materials matching existing membrane roofing system materials unless otherwise indicated.
- B. Wood Blocking, Curbs, Cants and Nailers: Specified in Division 06 Section "Miscellaneous Rough Carpentry."
- C. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

### **2.04 TEMPORARY ROOFING MATERIALS**

- A. Design and selection of materials for temporary roofing are responsibilities of Contractor.

### **2.05 TEMPORARY ROOF DRAINAGE**

- A. Design and selection of materials for temporary roof drainage are responsibilities of the Contractor.

### **2.06 AUXILIARY RE-ROOFING MATERIALS**

- A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new membrane roofing system.



- B. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

## **PART 1 EXECUTION**

### **3.01 PREPARATION, GENERAL**

- A. Protection of In-Place Conditions: Protect existing roofing system that is indicated not to be reroofed.
1. Loosely lay 1-inch- (25-mm-) minimum thick, molded expanded polystyrene (EPS) insulation over the roofing membrane in areas indicated.
    - a. Loosely lay 15/32-inch (12-mm) plywood or OSB panels over EPS. Extend EPS past edges of plywood or OSB panels a minimum of 1 inch (25 mm).
  2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
  3. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
  4. Comply with requirements of existing roof system manufacturer's warranty requirements.
- B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- C. Shut off rooftop utilities and service piping before beginning the Work.
- D. Test existing roof drains to verify that they are not blocked or restricted.
1. Immediately notify Architect of any blockages or restrictions.
- E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- F. Pollution Control: Comply with environmental regulations of authorities having jurisdiction. Limit spread of dust and debris.
1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  2. Remove debris from building roof by chute, hoist, or other device that will convey debris to grade level.
- G. Refrigerant: Before starting re-roofing preparation, remove refrigerant from mechanical equipment to be removed and reinstalled, according to 40 CFR 82 and regulations of authorities having jurisdiction.
- H. Temporary Weather Protection: During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- I. Roof Drain Protection: Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.
  2. Prevent debris from entering or blocking roof drains and conductors.
    - a. Use roof-drain plugs specifically designed for this purpose.
    - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
  3. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding.



- a. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

### **3.02 ROOF TEAR-OFF**

- A. Notify Owner each day of extent of roof tear-off proposed for that day.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Roof Drainage: Remove roof drainage items indicated for removal.
- D. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.
  - 1. Remove cover boards and roof insulation.
- E. Partial Roof Tear-Off: Remove existing roofing membrane and immediately check for presence of moisture by visually observing cover boards and roof insulation that will remain.
  - 1. Coordinate with Owner's inspector to schedule times for tests and inspections immediately after membrane removal.
  - 2. Remove wet or damp boards and roof insulation. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
- F. Roof Edge Specialties: Replace existing perimeter metal systems with new perimeter metal systems.
  - 1. New perimeter metal systems (fascia and coping) are specified in Division 07 Section "Sheet Metal Flashing and Trim."
- G. Inspect wood blocking, curbs, and nailers for deterioration and damage.
  - 1. Replace existing wood components that exhibit signs of deterioration or other conditions detrimental to securement of roofing system components, including roof edge flashings.
  - 2. Reuse of Existing Wood Nailers: Permitted where type, size and securement are in accordance with Factory Mutual Loss Prevention Data Bulletin 1-49; and existing wood nailers exhibit no signs of deterioration or other conditions detrimental to securement of new roofing system in conformance with specified requirements.

### **3.03 DECK PREPARATION**

- A. Inspect deck after tear-off of membrane roofing system.
- B. Verify that deck is sound and dry.
- C. Unsuitable Deck: If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

### **3.04 DECK REPAIR/REPLACEMENT**

- A. Repair existing deck to provide smooth working surface for installation of roof system.
  - 1. Replace deck that cannot be repaired to sound condition.

### **3.05 INFILL AND REPLACEMENT MATERIALS INSTALLATION**

- A. Immediately after removal of selected portions of existing membrane roofing system, and inspection and repair, if needed, of deck, fill in the tear-off areas to match existing membrane roofing system construction.

### **3.06 EQUIPMENT REMOVAL AND REINSTALLATION**

- A. General: Remove, store, protect and reinstall rooftop equipment as required to accommodate roof tear-off and subsequent roofing work.
    - 1. Raise roof curbs, equipment mountings and other roof penetration flashings as required to accommodate additional insulation thickness and maintain base flashing height of not less than 8 inches (200 mm), unless otherwise indicated.
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- a. Provide wood assemblies and additional support with miscellaneous galvanized steel angles, as required to rebuild or raise existing roof curbs.
    - b. Extend vent and soil stacks and other roof penetrations, using matching materials, as required to accommodate additional insulation thickness.
  2. Extend existing ductwork inside existing roof curbs to accommodate extension of curb.
    - a. Use materials matching existing ductwork; minimum of 20 ga. (0.9 mm) galvanized duct with Pittsburgh folded seam slip joints-typical.
- B. Rooftop Equipment, Electrical: Engage a qualified electrician to perform electrical disconnection and reconnection.
  1. Disconnect, reroute, extend and reconnect existing power feeders and control circuits (conduit and wiring) feeding the existing roof mounted equipment which is indicated to be raised and/or relocated to a new elevation/location and as required by the Contract.
  2. Provide weatherproof exterior junction boxes, when required.
  3. Make connections to mechanical equipment by using a maximum 18-inch (450-mm) length of liquid-tight flexible steel conduit.
    - a. Rigid connections to mechanical equipment are not permitted.
  4. Relocate and reconnect existing disconnect switches presently installed on existing roof mounted equipment indicated to be raised and/or relocated.
- C. Prevent discharge of refrigerant. Verify that refrigerant has been properly recovered from equipment to be removed.
- D. Reinstall designated equipment.
  1. Make electrical reconnections in accordance with applicable code and authorities having jurisdiction.
  2. Recharge HVAC equipment with refrigerant required by equipment manufacturer.
  3. Coordinate with Owner to test equipment and verify proper operation.
  4. Notify Owner to have lightning protection system inspected and recertified after reinstallation.
- E. Remove and dispose of designated abandoned equipment. Infill openings in deck with matching materials. Infill roofing system with materials of same type as existing, adjacent roofing system.

### **3.07 TEMPORARY ROOFING MEMBRANE**

- A. Install approved temporary roofing membrane over area to be reroofed.
- B. Remove temporary roofing membrane before installing new roofing membrane.

### **3.08 ROOF REHABILITATION PREPARATION**

- A. Prepare existing roofing as specified Division 07 Section "Rehabilitation of Single Ply Roofing".

### **3.09 BASE FLASHING REMOVAL**

- A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
  1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain.
  1. Replace metal counterflashings damaged during removal with counterflashings specified in Division 07 Section "Sheet Metal Flashing and Trim."

### **3.10 DISPOSAL**

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
    1. Storage or sale of demolished items or materials on-site is not permitted.
  - B. Transport and legally dispose of demolished materials off Owner's property.
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**3.11 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by preparation for re-roofing operations. Return adjacent areas to condition existing before operations began.

**END OF SECTION**



**SECTION 07 0150.74**  
**REHABILITATION OF SINGLE PLY ROOFING****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Roof membrane coating preparation.
  - 2. Application of reinforced fluid-applied roof membrane and flashings over existing fully adhered EPDM membrane roof.
- B. Related Information:
  - 1. Division 07 Section "Preparation for Re-Roofing" for existing roofing tear-off, patching, and substrate preparation for rehabilitation of roofing membrane.
  - 2. Division 07 Section "Sheet Metal Flashing and Trim" for formed metal roof flashings and counterflashings.

**1.02 ROOFING CONFERENCES**

- A. Roofing Rehabilitation Preinstallation Conference: Conduct conference at Project site to review methods and procedures related to roofing system.
  - 1. Meet with Owner; Architect; roofing coating materials manufacturer's representative; roofing rehabilitation Installer including project manager and foreman; and installers whose work interfaces with or affects rehabilitation including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
  - 2. Review temporary protection requirements for existing roofing system that is to remain uncoated, during and after installation.
  - 3. Review methods and procedures related to re-coating preparation, including coating manufacturer's written instructions.
  - 4. Review roof drainage during each stage of coating and review roof drain plugging and plug removal procedures.
  - 5. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 6. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect coating.
  - 7. Review HVAC shutdown and sealing of air intakes.
  - 8. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
  - 9. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.
  - 10. Review governing regulations and requirements for insurance and certificates if applicable.
  - 11. Review existing conditions that may require notification of Owner before proceeding.

**1.03 MATERIALS OWNERSHIP**

- A. Demolished materials shall become Contractor's property and shall be removed from Project site.

**1.04 DEFINITIONS**

- A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.
  - B. Roofing Coating Preparation: Existing roofing that is to remain and be prepared to accept restorative coating application.
  - C. Patching: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system and replacement with similar materials.
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- D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
- E. Existing to Remain: Existing items of construction that are not indicated to be removed.

**1.05 ACTION SUBMITTALS**

- A. Product Data: For each type of product specified.
- B. Sustainable Design Submittals:
  - 1. Product Test Reports: For roof coating, indicating that coated roof will comply with solar reflectance index requirement.

**1.06 INFORMATIONAL SUBMITTALS**

- A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
  - 1. Provide manufacturer's UL listing certificate for roofing system.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing rehabilitation system.
- C. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
  - 1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.
- D. Warranties: Unexecuted sample copies of special warranties.
- E. Photographs or Video Recordings: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by rehabilitation operations. Submit before Work begins.
- F. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, and for dust control. Indicate proposed locations and construction of barriers.
- G. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.
  - 1. Submit report within 48 hours after inspection.

**1.07 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: To include in maintenance manuals.
- B. Warranties: Executed copies of approved warranty forms.

**1.08 QUALITY ASSURANCE**

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of three years' experience installing products similar to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:
  - 1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
- B. Manufacturer Qualifications: Primary product manufacturer that is UL listed for roofing system identical to that specified for this Project with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.



- C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.
  2. An independent party certified as a Registered Roof Observer by the International Institute of Building Enclosure Consultants (formerly the Roof Consultants Institute) retained by the Contractor or the Manufacturer and approved by the Manufacturer.

### **1.09 FIELD CONDITIONS**

- A. Weather Limitations: Proceed with rehabilitation work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.
1. Store all materials prior to application at temperatures recommended by manufacturer.
  2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer.
  3. Do not apply roofing in snow, rain, fog, or mist.
- B. Protect building to be rehabilitated, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from rehabilitation operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
- E. Owner will occupy portions of building immediately below re-coating area. Conduct re-coating so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

### **1.10 WARRANTY**

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
1. Form of Warranty: Manufacturer's standard warranty form.
  2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
  3. Warranty Period: 20 years from date of completion.
- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
  2. Scope of Warranty: Work of this Section.
  3. Warranty Period: 2 years from date of completion.

## **PART 1 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, [www.tremcoroofing.com](http://www.tremcoroofing.com) that are named in other Part 2 articles. Provide specified products.
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- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

## **2.02 PERFORMANCE REQUIREMENTS**

- A. General Performance: Rehabilitated roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.
1. Accelerated Weathering: Roofing system shall withstand 5000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Exterior Fire-Test Exposure: Roofing system exterior fire-test exposure performance following application of rehabilitation coating shall be not be less than that of the prerehabilitated roof performance when tested in accordance with ASTM E108, based upon manufacturer's tests of identical applications.

## **2.03 MATERIALS, GENERAL**

- A. General: Rehabilitation materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.
- B. Infill Materials: Where required to replace test cores and to patch existing roofing, use infill materials matching existing membrane roofing system materials, unless otherwise indicated.
- C. Temporary Roof Drainage: Design and selection of materials for temporary roof drainage are responsibilities of the Contractor.

## **2.04 FLUID-APPLIED ROOFING MEMBRANE COATING**

- A. Polyurethane Elastomeric Fluid-Applied System: Two-coat fluid-applied roofing membrane formulated for application over prepared existing roofing substrate.
1. Polyurethane Roof Coating System Base Coat: Bio-based, low-odor low-VOC two-part, for use with a compatible top coat.
    - a. Basis of design product: Tremco, AlphaGuard BIO Base Coat.
    - b. Combustion Characteristics, UL 790: Maintains combustion characteristics of existing roof system.
    - c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 1 g/L.
    - d. Accelerated Weathering, 5000 hours, ASTM G154: Pass.
    - e. Hardness, Shore A, minimum, ASTM D2240: 80.
    - f. Solids, by volume, ASTM D2697: 100 percent.
    - g. Bio-Based Content, Minimum: 70 percent.
    - h. Minimum Thickness, Base Coat non-reinforced over Smooth BUR, MB, Concrete, Single-Ply: 32 mils (0.81 mm) wet.
  2. Polyurethane roof coating system top coat, bio-based low-odor low-VOC two-part, for application over compatible base coat.
    - a. Basis of design product: Tremco, AlphaGuard BIO Top Coat.
    - b. Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system.
    - c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 6 g/L.
    - d. Solar Reflectance Index (SRI), ASTM E1980: For white, not less than 103.
    - e. Accelerated Weathering, 5000 hours, ASTM G 154: Pass.
    - f. Hardness, Shore A, minimum, ASTM D2240: 81.
    - g. Solids, by volume, ASTM D2697: 100 percent.
    - h. Bio-Based Content, Minimum: 60 percent.
    - i. Minimum Thickness, reinforced system: 32 mils (0.81 mm) wet.
    - j. Minimum Thickness, Slip-Resistant Coat: 24 mils (0.60 mm) wet.



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- k. Color: White.
  - B. Primers:
    - 1. Primer for Asphaltic and Single-Ply Membranes: Water-based, polymer-modified quick-dry low odor primer.
      - a. Basis of design product: Tremco, AlphaGuard WB Primer.
      - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 1 g/L.
      - c. Solids, by weight: 70 percent.
  - C. Fluid-Applied Roofing Reinforcing Fabric:
    - 1. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.
      - a. Basis of design product: Tremco, Permafab.
      - b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..
      - c. Elongation, Minimum, ASTM D1682: 60 percent.
      - d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
      - e. Weight: 3 oz./sq. yd (102 g/sq. m).

## 2.05 AUXILIARY ROOFING REHABILITATION MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system and roofing coating system.
  - B. Seam Sealer: Waterproof seam and patching material compatible with applied coating.
    - 1. Seam Sealer: Aromatic polyurethane sealer, single-component, high solids, moisture curing, formulated for compatibility and use with a variety of roofing and flashing substrates.
      - a. Basis of design product: Tremco, GEOGARD Seam Sealer.
      - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 189 g/L.
      - c. Tensile Strength, ASTM D412: 270 psi (1860 kPa).
      - d. Tear Strength, ASTM D412: 35 pli (6.13 kNm).
      - e. Elongation, ASTM D412: 220 percent.
      - f. Color: Gray.
  - C. Seam and Detail Reinforcing Fabric:
    - 1. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.
      - a. Basis of design product: Tremco, Permafab.
      - b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..
      - c. Elongation, Minimum, ASTM D1682: 60 percent.
      - d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
      - e. Weight: 3 oz./sq. yd (102 g/sq. m).
  - D. Joint Sealant: Elastomeric joint sealant compatible with applied coating, with movement capability appropriate for application.
    - 1. Joint Sealant, Polyurethane: ASTM C920, Type S, Grade NS, Class 50 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints; paintable.
      - a. Basis of design product: Tremco, TremSEAL Pro.
      - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 40 g/L.
      - c. Hardness, Shore A, ASTM C661: 40.
      - d. Adhesion to Concrete, ASTM C794: 35 pli.
      - e. Tensile Strength, ASTM D412: 350 psi (2410 kPa).
      - f. Color: Closest match to substrate.
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- E. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

## **2.06 WALKWAYS**

- A. Slip Resistant Product for Fluid-Applied Walkways:
1. Aggregate, Slip Resistant Silica Sand: Silica sand, broadcast into fluid-applied roof coating products for use as aggregate fill for slip-resistant, abrasion-resistant coating applications.
    - a. Basis of design product: Aggregate, Slip Resistant Silica Sand.
    - b. Size: 20 - 40 mesh.
    - c. Application Rate: Minimum 20 lb/100 sq ft (1 k/m<sup>2</sup>).

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine existing roofing substrates, with Installer present, for compliance with requirements and for other conditions affecting application and performance of roof coatings
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
  2. Verify compatibility with and suitability of substrates.
  3. Verify that substrates are visibly dry and free of moisture.
  4. Verify that roofing membrane surfaces have adequately aged to enable proper bond with base coat.
  5. Verify that roofing membrane is free of blisters, splits, open laps, indications of shrinkage, and puncture damage or other indications of impending roof system failure.
  6. Commencing application of coatings indicates acceptance of surfaces and conditions.

### **3.02 PREPARATION**

- A. Protect existing roofing system that is indicated not to be rehabilitated, and adjacent portions of building and building equipment.
1. Mask surfaces to be protected. Seal joints subject to infiltration by coating materials.
  2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
  3. Maintain temporary protection and leave in place until replacement roofing has been completed.
- B. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with coating work that could affect indoor air quality or activate smoke detectors in the ductwork.
1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.
- C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
1. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

### **3.03 ROOFING COATING PREPARATION**

- A. Removal of Wet Insulation: Remove portions of roofing membrane with underlying wet insulation. Remove wet insulation, fill in tear-off areas to match existing insulation and membrane, and prepare patched membrane for application of roof coating as specified below.
- B. Repair of Ponding Areas: Repair areas indicated as ponding areas or areas of inadequate drainage by removing roof membrane, adding additional insulation as required to provide minimum slopes to drain required by roofing rehabilitation coating manufacturer, and replace membrane with material matching existing. Submit photographic report indicating compliance.
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- C. Membrane Surface Preparation:
  - 1. Remove blisters, ridges, buckles, roofing membrane fastener buttons projecting above the membrane, and other substrate irregularities from existing roofing membrane that would inhibit application of uniform, waterproof coating.
  - 2. Broom clean existing substrate.
  - 3. Substrate Cleaning: Clean substrate of contaminants such as dirt, debris, oil, and grease that can affect adhesion of coating by power washing at maximum 2,000 psi (13,800 kPa).
    - a. Dispose of waste water in accordance with requirements of authorities having jurisdiction.
  - 4. Verify that existing substrate is dry before proceeding with application of coating. Spot check substrates with an electrical capacitance moisture-detection meter.
  - 5. Verify adhesion of new products.
- D. Existing Flashing and Detail Preparation: Repair flashings, gravel stops, copings, and other roof-related sheet metal and trim elements. Reseal joints, replace loose or missing fasteners, and replace components where required to leave in a watertight condition.
  - 1. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings specified in Division 07 Section "Sheet Metal Flashing and Trim."
  - 2. Roof Drains: Remove drain strainer and clamping ring. Grind metal surfaces down to clean, bare, metal.
- E. Surface Priming: Prime surfaces to receive fluid-applied coating using coating manufacturer's recommended product for surface material. Apply at application rate recommended by manufacturer.
  - 1. Ensure primer does not puddle and substrate has complete coverage.
  - 2. Allow to cure completely prior to application of coating.
- F. Membrane Seam Reinforcement: Reinforce membrane seams using seam sealer mastic and reinforcing fabric overlapping onto field of existing membrane not less than width required by roof coating manufacturer.

### 3.04 FLUID-APPLIED FLASHING APPLICATION

- A. Fluid-Applied Flashing and Detail Base Coat Application: Complete base coat and fabric reinforcement at parapets, curbs, penetrations, and drains prior to application of field of fluid-applied membrane. Apply base coat in accordance with manufacturer's written instructions.
  - 1. Apply base coat on prepared and primed surfaces and spread coating evenly. Extend coating minimum of 8 inches (200 mm) up vertical surfaces and 4 inches (100 mm) onto horizontal surfaces.
  - 2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  - 3. Reinforcing Fabric: Embed fabric reinforcement into wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
    - a. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
  - 4. Roof Drains: Install base coat onto surrounding membrane surface and metal drain bowl flange. Install target piece of fabric reinforcement immediately into wet base coat and roll to fully embed and saturate fabric. Reinstall clamping ring and strainer following application of top coat. Replace broken drain ring clamping bolts.

### 3.05 FLUID-APPLIED MEMBRANE APPLICATION

- A. Fluid-Applied Membrane Base Coat: Apply base coat to field of membrane in accordance with manufacturer's written instructions.
    - 1. Apply base coat on prepared and primed surfaces and spread coating evenly.
-



- 
2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  3. Fabric Reinforcement: Embed fabric reinforcement into wet base coat. Lap adjacent pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
    - a. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
  - B. Fluid-Applied Membrane Top Coat: Apply top coat to field of membrane and flashings uniformly in a complete, continuous installation.
    1. Allow base coat to cure prior to application of top coat.
    2. Following curing of base coat and prior to application of top coat, sand raised or exposed edges of fabric reinforcement.
    3. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.
    4. Apply top coat extending coating up vertical surfaces and out onto horizontal surfaces. Install top coat over field base coat and spread coating evenly.
    5. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
    6. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

### 3.06 WALKWAY INSTALLATION

- A. Install walkways following application of coating. Locate as indicated, or as directed by Owner.
- B. Slip-Resistant Walkway Topcoat: Apply walkway second topcoat following application and curing of top coat. Locate as indicated on Drawings.
  1. Mask walkway location with tape.
  2. Prime first top coat prior to application of walkway top coat if walkway top coat is not applied within 72 hours of the first top coat application, using manufacturer's recommended primer.
  3. Apply walkway topcoat and back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  4. Broadcast Slip-Resistant Top Coat Aggregate in wet top coat at rate indicated in Part 2 product listing or as otherwise recommended by coating manufacturer.
    - a. Back roll aggregate and top coat creating even dispersal of aggregate. Remove masking immediately.

### 3.07 FIELD QUALITY CONTROL

- A. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation, and submit report. Notify Architect 48 hours in advance of dates and times of inspections. Inspect work as follows:
  1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
  2. Following application of re-coating to flashings and application of base coat to field of roof.
  3. Upon completion of re-coating but prior to re-installation of other roofing components.
- B. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.
- C. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

### 3.08 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
-



- B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**END OF SECTION**



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**SECTION 07 4213  
INSULATED WINDOW PANELS**

**PART 1 - GENERAL**

**1.01 - SCOPE**

- A. The Panels required are as manufactured by Mapes Architectural Panels, LLC, Lincoln, NE. Panels consist of metal skins laminated to stabilizer substrates with an insulating core material. Panels are designed to be glazed into a window system.

**1.02 QUALITY ASSURANCE**

- A. Panel manufacturer shall have a minimum of 25 years experience.
- B. Field measurements shall be taken prior to completion of manufacturing and cutting.
- C. Maximum deviation from vertical and horizontal alignment of installed panels is 1/8" (3mm) in 20' (6m) non-commutative.

**1.03 REFERENCES**

- A. American Society of Testing Materials (ASTM)
  - 1. E330-84: Structural Performance of Exterior Windows, Curtain Walls and Doors under the influence of wind loads.
  - 2. D1781-76: Climbing Drum Peel Test for Adhesives.
  - 3. D3363-74: Method for Film Hardness by Pencil Test.
  - 4. D2794-90: Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
  - 5. D3359-90: Method for Measuring Adhesion by the tape test.

**1.04 SUBSTITUTIONS**

- A. The materials and products specified in this section establish a minimum standard of required function, design, appearance quality and warranty to be met by any proposed substitution.

**1.05 SUBMITTALS**

- A. Submittals shall be in conformance with Division 1.
- B. Samples:
  - 1. Panel makeup - 2 samples - 10"x10".
  - 2. Two samples of each color and finish texture - 3"x5".
- C. Submission Drawings: Indicate thickness, dimension and components of parts. Detail glazing methods, framing and tolerances to accommodate thermal movement.
- D. Affidavit certifying materials meet all requirements as specified.
- E. 2 copies of manufacturers standard literature for specified material.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Protect finish and edge in accordance with panel manufacturer's recommendations.
- B. Store materials in accordance with panel manufacturer's recommendations.

**PART 2 - PRODUCTS**

**2.01 PANELS - LAMINATED**

- A. Laminated metal faced Mapes-R panels as manufactured by Mapes Industries, Inc.
- B. Acceptable alternatives: Panels having similar composite construction and finish providing manufacturer has a minimum of 25 years panel laminating experience and comparable published warranties.

**2.02 FINISH**

- A. Finishes
    - 1. Exterior: Porcelain on Steel.
    - 2. Interior: Standard Kynar.
-



3. Color as selected by Architect.

## **2.03 PANEL FABRICATION**

- A. Exterior Substrate: Cement Board.
- B. Core: Isocyanurate.
- C. Interior Substrate: Cement Board.
- D. Tolerances - .8% of panels dimension length and width - (+/-) 1/16" thickness.
- E. Panel Thickness - 1".
- F. R-Value - 5.88 .
- G. U-Value - 0.17 .

## **2.04 ACCESSORIES**

- A. Recommended for use as an infill panel component in window systems. Related material to complete installation as recommended by the manufacturer.
- B. Seals against moisture intrusion as recommended by the manufacturer. Polyurethane and silicone based sealant with a 20 year life.

# **PART 3 - EXECUTION**

## **3.01 - INSTALLATION**

- A. Panel surfaces shall be free from defects prior to installation.

## **3.02 EXECUTION**

- A. Erect panels plumb, level and true.
- B. Glaze panels securely and in accordance with approved shop drawings and manufacturer's written instructions to allow for necessary thermal movement and structural support.
- C. Do not install panels that are observed to be defective including warped, bowed, dented, scratched and delaminating components.
- D. Weatherseal all joints as required using methods and materials as previously specified.
- E. Separate dissimilar metals using gasketed fasteners and blocking to eliminate the possibility of electrolytic reaction.

## **3.03 ADJUSTING AND CLEANING**

- A. Remove masking film as soon as possible after installation. Masking intentionally left in place after panel installation will be the responsibility of the contractor.
- B. Weep holes and drainage channels must be unobstructed and free from dirt and sealant.

**END OF SECTION**



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**SECTION 07 5600.13**  
**FLUID-APPLIED MEMBRANE ROOFING, INSULATED****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section includes fluid-applied roof membrane system on insulated metal deck, concrete deck, lightweight insulating concrete over metal deck, wood deck, cementitious wood fiber deck, and gypsum deck.
  - 1. Base sheet (lightweight insulating concrete deck, wood deck, cementitious wood fiber deck, gypsum deck)
  - 2. Roof insulation and cover board.
  - 3. Base-ply sheet.
  - 4. Application of fluid-applied, reinforced polyurethane roof membrane and membrane flashings.
- B. Related Information:
  - 1. Division 07 Section "Preparation for Re-Roofing" for existing roofing tearoff and substrate preparation for installation of new roofing membrane.
  - 2. Division 07 Section "Sheet Metal Flashing and Trim" for manufactured reglets, formed metal roof flashings, expansion joints, copings, and roof edge metal.

**1.02 ROOFING CONFERENCES**

- A. Roofing Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system.
  - 1. Meet with Owner; Architect; roofing materials manufacturer's representative; roofing Installer including project manager and foreman; and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
  - 2. Review methods and procedures related to preparation, including membrane roofing system manufacturer's written instructions.
  - 3. Review drawings and specifications.
  - 4. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.
  - 5. Review roof drainage during each stage of roofing and review roof drain plugging and plug removal procedures.
  - 6. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 7. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect re-coating.
  - 8. Review HVAC shutdown and sealing of air intakes.
  - 9. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
  - 10. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.
  - 11. Review governing regulations and requirements for insurance and certificates if applicable.
  - 12. Review existing conditions that may require notification of Owner before proceeding.

**1.03 DEFINITIONS**

- A. Roofing Terminology: Refer to ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product specified.
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- B. Sustainable Design Submittals:
    - 1. Product Test Reports for Solar Reflectance: For roof coating, indicating that coated roof will comply with solar reflectance index requirement.
  - C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened components.
    - 1. Base flashings and terminations.
      - a. Indicate details meet requirements of NRCA and FMG required by this Section.
    - 2. Tapered insulation, including slopes.
    - 3. Crickets, saddles, and tapered edge strips, including slopes.
    - 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
  - D. Samples for Verification: For the following products:
    - 1. 8-by-10-inch square of fluid-applied membrane, and sheet materials.
    - 2. 8-by-10-inch square of roof insulation and cover board.
    - 3. Walkway pads.
    - 4. Six insulation fasteners of each type, length, and finish.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
  - 1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.
  - 2. Certificate indicating Installer is qualified in Project jurisdiction to perform asbestos abatement.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- D. Warranties: Unexecuted sample copies of special warranties.
- E. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by re-coating operations. Submit before Work begins.
- F. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.
  - 1. Submit report within 48 hours after inspection.

#### **1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: To include in maintenance manuals.
- B. Warranties: Executed copies of approved warranty forms.

#### **1.07 QUALITY ASSURANCE**

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:
    - 1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
  - B. Manufacturer Qualifications: Approved manufacturer listed in this Section, with minimum five years' experience in manufacture of specified products in successful use in similar applications.
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1. Approval of Other Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
    - a. Product data, including certified independent test data indicating compliance with requirements.
    - b. Samples of each component.
    - c. Sample submittal from similar project.
    - d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
    - e. Sample warranty.
  - C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
    1. An authorized full-time technical employee of the manufacturer.
    2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Handle and store roofing materials, and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
- C. Protect materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting.

#### **1.09 PROJECT / FIELD CONDITIONS**

- A. Protect building, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from roofing operations.
  - B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
  - C. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.
    1. Store all materials prior to application at temperatures between 60 and 90 deg. F.
    2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer. Do not apply materials when air temperature is below 50 or above 110 deg. F.
    3. Do not apply roofing in snow, rain, fog, or mist.
  - D. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
  - E. Owner will occupy portions of building immediately below roofing area. Conduct roofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
-



**1.10 WARRANTY**

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
  - 1. Form of Warranty: Manufacturer's standard warranty form.
  - 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
  - 3. Warranty Period: 20 years from date of completion.
- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
  - 1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
  - 1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
  - 2. Scope of Warranty: Work of this Section.
  - 3. Warranty Period: 2 years from date of completion.

**PART 1 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, [www.tremcoroofing.com](http://www.tremcoroofing.com) that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.
  - 1. Manufacturers of comparable products: Approved by Architect prior to bid.

**2.02 PERFORMANCE REQUIREMENTS**

- A. General: Provide roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
    - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
    - 2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
  - B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
  - C. Roofing System Design: Provide roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures.
    - 1. All Zones (Corner, Perimeter, and Field-of-Roof) Uplift Pressures: As indicated on Drawings.
  - D. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1.
    - 1. Design Pressure: As indicated on Drawings.
  - E. Flashings: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Manufactured Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations of the following:
    - 1. FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings.
    - 2. FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.
-



3. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
  4. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
- F. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- G. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## 2.03 MATERIALS

- A. General: Roofing materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.
- B. Temporary Roofing Materials: Selection of materials and design of temporary roofing is responsibility of Contractor.
- C. General: Provide adhesive and sealant materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.
1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
  2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
    - a. Plastic Foam Adhesives: 50 g/L.
    - b. Gypsum Board and Panel Adhesives: 50 g/L.
    - c. Multipurpose Construction Adhesives: 70 g/L.
    - d. Other Adhesives: 250 g/L.
    - e. Sealant Primers for Porous Substrates: 775 g/L.

## 2.04 SHEET MATERIALS

- A. Vented Base Sheet: (Lightweight insulating concrete deck)
1. Venting base sheet, non-perforated, asphalt-impregnated and coated glass fiber reinforced sheet, ASTM D4601 Type I.
    - a. Basis of design product: Venting base sheet, non-perforated, ASTM D4601 Type I.
- B. Base Sheet: (Wood deck, cementitious wood fiber deck and gypsum deck)
1. Base Sheets: SBS-modified asphalt coated composite polyester / fiberglass/fiberglass mat reinforced high tensile strength base sheet, ASTM D4601 Type II.
    - a. Basis of design product: Tremco, BURmastic Composite Ply HT.
    - b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 165 lbf/in (725 N); Cross machine direction, 150 lbf/in (660 N).
    - c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 260 lbf (1150 N); Cross machine direction, 230 lbf ( 1120 N).
    - d. Thickness, minimum, ASTM D5147: 0.060 inch (1.5 mm).
- C. Base-Ply Sheet:
1. SBS-modified asphalt coated composite polyester / fiberglass/fiberglass mat reinforced high tensile strength base sheet, ASTM D4601 Type II.
    - a. Basis of design product: Tremco, BURmastic Composite Ply HT.
    - b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 165 lbf/in (725 N); Cross machine direction, 150 lbf/in (660 N).
    - c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 260 lbf (1150 N); Cross machine direction, 230 lbf ( 1120 N).
    - d. Thickness, minimum, ASTM D5147: 0.060 inch (1.5 mm).



D. Flashing Base-Ply Sheet: Same product as base-ply sheet.

## 2.05 FLUID-APPLIED ROOFING MEMBRANE

A. Polyurethane Elastomeric Fluid-Applied System: Two-coat reinforced fluid-applied roofing membrane formulated for application over prepared existing roofing substrate.

1. Base Coat:

a. Polyurethane Roof Coating System Base Coat: Bio-based, low-odor low-VOC two-part, for use with a compatible top coat.

- 1) Basis of design product: Tremco, AlphaGuard BIO Base Coat.
- 2) Combustion Characteristics, UL 790: Maintains combustion characteristics of existing roof system.
- 3) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 1 g/L.
- 4) Accelerated Weathering, 5000 hours, ASTM G154: Pass.
- 5) Hardness, Shore A, minimum, ASTM D2240: 80.
- 6) Solids, by volume, ASTM D2697: 100 percent.
- 7) Bio-Based Content, Minimum: 70 percent.
- 8) Minimum Thickness, Base Coat reinforced over Smooth BUR, MB, Concrete, Single-Ply: 48 mils (1.22 mm) wet.

2. Top Coat:

a. Polyurethane roof coating system top coat, bio-based low-odor low-VOC two-part, for application over compatible base coat.

- 1) Basis of design product: Tremco, AlphaGuard BIO Top Coat.
- 2) Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system.
- 3) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 6 g/L.
- 4) Solar Reflectance Index (SRI), ASTM E1980: For white, not less than 103.
- 5) Accelerated Weathering, 5000 hours, ASTM G 154: Pass.
- 6) Hardness, Shore A, minimum, ASTM D2240: 81.
- 7) Solids, by volume, ASTM D2697: 100 percent.
- 8) Bio-Based Content, Minimum: 60 percent.
- 9) Minimum Thickness, reinforced system: 32 mils (0.81 mm) wet.
- 10) Minimum Thickness, Slip-Resistant Coat: 24 mils (0.60 mm) wet.
- 11) Color: White.

3. Reinforcing Fabric:

a. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.

- 1) Basis of design product: Tremco, Permafab.
- 2) Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..
- 3) Elongation, Minimum, ASTM D1682: 60 percent.
- 4) Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
- 5) Weight: 3 oz./sq. yd (102 g/sq. m).

4. Primers:

a. Primer for Asphaltic and Single-Ply Membranes: Water-based, polymer-modified quick-dry low odor primer.

- 1) Basis of design product: Tremco, AlphaGuard WB Primer.
- 2) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 1 g/L.
- 3) Solids, by weight: 70 percent.

b. Primer for Masonry Surfaces: Two-part high-solids epoxy-penetrating low-odor primer for masonry and concrete surfaces.

- 1) Basis of design product: Tremco, AlphaGuard C-Prime.



- 2) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
- 3) Solids, by weight: 100 percent.
- c. Primer for Non-Porous Surfaces: Single-part, water based primer to promote adhesion of urethanes to metals, PVC and other non-porous surfaces.
  - 1) Basis of design product: Tremco, AlphaGuard M-Prime.
  - 2) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 22 g/L.
  - 3) Nonvolatile Content, minimum, ASTM D2369: 5 percent.
  - 4) Density at 77 deg F (25 deg C): 8.3 lb/gal (1kg/L).

## 2.06 ADHESIVE MATERIALS

- A. Base-Ply Sheet Adhesive:
  1. Cold-applied bio-based low odor urethane roofing adhesive, two-part, USDA BioPreferred, formulated for compatibility and use with specified roofing membranes and flashings.
    - a. Basis of design product: Tremco, POWERply Endure BIO Adhesive TF.
    - b. Volatile Organic Compounds (VOC), maximum, ASTM D3690: 0 g/L.
    - c. Low Temperature Flexibility, ASTM D2240: Pass at -30 deg F (-34 deg C).
    - d. Solids, by Volume, ASTM D2697: 100 percent.
    - e. Biobase Content, Minimum, ASTM D6866: 70 percent.
- B. Flashing Base-Ply Sheet Adhesive: Same product as base-ply sheet adhesive.

## 2.07 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system and fluid-applied roofing system.
- B. Joint Sealant: Elastomeric joint sealant compatible with applied coating, with movement capability appropriate for application.
  1. Joint Sealant, Polyurethane: ASTM C920, Type S, Grade NS, Class 50 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints; paintable.
    - a. Basis of design product: Tremco, TremSEAL Pro.
    - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 40 g/L.
    - c. Hardness, Shore A, ASTM C661: 40.
    - d. Adhesion to Concrete, ASTM C794: 35 pli.
    - e. Tensile Strength, ASTM D412: 350 psi (2410 kPa).
    - f. Color: Closest match to substrate.
- C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing manufacturer for application.
- D. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- E. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

## 2.08 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- B. Roof Insulation:
  1. Board Insulation, Polyisocyanurate: CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces, ASTM C1289 Type II Class 1.
    - a. Basis of design product: Tremco, Trisotech Insulation.
    - b. Compressive Strength, ASTM D1621: Grade 2: 20 psi (138 kPa).
    - c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.



- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated, not less than two times the roof slope.

## 2.09 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with built-up roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate and acceptable to roofing manufacturer.
- C. Roof Insulation Adhesive:
  - 1. Urethane adhesive, bead-applied, low-rise two-component solvent-free low odor, formulated to adhere roof insulation to substrate.
    - a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.
    - b. Flame Spread Index, ASTM E84: 10.
    - c. Smoke Developed Index, ASTM E84: 30.
    - d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
    - e. Tensile Strength, minimum, ASTM D412: 250 psi (1720 kPa).
    - f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.50 kN/m).
    - g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.
- D. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- E. Wood Cant Strips: Comply with requirements in Division 06 Section " Miscellaneous Rough Carpentry."
- F. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- G. Cover Board:
  - 1. Gypsum panel, glass-mat-faced, primed, ASTM C1177/C1177M.
    - a. Basis of design product: Tremco/GP Gypsum DensDeck Prime.
    - b. Thickness: 1/2 inch (12 mm).
- H. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass fiber.

## 2.10 WALKWAYS

- A. Walkway Materials:
  - 1. Polyurethane Top Coat, Slip-Resistant: Second top coat with broadcast slip-resistant aggregate.
    - a. Basis of design product: Tremco, AlphaGuard BIO Top Coat Slip-Resistant.
    - b. Minimum Thickness: 24 wet mils, (0.60 mm) wet; over cured top coat.
    - c. Silica sand aggregate: 20 to 30 lb/100 sq. ft..
    - d. Color: As selected from manufacturer's standard colors.

## PART 1 EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
  - 2. Verify that, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation. wood cants
  - 3. Metal Deck:



- a. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
4. Concrete Deck:
  - a. Verify that minimum concrete drying period recommended by roofing manufacturer has passed.
  - b. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- B. Proceed with installation once unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Remove existing roofing and protect existing building in accordance with requirements of Section 070150.19 "Preparation for Re-Roofing."
- B. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.
- C. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with re-coating work that could affect indoor air quality or activate smoke detectors in the ductwork.
  1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
  1. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

### **3.03 MEMBRANE ROOFING INSTALLATION, GENERAL**

- A. Install roofing membrane according to roofing manufacturer's written instructions.
  1. Commence installation of roofing in presence of manufacturer's technical personnel.
- B. Coordinate installation of roofing so insulation and other components of roofing not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
  1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement with joints and edges sealed.
  2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
  3. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Substrate-Joint Penetrations: Prevent fluid-applied materials and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.

### **3.04 BASE SHEET INSTALLATION**

- A. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:
  1. Mechanically fasten to substrate.

### **3.05 INSULATION INSTALLATION**

- A. Comply with roofing manufacturer's written instructions for installing roof insulation.
  - B. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
  - C. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated, not less than 1/8 inch per 12 inches (1:96).
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1. Where saddles or crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of two times the roof slope and not less than 1/4 inch in 12 inches (1:48).
  - D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
    1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
  - E. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
    1. Tapered Insulation System for Flat Roof Deck: Install insulation as follows:
      - a. Minimum total thickness of Continuous Insulation: 5.2 inches.
      - b. Minimum Continuous Insulation R-value: Not less than 30.
    2. Drain Sumps: At internal roof drains, slope insulation to create a square drain sump, having a maximum depth of 1 inch (25 mm).
  - F. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
  - G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
  - H. Adhered Insulation: (Concrete deck, lightweight insulating concrete deck, wood deck, cementitious wood fiber deck, and gypsum deck) Install each layer of insulation and adhere to substrate as follows:
    1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
  - I. Mechanically Fastened and Adhered Insulation: (Metal deck) Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
    1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
    2. Set each additional layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
  - J. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.
    1. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover in place.

### 3.06 BASE-PLY SHEET INSTALLATION

- A. Install base sheet starting at low point of roofing. Align base sheet without stretching. Shingle side laps of base a minimum of 4 inches. Shingle in direction to shed water. Extend base sheets over edges and terminate above cants.
    1. Embed base sheet in cold-applied membrane adhesive applied at rate required by roofing manufacturer.
  - B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing and 6 inches (150 mm) onto field of roofing.
  - C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
    1. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
  - D. Install stripping according to roofing manufacturer's written instructions where metal flanges and edgings are set on roofing.
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1. Flashing Sheet Stripping: Install flashing sheet stripping in specified cold adhesive and extend onto roofing membrane.
- E. Roof Drains: Install base sheet in cold adhesive around drain bowl. Base sheet must be installed so that it will be under compression from the clamping ring. Install base coat, fabric reinforcement, and top coat over base sheet. Install drain clamping ring and strainer.

### 3.07 FLUID-APPLIED FLASHING APPLICATION

- A. Fluid-Applied Flashing and Detail Base Coat Application: Complete base coat and fabric reinforcement at parapets, curbs, penetrations, and drains prior to application of field of fluid-applied membrane. Apply base coat in accordance with manufacturer's written instructions.
  1. Extend coating minimum of 8 inches up vertical surfaces and 4 inches onto horizontal surfaces.
  2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  3. Reinforcing Fabric: Embed fabric reinforcement into wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches along edges and 6 inches at end laps.
    - a. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
  4. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
  5. Roof Drains: Install base coat onto surrounding membrane surface and metal drain bowl flange. Install target piece of fabric reinforcement immediately into wet base coat and roll to fully embed and saturate fabric. Reinstall clamping ring and strainer following application of top coat. Replace broken drain ring clamping bolts.
  6. Allow base coat to cure prior to application of top coat.

### 3.08 FLUID-APPLIED MEMBRANE APPLICATION

- A. Base Coat: Apply base coat to field of membrane in accordance with manufacturer's written instructions.
  1. Apply base coat on prepared and primed surfaces and spread coating evenly.
  2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  3. Reinforcing Fabric: Embed fabric reinforcement into wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches along edges and 6 inches at end laps.
    - a. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
  4. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
  5. Allow base coat to cure prior to application of top coat.
- B. Top Coat: Apply top coat to field of membrane and flashings uniformly in a complete, continuous installation.
  1. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.
  2. Apply top coat extending coating up vertical surfaces and out onto horizontal surfaces. Install top coat over field base coat and spread coating evenly.
  3. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  4. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

### 3.09 WALKWAY INSTALLATION

- A. Walkways, General: Install walkways according to roofing manufacturer's written instructions.



1. Install walkways at following locations:
  - a. Where indicated on Drawings.
- B. Slip-Resistant Walkway Topcoat: Apply walkway second topcoat following application and curing of top coat. Locate as indicated on Drawings.
  1. Mask walkway location with tape.
  2. Prime first top coat prior to application of walkway top coat if walkway top coat is not applied within 72 hours of the first top coat application, using manufacturer's recommended primer.
  3. Apply walkway topcoat and back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
  4. Broadcast Slip-Resistant Top Coat Aggregate in wet top coat at rate indicated in Part 2 product listing or as otherwise recommended by coating manufacturer.
    - a. Back roll aggregate and top coat creating even dispersal of aggregate.
  5. Remove masking immediately.

### **3.10 FIELD QUALITY CONTROL**

- A. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation, and submit report to the Architect. Notify Architect 48 hours in advance of dates and times of inspections. Inspect work as follows:
  1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
  2. Following application of re-coating to flashings and application of base coat to field of roof.
  3. Upon completion of re-coating but prior to re-installation of other roofing components.
- B. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.
- C. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

### **3.11 PROTECTING AND CLEANING**

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**END OF SECTION**



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**SECTION 07 8413  
PENETRATION FIRESTOPPING**

**PART 1 GENERAL**

**1.01 SUMMARY**

**1.02 SECTION INCLUDES:**

- A. Penetrations in fire-resistance-rated walls.
- B. Penetrations in horizontal assemblies.

**1.03 RELATED SECTIONS:**

- A. Section 078446 "Fire-Resistive Joint Systems" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

**1.04 ACTION SUBMITTALS**

**1.05 PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.**

**1.06 PRODUCT SCHEDULE: FOR EACH PENETRATION FIRESTOPPING SYSTEM. INCLUDE LOCATION AND DESIGN DESIGNATION OF QUALIFIED TESTING AND INSPECTING AGENCY.**

- A. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

**1.07 INFORMATIONAL SUBMITTALS**

**1.08 QUALIFICATION DATA: FOR QUALIFIED INSTALLER.**

**1.09 INSTALLER CERTIFICATES: FROM INSTALLER INDICATING PENETRATION FIRESTOPPING HAS BEEN INSTALLED IN COMPLIANCE WITH REQUIREMENTS AND MANUFACTURER'S WRITTEN RECOMMENDATIONS.**

**1.10 PRODUCT TEST REPORTS: BASED ON EVALUATION OF COMPREHENSIVE TESTS PERFORMED BY A QUALIFIED TESTING AGENCY, FOR PENETRATION FIRESTOPPING.**

**1.11 QUALITY ASSURANCE**

**1.12 INSTALLER QUALIFICATIONS: A FIRM THAT HAS BEEN APPROVED BY FM GLOBAL ACCORDING TO FM GLOBAL 4991, "APPROVAL OF FIRESTOP CONTRACTORS," OR BEEN EVALUATED BY UL AND FOUND TO COMPLY WITH ITS "QUALIFIED FIRESTOP CONTRACTOR PROGRAM REQUIREMENTS."**

- A. Be a member in good standing of the Fire Stop Contractors International Association
- B. Licensed by a state or local authority , where applicable
- C. Approved by the Universities Fire Marshal for each specific Job
- D. Shown to have successfully completed not less than 5 comparable size projects.

**1.13 FIRE-TEST-RESPONSE CHARACTERISTICS: PENETRATION FIRESTOPPING SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:**

- A. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
- B. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
  - 1. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
  - 2. Classification markings on penetration firestopping correspond to designations listed by the following:



- a. UL in its "Fire Resistance Directory."

**1.14 PREINSTALLATION CONFERENCE: CONDUCT CONFERENCE AT PROJECT SITE.**

**1.15 PROJECT CONDITIONS**

**1.16 ENVIRONMENTAL LIMITATIONS: DO NOT INSTALL PENETRATION FIRESTOPPING WHEN AMBIENT OR SUBSTRATE TEMPERATURES ARE OUTSIDE LIMITS PERMITTED BY PENETRATION FIRESTOPPING MANUFACTURERS OR WHEN SUBSTRATES ARE WET BECAUSE OF RAIN, FROST, CONDENSATION, OR OTHER CAUSES.**

**1.17 INSTALL AND CURE PENETRATION FIRESTOPPING PER MANUFACTURER'S WRITTEN INSTRUCTIONS USING NATURAL MEANS OF VENTILATIONS OR, WHERE THIS IS INADEQUATE, FORCED-AIR CIRCULATION.**

**1.18 COORDINATION**

**1.19 COORDINATE CONSTRUCTION OF OPENINGS AND PENETRATING ITEMS TO ENSURE THAT PENETRATION FIRESTOPPING IS INSTALLED ACCORDING TO SPECIFIED REQUIREMENTS.**

**1.20 COORDINATE SIZING OF SLEEVES, OPENINGS, CORE-DRILLED HOLES, OR CUT OPENINGS TO ACCOMMODATE PENETRATION FIRESTOPPING.**

**1.21 NOTIFY OWNER'S TESTING AGENCY AT LEAST SEVEN DAYS IN ADVANCE OF PENETRATION FIRESTOPPING INSTALLATIONS; CONFIRM DATES AND TIMES ON DAY PRECEDING EACH SERIES OF INSTALLATIONS.**

**PART 1 PRODUCTS**

**2.01 MANUFACTURERS**

**2.02 BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE HILTI, INC.**

**2.03 PENETRATION FIRESTOPPING**

**2.04 PROVIDE PENETRATION FIRESTOPPING THAT IS PRODUCED AND INSTALLED TO RESIST SPREAD OF FIRE ACCORDING TO REQUIREMENTS INDICATED, RESIST PASSAGE OF SMOKE AND OTHER GASES, AND MAINTAIN ORIGINAL FIRE-RESISTANCE RATING OF CONSTRUCTION PENETRATED. PENETRATION FIRESTOPPING SYSTEMS SHALL BE COMPATIBLE WITH ONE ANOTHER, WITH THE SUBSTRATES FORMING OPENINGS, AND WITH PENETRATING ITEMS IF ANY.**

**2.05 PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: PROVIDE PENETRATION FIRESTOPPING WITH RATINGS DETERMINED PER ASTM E 814 OR UL 1479, BASED ON TESTING AT A POSITIVE PRESSURE DIFFERENTIAL OF 0.01-INCH WG.**

- A. Fire-resistance-rated walls include fire-barrier walls.
- B. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

**2.06 PENETRATIONS IN HORIZONTAL ASSEMBLIES: PROVIDE PENETRATION FIRESTOPPING WITH RATINGS DETERMINED PER ASTM E 814 OR UL 1479, BASED ON TESTING AT A POSITIVE PRESSURE DIFFERENTIAL OF 0.01-INCH WG.**

- A. Horizontal assemblies include floors.
- B. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
- C. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

**2.07 PENETRATIONS IN SMOKE BARRIERS: PROVIDE PENETRATION FIRESTOPPING WITH RATINGS DETERMINED PER UL 1479.**

- A. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.



- 2.08 W-RATING: PROVIDE PENETRATION FIRESTOPPING SHOWING NO EVIDENCE OF WATER LEAKAGE WHEN TESTED ACCORDING TO UL 1479.**
- 2.09 EXPOSED PENETRATION FIRESTOPPING: PROVIDE PRODUCTS WITH FLAME-SPREAD AND SMOKE-DEVELOPED INDEXES OF LESS THAN 25 AND 450, RESPECTIVELY, AS DETERMINED PER ASTM E 84.**
- 2.10 VOC CONTENT: PENETRATION FIRESTOPPING SEALANTS AND SEALANT PRIMERS SHALL COMPLY WITH THE FOLLOWING LIMITS FOR VOC CONTENT WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24):**
- A. Sealants: 250 g/L.
  - B. Sealant Primers for Nonporous Substrates: 250 g/L.
  - C. Sealant Primers for Porous Substrates: 775 g/L.
- 2.11 LOW-EMITTING MATERIALS: PENETRATION FIRESTOPPING SEALANTS AND SEALANT PRIMERS SHALL COMPLY WITH THE TESTING AND PRODUCT REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES' "STANDARD PRACTICE FOR THE TESTING OF VOLATILE ORGANIC EMISSIONS FROM VARIOUS SOURCES USING SMALL-SCALE ENVIRONMENTAL CHAMBERS."**
- 2.12 ACCESSORIES: PROVIDE COMPONENTS FOR EACH PENETRATION FIRESTOPPING SYSTEM THAT ARE NEEDED TO INSTALL FILL MATERIALS AND TO MAINTAIN RATINGS REQUIRED. USE ONLY THOSE COMPONENTS SPECIFIED BY PENETRATION FIRESTOPPING MANUFACTURER AND APPROVED BY QUALIFIED TESTING AND INSPECTING AGENCY FOR FIRESTOPPING INDICATED.**
- A. Permanent forming/damming/backing materials, including the following:
    - 1. Slag-wool-fiber or rock-wool-fiber insulation.
    - 2. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - 3. Fire-rated form board.
    - 4. Fillers for sealants.
  - B. Temporary forming materials.
  - C. Substrate primers.
  - D. Collars.
  - E. Steel sleeves.



**2.13 FILL MATERIALS**

- 2.14 CAST-IN-PLACE FIRESTOP DEVICES: FACTORY-ASSEMBLED DEVICES FOR USE IN CAST-IN-PLACE CONCRETE FLOORS AND CONSISTING OF AN OUTER METALLIC SLEEVE LINED WITH AN INTUMESCENT STRIP, A RADIAL EXTENDED FLANGE ATTACHED TO ONE END OF THE SLEEVE FOR FASTENING TO CONCRETE FORMWORK, AND A NEOPRENE GASKET.**
- 2.15 LATEX SEALANTS: SINGLE-COMPONENT LATEX FORMULATIONS THAT DO NOT RE-EMULSIFY AFTER CURE DURING EXPOSURE TO MOISTURE.**
- 2.16 FIRESTOP DEVICES: FACTORY-ASSEMBLED COLLARS FORMED FROM GALVANIZED STEEL AND LINED WITH INTUMESCENT MATERIAL SIZED TO FIT SPECIFIC DIAMETER OF PENETRANT.**
- 2.17 INTUMESCENT COMPOSITE SHEETS: RIGID PANELS CONSISTING OF ALUMINUM-FOIL-FACED ELASTOMERIC SHEET BONDED TO GALVANIZED-STEEL SHEET.**
- 2.18 INTUMESCENT PUTTIES: NONHARDENING DIELECTRIC, WATER-RESISTANT PUTTIES CONTAINING NO SOLVENTS, INORGANIC FIBERS, OR SILICONE COMPOUNDS.**
- 2.19 INTUMESCENT WRAP STRIPS: SINGLE-COMPONENT INTUMESCENT ELASTOMERIC SHEETS WITH ALUMINUM FOIL ON ONE SIDE.**
- 2.20 MORTARS: PREPACKAGED DRY MIXES CONSISTING OF A BLEND OF INORGANIC BINDERS, HYDRAULIC CEMENT, FILLERS, AND LIGHTWEIGHT AGGREGATE FORMULATED FOR MIXING WITH WATER AT PROJECT SITE TO FORM A NONSHRINKING, HOMOGENEOUS MORTAR.**
- 2.21 SILICONE FOAMS: MULTICOMPONENT, SILICONE-BASED LIQUID ELASTOMERS THAT, WHEN MIXED, EXPAND AND CURE IN PLACE TO PRODUCE A FLEXIBLE, NONSHRINKING FOAM.**
- 2.22 SILICONE SEALANTS: SINGLE-COMPONENT, SILICONE-BASED, NEUTRAL-CURING ELASTOMERIC SEALANTS OF GRADE INDICATED BELOW:**
- A. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.



**2.23 MIXING**

**2.24 FOR THOSE PRODUCTS REQUIRING MIXING BEFORE APPLICATION, COMPLY WITH PENETRATION FIRESTOPPING MANUFACTURER'S WRITTEN INSTRUCTIONS FOR ACCURATE PROPORTIONING OF MATERIALS, WATER (IF REQUIRED), TYPE OF MIXING EQUIPMENT, SELECTION OF MIXER SPEEDS, MIXING CONTAINERS, MIXING TIME, AND OTHER ITEMS OR PROCEDURES NEEDED TO PRODUCE PRODUCTS OF UNIFORM QUALITY WITH OPTIMUM PERFORMANCE CHARACTERISTICS FOR APPLICATION INDICATED.**

**PART 1 EXECUTION**

**3.01 EXAMINATION**

**3.02 EXAMINE SUBSTRATES AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR OPENING CONFIGURATIONS, PENETRATING ITEMS, SUBSTRATES, AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK.**

**3.03 PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.**

**3.04 PREPARATION**

**3.05 SURFACE CLEANING: CLEAN OUT OPENINGS IMMEDIATELY BEFORE INSTALLING PENETRATION FIRESTOPPING TO COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND WITH THE FOLLOWING REQUIREMENTS:**

- A. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
- B. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
- C. Remove laitance and form-release agents from concrete.

**3.06 PRIMING: PRIME SUBSTRATES WHERE RECOMMENDED IN WRITING BY MANUFACTURER USING THAT MANUFACTURER'S RECOMMENDED PRODUCTS AND METHODS. CONFINE PRIMERS TO AREAS OF BOND; DO NOT ALLOW SPILLAGE AND MIGRATION ONTO EXPOSED SURFACES.**

**3.07 MASKING TAPE: USE MASKING TAPE TO PREVENT PENETRATION FIRESTOPPING FROM CONTACTING ADJOINING SURFACES THAT WILL REMAIN EXPOSED ON COMPLETION OF THE WORK AND THAT WOULD OTHERWISE BE PERMANENTLY STAINED OR DAMAGED BY SUCH CONTACT OR BY CLEANING METHODS USED TO REMOVE STAINS. REMOVE TAPE AS SOON AS POSSIBLE WITHOUT DISTURBING FIRESTOPPING'S SEAL WITH SUBSTRATES.**

**3.08 INSTALLATION**

**3.09 GENERAL: INSTALL PENETRATION FIRESTOPPING TO COMPLY WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND PUBLISHED DRAWINGS FOR PRODUCTS AND APPLICATIONS INDICATED.**

**3.10 INSTALL FORMING MATERIALS AND OTHER ACCESSORIES OF TYPES REQUIRED TO SUPPORT FILL MATERIALS DURING THEIR APPLICATION AND IN THE POSITION NEEDED TO PRODUCE CROSS-SECTIONAL SHAPES AND DEPTHS REQUIRED TO ACHIEVE FIRE RATINGS INDICATED.**

- A. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.



**3.11 INSTALL FILL MATERIALS FOR FIRESTOPPING BY PROVEN TECHNIQUES TO PRODUCE THE FOLLOWING RESULTS:**

- A. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
- B. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
- C. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

**3.12 IDENTIFICATION**

**3.13 IDENTIFY PENETRATION FIRESTOPPING WITH PREPRINTED METAL OR PLASTIC LABELS. ATTACH LABELS PERMANENTLY TO SURFACES ADJACENT TO AND WITHIN 6 INCHES OF FIRESTOPPING EDGE SO LABELS WILL BE VISIBLE TO ANYONE SEEKING TO REMOVE PENETRATING ITEMS OR FIRESTOPPING. USE MECHANICAL FASTENERS OR SELF-ADHERING-TYPE LABELS WITH ADHESIVES CAPABLE OF PERMANENTLY BONDING LABELS TO SURFACES ON WHICH LABELS ARE PLACED. INCLUDE THE FOLLOWING INFORMATION ON LABELS:**

- A. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
- B. Contractor's name, address, and phone number.
- C. Designation of applicable testing and inspecting agency.
- D. Date of installation.
- E. Manufacturer's name.
- F. Installer's name.

**3.14 FIELD QUALITY CONTROL**

**3.15 OWNER WILL ENGAGE A QUALIFIED TESTING AGENCY TO PERFORM TESTS AND INSPECTIONS.**

**3.16 WHERE DEFICIENCIES ARE FOUND OR PENETRATION FIRESTOPPING IS DAMAGED OR REMOVED BECAUSE OF TESTING, REPAIR OR REPLACE PENETRATION FIRESTOPPING TO COMPLY WITH REQUIREMENTS.**

**3.17 PROCEED WITH ENCLOSING PENETRATION FIRESTOPPING WITH OTHER CONSTRUCTION ONLY AFTER INSPECTION REPORTS ARE ISSUED AND INSTALLATIONS COMPLY WITH REQUIREMENTS.**

**3.18 CLEANING AND PROTECTION**

**3.19 CLEAN OFF EXCESS FILL MATERIALS ADJACENT TO OPENINGS AS THE WORK PROGRESSES BY METHODS AND WITH CLEANING MATERIALS THAT ARE APPROVED IN WRITING BY PENETRATION FIRESTOPPING MANUFACTURERS AND THAT DO NOT DAMAGE MATERIALS IN WHICH OPENINGS OCCUR.**

**3.20 PROVIDE FINAL PROTECTION AND MAINTAIN CONDITIONS DURING AND AFTER INSTALLATION THAT ENSURE THAT PENETRATION FIRESTOPPING IS WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION. IF, DESPITE SUCH PROTECTION, DAMAGE OR DETERIORATION OCCURS, IMMEDIATELY CUT OUT AND REMOVE DAMAGED OR DETERIORATED PENETRATION FIRESTOPPING AND INSTALL NEW MATERIALS TO PRODUCE SYSTEMS COMPLYING WITH SPECIFIED REQUIREMENTS.**

**3.21 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE**

**3.22 FIRESTOP SYSTEMS WITH NO PENETRATING ITEMS: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-0001-0999.



- 2. W-L-0001-0999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Silicone sealant.
  - 3. Intumescent putty.
  - 4. Mortar.

**3.23 FIRESTOP SYSTEMS FOR METALLIC PIPES, CONDUIT, OR TUBING: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-1001-1999.
  - 2. W-L-1001-1999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Silicone sealant.
  - 3. Intumescent putty.
  - 4. Mortar.

**3.24 FIRESTOP SYSTEMS FOR NONMETALLIC PIPE, CONDUIT, OR TUBING: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-2001-2999.
  - 2. W-L-2001-2999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Silicone sealant.
  - 3. Intumescent putty.
  - 4. Intumescent wrap strips.
  - 5. Firestop device.

**3.25 FIRESTOP SYSTEMS FOR ELECTRICAL CABLES: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-3001-3999.
  - 2. W-L-3001-3999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Silicone sealant.
  - 3. Intumescent putty.
  - 4. Silicone foam.

**3.26 FIRESTOP SYSTEMS FOR CABLE TRAYS: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-4001-4999.
  - 2. W-L-4001-4999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Intumescent putty.
  - 3. Silicone foam.

**3.27 FIRESTOP SYSTEMS FOR INSULATED PIPES: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-5001-5999.
  - 2. W-L-5001-5999.



- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Intumescent putty.
  - 3. Silicone foam.
  - 4. Intumescent wrap strips.

**3.28 FIRESTOP SYSTEMS FOR MISCELLANEOUS ELECTRICAL PENETRANTS: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-6001-6999.
  - 2. W-L-6001-6999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Intumescent putty.
  - 3. Mortar.

**3.29 FIRESTOP SYSTEMS FOR MISCELLANEOUS MECHANICAL PENETRATIONS: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-7001-7999.
  - 2. W-L-7001-7999.
- B. Type of Fill Materials: One or both of the following:
  - 1. Latex sealant.
  - 2. Mortar.

**3.30 FIRESTOP SYSTEMS FOR GROUPINGS OF PENETRATIONS: COMPLY WITH THE FOLLOWING:**

- A. Available UL-Classified Systems:
  - 1. C-AJ-8001-8999.
  - 2. W-L-8001-8999.
- B. Type of Fill Materials: One or more of the following:
  - 1. Latex sealant.
  - 2. Mortar.
  - 3. Intumescent wrap strips.
  - 4. Firestop device.
  - 5. Intumescent composite sheet.

**3.31 SMOKE-STOP SYSTEMS**

- A. For all non-rated partitions required to control smoke only provide the following:
  - 1. Mineral wool
  - 2. Fire and smoke stopping sealant

**END OF SECTION**



**SECTION 07 8446  
FIRE-RESISTIVE JOINT SYSTEMS****PART 1 GENERAL****1.01 SUMMARY**

- A. Section Includes:
  - 1. Joints at exterior curtain-wall/floor intersections.

**1.02 RELATED SECTIONS:**

- A. Section 07 8413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.
  - 1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified Installer.
- B. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."
  - B. Installer Qualifications: A firm experienced in installing fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its fire-resistive joint system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
  - C. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:
    - 1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
    - 2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
      - a. Fire-resistive joint system products bear classification marking of qualified testing agency.
      - b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
        - 1) UL in its "Fire Resistance Directory."
  - D. Preinstallation Conference: Conduct conference at Project site.
-



**1.06 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

**1.07 COORDINATION**

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

**PART 2 PRODUCTS****2.01 FIRE-RESISTIVE JOINT SYSTEMS**

- A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints at Exterior Curtain-Wall/Floor Intersections: Provide fire-resistive joint systems with rating determined by ASTM E 119 based on testing at a positive pressure differential of 0.01-inch wg or ASTM E 2307.
  - 1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
  - 2. Basis of Design Manufacturer: Hilti
    - a. Product:
- C. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- D. VOC Content: Fire-resistive joint system sealants shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Architectural Sealants: 250 g/L.
  - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 3. Sealant Primers for Porous Substrates: 775 g/L.
- E. Low-Emitting Materials: Fire-resistive joint system sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- F. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
  - B. Proceed with installation only after unsatisfactory conditions have been corrected.
-



**3.02 PREPARATION**

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
  - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
  - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

**3.03 INSTALLATION**

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
  - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
  - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

**3.04 IDENTIFICATION**

- A. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  - 1. The words "Warning - Fire-Resistive Joint System - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Designation of applicable testing agency.
  - 4. Date of installation.
  - 5. Manufacturer's name.
  - 6. Installer's name.

**3.05 FIELD QUALITY CONTROL**

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections.
-



- B. Where deficiencies are found or fire-resistive joint systems are damaged or removed due to testing, repair or replace fire-resistive joint systems so they comply with requirements.
- C. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and installations comply with requirements.

### **3.06 CLEANING AND PROTECTING**

- A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

### **3.07 FIRE-RESISTIVE JOINT SYSTEM SCHEDULE**

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN:
  - 1. Floor-to-Floor (Concrete to Concrete Floor), Fire-Resistive Joint System:
    - a. FF-D -0005.
      - 1) Assembly Rating: 2 hours.
      - 2) Nominal Joint Width: 1-inch
      - 3) Movement Capabilities: Class II - 12.5 percent compression or extension.
  - 2. Head-of-Wall (Steel Stud/Gypsum Board Wall to Concrete Floor Slab with or without Metal Deck), Fire-Resistive Joint System:
    - a. HW-D -0043.
      - 1) Assembly Rating: 2 hours.
      - 2) Nominal Joint Width: 1-inch
      - 3) Movement Capabilities: Class II - 18.75 percent compression and extension.

### **3.08 PERIMETER FIRE-RESISTIVE JOINT SYSTEMS**

- A. Where UL-classified perimeter fire-containment systems are indicated, they refer to alphanumeric designations listed in UL's "Fire Resistance Directory" under product Category XHDG.
  - 1. Perimeter Fire-Containment System (Steel Stud/Gypsum Board Wall to Concrete Floor Slab with or without Metal Deck), Fire-Resistive Joint System:
    - a. Basis-of-Design UL-Classified Product: CW-S-1002.
    - b. Integrity Rating: 2 hours.
    - c. Insulation Rating: ¼-hour.
    - d. Linear Opening Width: 2-1/2 inches, maximum.

**END OF SECTION**



**SECTION 07 9200  
JOINT SEALANTS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Silicone joint sealants.
  - 2. Non-staining silicone joint sealants.
  - 3. Mildew-resistant joint sealants.
  - 4. Latex joint sealants.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.
- C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- D. Sample Warranties: For special warranties.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
  - 1. Sealant and Waterproofing Specialist: Engage an experienced sealant and waterproofing firm to perform work of this Section. Firm shall have completed work similar to extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing sealants is insufficient experience for this work.
    - a. Field Supervision: Sealant and waterproofing specialist firms shall maintain experienced full-time supervisors on Project site during times that sealant and waterproofing work is in progress.
  - 2. Provide a list of a minimum of 5 projects where sealant and waterproofing work was successfully installed
- B. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
  - 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.



- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

#### **1.05 FIELD CONDITIONS**

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

#### **1.06 WARRANTY**

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 JOINT SEALANTS, GENERAL**

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content: Sealants and sealant primers shall comply with the following:
  - 1. Architectural sealants shall have a VOC content of 250 g/L or less.
  - 2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
  - 3. Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

#### **2.02 SILICONE JOINT SEALANTS**

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dow Corning Corporation.
      - 1) Product :791
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
      - 1) Product: SCS2000 SillPruf
    - c. Sika Corporation; Joint Sealants.
      - 1) Product: Sikasill WS-295

#### **2.03 NONSTAINING SILICONE JOINT SEALANTS**

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.



- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dow Corning Corporation.
      - 1) Product :795
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
      - 1) Product : Sillpruf NB
    - c. Tremco Incorporated.
    - d. Product : Spectrem 3
- C. Silicone, Nonstaining, M, NS, 50, T, NT: Nonstaining, multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type M, Grade NS, Class 50, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Tremco Incorporated.
      - 1) Product : Tremco Spectrum 4-TS

#### **2.04 MILDEW-RESISTANT JOINT SEALANTS**

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dow Corning Corporation.
      - 1) Product :786-M
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
      - 1) Product :Sanitary SCS1700
    - c. Tremco Incorporated.
      - 1) Product :Tremsil 200

#### **2.05 LATEX JOINT SEALANTS**

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Pecora Corporation.
      - 1) Product: AC-20s
    - b. Sherwin-Williams Company (The).
      - 1) Product: Bolt Quick Dry.
    - c. Tremco Incorporated.
      - 1) Product: Tremflex 834

#### **2.06 JOINT-SEALANT BACKING**

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
  - B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - 1. BASF Corporation; Construction Systems.
    - 2. Construction Foam Products; a division of Nomaco, Inc.
-



- C. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## **2.07 MISCELLANEOUS MATERIALS**

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
    - a. Concrete.
    - b. Masonry.
    - c. Unglazed surfaces of ceramic tile.
    - d. Exterior insulation and finish systems.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.



- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### **3.03 INSTALLATION OF JOINT SEALANTS**

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

### **3.04 CLEANING**

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### **3.05 PROTECTION**

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### **3.06 JOINT-SEALANT SCHEDULE**

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
-



1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Joints between plant-precast architectural concrete units.
    - c. Control and expansion joints in unit masonry.
    - d. Joints in dimension stone cladding.
    - e. Joints in glass unit masonry assemblies.
    - f. Joints in exterior insulation and finish systems.
    - g. Joints between metal panels.
    - h. Joints between different materials listed above.
    - i. Perimeter joints between materials listed above and frames of doors, windows and louvers.
    - j. Control and expansion joints in ceilings, and other overhead surfaces.
    - k. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, S, NS, 50, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Joints between plant-precast architectural concrete units.
    - c. Control and expansion joints in unit masonry.
    - d. Joints in dimension stone cladding.
    - e. Joints in glass unit masonry assemblies.
    - f. Joints in exterior insulation and finish systems.
    - g. Joints between metal panels.
    - h. Joints between different materials listed above.
    - i. Perimeter joints between materials listed above and frames of doors, windows and louvers.
    - j. Control and expansion joints in ceilings and other overhead surfaces.
    - k. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, Non-staining, S, NS, 50, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal traffic and nontraffic surfaces.
1. Joint Locations:
    - a. Exterior and interior joints in Concrete Slabs and Sidewalk
    - b. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, non-staining, S, NS, 50, T, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
    - a. Control joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Acrylic latex.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
    - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - b. Tile control and expansion joints where indicated.
-



- c. Other joints as indicated on Drawings.
- 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
- 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

**END OF SECTION**



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**SECTION 08 1113**  
**HOLLOW METAL DOORS AND FRAMES****PART 1 GENERAL****1.01 SUMMARY**

- A. Section includes hollow-metal work.

**1.02 DEFINITIONS**

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

**1.03 COORDINATION**

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each door type.
  - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
  - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 4. Locations of reinforcement and preparations for hardware.
  - 5. Details of each different wall opening condition.
  - 6. Details of anchorages, joints, field splices, and connections.
  - 7. Details of accessories.
  - 8. Details of moldings, removable stops, and glazing.
  - 9. Details of conduit and preparations for power, signal, and control systems.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
- B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
    - 1. Provide additional protection to prevent damage to factory-finished units.
  - B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
  - C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.
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**PART 1 PRODUCTS****2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ceco Door; ASSA ABLOY.
  - 2. Curries Company; ASSA ABLOY.
  - 3. Steelcraft; an Allegion brand.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

**2.02 REGULATORY REQUIREMENTS**

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
- B. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

**2.03 INTERIOR DOORS AND FRAMES**

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.
  - 1. Physical Performance: Level B according to SDI A250.4.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches (44.5 mm).
    - c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
    - d. Edge Construction: Model 1, Full Flush.
    - e. Core: Vertical steel stiffener with fiberglass between stiffeners
  - 3. Frames:
    - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
    - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
    - c. Construction: Full profile welded.
  - 4. Exposed Finish: Prime painted.
- C. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. At locations indicated in the Door and Frame Schedule and at cross-corridor doors.
  - 1. Physical Performance: Level A according to SDI A250.4.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches (44.5 mm).
    - c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.053 inch (1.3 mm). Face sheets to have a stainable wood-grain textured finish
    - d. Edge Construction: Model 1, Full Flush.



- e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
- f. Core: Polystyrene or Mineral board.
- 3. Frames:
  - a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
  - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
  - c. Construction: Full profile welded.
- 4. Exposed Finish: Prime painted.

#### **2.04 EXTERIOR HOLLOW-METAL DOORS AND FRAMES**

- A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
  - 1. Physical Performance: Level A according to SDI A250.4.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches (44.5 mm.)
    - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A60 (ZF180) coating.
    - d. Edge Construction: Model 1, Full Flush.
    - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
    - f. Core: Vertical steel stiffeners with foamed in place polyurethane.
      - 1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.
  - 3. Frames:
    - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A60 (ZF180) coating.
    - b. Construction: Full profile welded.
  - 4. Exposed Finish: Prime painted.

#### **2.05 BORROWED LITES**

- A. Hollow-metal frames of metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm).
- B. Construction: Full profile welded.

#### **2.06 HOLLOW-METAL PANELS**

- A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

#### **2.07 FRAME ANCHORS**

- A. Jamb Anchors:
  - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
  - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
  - 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.



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4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
  - B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
    1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
    2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

## 2.08 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
  1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Section 088000 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.09 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
  - B. Hollow-Metal Doors:
    1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
    2. Fire Door Cores: As required to provide fire-protection and temperature-rise ratings indicated.
    3. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
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4. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
  5. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
  6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
  7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
  2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
  5. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:
      - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
      - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
      - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
      - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
    - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
      - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
      - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
      - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
    - c. Compression Type: Not less than two anchors in each frame.
    - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
  6. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
  7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
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- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
    - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
    - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
  - F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
    - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
    - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
    - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
    - 4. Provide loose stops and moldings on inside of hollow-metal work.
    - 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
    - 6. Provide grained steel glazing trim where required to match texture of door face sheet.

## **2.10 STEEL FINISHES**

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
  - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
- B. Factory Finish: Provide stain and clear top-coat finish at wood-grained steel doors

## **2.11 ACCESSORIES**

- A. Louvers: Provide louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.
  - 1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
  - 2. Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other.
  - 3. Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same qualified testing and inspecting agency that established fire-resistance rating of door assembly.
- B. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- C. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
  - C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  - D. Proceed with installation only after unsatisfactory conditions have been corrected.
-



**3.02 PREPARATION**

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

**3.03 INSTALLATION**

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
  - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-rated openings, install frames according to NFPA 80.
    - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - c. Install frames with removable stops located on secure side of opening.
    - d. Install door silencers in frames before grouting.
    - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
  - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
  - 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
  - 5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
  - 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  - 7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
  - 8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.



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- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
    - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
    - c. At Bottom of Door: 3/4 inch (19.1 mm) plus or minus 1/32 inch (0.8 mm).
    - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
  2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
  3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- D. Glazing: Comply with installation requirements in Section 08 8000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

### **3.04 ADJUSTING AND CLEANING**

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
- F. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

**END OF SECTION**



**SECTION 08 1416  
FLUSH WOOD DOORS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Solid-core doors with wood-veneer faces.
  - 2. Factory finishing flush wood doors.
  - 3. Factory fitting flush wood doors to frames and factory machining for hardware.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
  - 1. Dimensions and locations of blocking.
  - 2. Dimensions and locations of mortises and holes for hardware.
  - 3. Dimensions and locations of cutouts.
  - 4. Undercuts.
  - 5. Requirements for veneer matching.
  - 6. Doors to be factory finished and finish requirements.
  - 7. Fire-protection ratings for fire-rated doors.
- C. Samples for Initial Selection: For factory-finished doors.
- D. Samples for Verification:
  - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Sample Warranty: For special warranty.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

**1.06 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during remainder of construction period.

**1.07 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.



- b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Algoma Hardwoods, Inc.
  2. Eggers Industries.
  3. Marshfield Door Systems, Inc. Signature Series – Basis of Design

### **2.02 FLUSH WOOD DOORS, GENERAL**

- A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
- B. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.
- C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
  2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
- D. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- E. Particleboard-Core Doors:
  1. Particleboard: ANSI A208.1, Grade LD-2.
- F. Mineral-Core Doors:
  1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
  2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
  3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
    - a. Screw-Holding Capability: 475 lbf (2110 N) per WDMA T.M.-10.

### **2.03 VENEER-FACED DOORS FOR TRANSPARENT FINISH**

- A. Interior Solid-Core Doors:
  1. Grade: Premium, with Grade A faces.
  2. Species: Select white maple.
  3. Cut: Plain sliced (flat sliced).
  4. Match between Veneer Leaves: Book match.
  5. Assembly of Veneer Leaves on Door Faces: Center-balance match.
  6. Exposed Vertical Edges: Same species as faces - edge Type A.
  7. Core: Particleboard or mineral core as needed to provide fire-protection rating indicated.
  8. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.



## **2.04 FABRICATION**

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
  - 1. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
  - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

## **2.05 FACTORY FINISHING**

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
  - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Transparent Finish:
  - 1. Grade: Premium.
  - 2. Finish: WDMA TR-6 catalyzed polyurethane.
  - 3. Staining: Match existing doors.
  - 4. Sheen: Match existing doors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
  - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Hardware: For installation, see Section 087100 "Door Hardware."
  - B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
    - 1. Install fire-rated doors according to NFPA 80.
    - 2. Install smoke- and draft-control doors according to NFPA 105.
  - C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
    - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
      - a. Comply with NFPA 80 for fire-rated doors.
      - b. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
    - 2. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.
  - D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
-



- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

### **3.03 ADJUSTING**

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

**END OF SECTION**



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**SECTION 08 1433  
STILE AND RAIL WOOD DOORS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Interior stile and rail wood doors.
  - 2. Interior fire-rated, stile and rail wood doors.
  - 3. Interior fire-rated, wood door and sidelite frames.
  - 4. Finishing stile and rail wood doors.
  - 5. Fitting stile and rail wood doors to frames and machining for hardware.
  - 6. Prehanging doors in frames.

**1.03 SUBMITTALS**

- A. Product Data: For each type of product indicated.
  - 1. Include details of construction and glazing.
  - 2. Include factory finishing specifications.
- B. Shop Drawings: For stile and rail wood doors. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:
  - 1. Dimensions of doors for factory fitting.
  - 2. Locations and dimensions of mortises and holes for hardware.
  - 3. Requirements for veneer matching.
  - 4. Doors to be factory finished, and finish requirements.
  - 5. Fire ratings for fire-rated doors.
- C. Samples for Initial Selection: For factory-finished doors.
- D. Warranty: Sample of special warranty.

**1.04 QUALITY ASSURANCE**

- A. Source Limitations: Obtain stile and rail wood doors from single manufacturer.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10C.
- C. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201, for Category II materials, unless those of Category I are expressly indicated and permitted.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with manufacturer's written instructions and requirements of quality standard referenced in Part 2.
- B. Package doors individually in opaque plastic bags or cardboard cartons.
- C. Mark each door on underside of bottom edge with opening number used on Shop Drawings.

**1.06 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.



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## 1.07 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship, or have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
  - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
    - a. Interior Doors: Life of installation.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. General: Use only materials that comply with referenced standards and other requirements specified.
  - 1. Assemble interior doors, frames, and sidelites, including components, with either dry-use or wet-use adhesives complying with ASTM D 5572 for finger joints and with ASTM D 5751 for joints other than finger joints.
- B. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea-formaldehyde resins.
- C. Panel Products: Any of the following:
  - 1. Particleboard made from wood particles, complying with ANSI A208.1, Grade M-2.
  - 2. Medium-density fiberboard made from wood fiber, complying with ANSI A208.2, Grade 130.
  - 3. Hardboard, complying with AHA A135.4.
  - 4. Veneer core plywood.

### 2.02 INTERIOR STILE AND RAIL WOOD DOORS

- A. Interior Stile and Rail Wood Doors: Stock interior doors complying with AWI's "Architectural Woodwork Quality Standards," and with other requirements specified.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Algoma Hardwoods, Inc.
    - b. Eggers Industries.
    - c. Maiman Company (The).
  - 2. Panel Designs: Indicated by Drawings. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
  - 3. Grade: Premium.
  - 4. Finish: Transparent.
  - 5. Wood Species and Cut for Transparent Finish: Match existing.
  - 6. Door Construction for Transparent Finish:
    - a. Non-Fire-Rated Doors: 1-3/4-inch-thick stiles and rails and veneered raised panels not less than 1-1/8 inches thick.
      - 1) Stile and Rail Construction: Clear lumber; may be edge glued for width. Select lumber for similarity of grain and color, and arrange for optimum match between adjacent pieces.
      - 2) Raised-Panel Construction: Veneered, shaped, wood-based panel product with veneer conforming to raised-panel shape.
    - b. 20-minute Fire-Rated Doors: 1-3/4-inch-thick stiles and rails and veneered raised panels not less than 1-1/8 inches thick.
      - 1) Stile and Rail Construction: Veneered, structural composite lumber. Select veneers for similarity of grain and color, and arrange for optimum match between adjacent pieces.



- 2) Raised-Panel Construction: Veneered, shaped, wood-based panel product with veneer conforming to raised-panel shape.
- c. 45-minute Fire-Rated Doors: 1-3/4-inch- thick, edged and veneered mineral-core stiles and rails and 1-1/8-inch- thick, veneered mineral-core raised panels.
  - 1) Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
- 7. Stile and Rail Widths: Manufacturer's standard, but not less than the following:
  - a. Stiles, Top and Intermediate Rails: 5 inches.
  - b. Bottom Rails: 10 inches.
- 8. Molding Profile (Sticking): Match existing.
- 9. Glass: Uncoated, clear, fully tempered float glass, 5.0 mm thick, complying with Division 08 Section "Glazing."

## **2.03 INTERIOR FIRE-RATED WOOD DOOR FRAMES**

- A. Interior Fire-Rated Wood Door Frames: Frames, complete with sidelite frames and casings, fabricated from solid fire-retardant-treated wood or from veneered fire-retardant particleboard, fire-retardant medium-density fiberboard, or mineral board.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Algoma Hardwoods, Inc.
    - b. Eggers Industries.
    - c. Maiman Company (The).
- B. Species: Match doors.

## **2.04 STILE AND RAIL WOOD DOOR FABRICATION**

- A. Fabricate stile and rail wood doors in sizes indicated for field fitting.
- B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:
  - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/2 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide not more than 3/8 inch from bottom of door to top of threshold.
    - a. Comply with NFPA 80 for fire-rated doors.
  - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
  - 3. Bevel fire-rated doors 1/8 inch in 2 inches on lock edge; trim stiles and rails only to extent permitted by labeling agency.
- C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W Series standards, and hardware templates.
  - 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- D. Glazed Openings: Trim openings indicated for glazing with solid wood moldings, with one side removable. Miter wood moldings at corner joints.
  - 1. Profile: Identical 5/8-inch square bead for non-rated, 20-minute, and 45-minute doors.
- E. Transom and Side Panels: Fabricate panels to match adjoining doors in materials, finish, and quality of construction.

## **2.05 FINISHING**

- A. Finish wood doors at factory.
- B. For doors indicated to be factory finished, comply with AWI's "Architectural Woodwork Quality Standards," and with other requirements specified.



1. Finish faces and all four edges of doors, including mortises and cutouts. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- C. Transparent Finish:
  1. Grade: Premium.
  2. Finish: AWI conversion varnish.
  3. Effect: Open-grain finish.
  4. Sheen: Semigloss.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine doors and substrates, with Installer present, for suitable conditions where wood stile and rail doors and fire-rated wood door frames will be installed.
  1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install fire-rated wood door frames level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
  1. Countersink fasteners, fill surface flush, and sand smooth.
- B. Hardware: For installation, see Division 08 Section "Door Hardware."
- C. Install wood doors to comply with manufacturer's written instructions, AWI's "Architectural Woodwork Quality Standards," and other requirements specified.
- D. Field-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/2 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.
    - a. Comply with NFPA 80 for fire-rated doors.
  2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
  3. Bevel fire-rated doors 1/8 inch in 2 inches on lock edge; trim stiles and rails only to extent permitted by labeling agency.
- E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- F. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

### **3.03 ADJUSTING**

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

## **END OF SECTION**



**SECTION 08 3113  
ACCESS DOORS AND FRAMES**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section includes access doors.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, fire ratings, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches (150 by 150 mm) in size.
- C. Product Schedule: For access doors and frames.

**PART 1 PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, according to NFPA 252 or UL 10B.

**2.02 ACCESS DOORS AND FRAMES**

- A. Access Door:
  - 1. Description: Upward swinging access door, with exposed flange and concealed hinge.
  - 2. Locations: Ceiling.
  - 3. Door Size: 24" x 36".
  - 4. Door and Trim: 16 gauge door, 16 gauge mounting frame, factory finished.
  - 5. Latch: Standard L handle, operable from both sides.
  - 6. Hinge: Concealed with coil spring for dampening.
  - 7. Fire-Resistance Rating: Not less than that of adjacent construction, 1 hour minimum, whichever is greater.
  - 8. Basis of Design: The Williams Bros. Corporation of America, "WB FR 850 Series Upward Swinging Access Door."

**2.03 MATERIALS**

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.
- C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- D. Frame Anchors: Same material as door face.
- E. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

**2.04 FABRICATION**

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.



- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
  - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
  - 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.
- D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling. Provide access sleeves for each latch operator and install in holes cut through finish.
  - 1. For recessed doors with plaster infill, provide self-furring expanded-metal lath attached to door panel.
- E. Latch and Lock Hardware:
  - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
  - 2. Keys: Furnish two keys per lock and key all locks alike.

## **2.05 FINISHES**

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
  - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
  - 2. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.
    - a. Color: white.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Comply with manufacturer's written instructions for installing access doors and frames.

### **3.03 ADJUSTING**

- A. Adjust doors and hardware, after installation, for proper operation.

## **END OF SECTION**



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**SECTION 08 4113**  
**ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes: Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
  - 1. Types of Aluminum Storefront Systems include:
    - a. Basis of Design: Kawneer Trifab™ 451UT Framing – 2" x 4-1/2" (50.8 mm x 114.3 mm) nominal dimension; Thermal; Center Plane, Screw Spline Fabrication.

**1.03 DEFINITIONS**

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

**1.04 PERFORMANCE REQUIREMENTS**

- A. Storefront System Performance Requirements:
  - 1. Wind loads: Provide storefront system; include anchorage, capable of withstanding wind load design pressures required by the Building Code of New York State.
  - 2. Air Leakage: The test specimen shall be tested in accordance with ASTM E 283. Air Leakage rate shall not exceed 0.06 cfm/ft<sup>2</sup> (0.3 l/s · m<sup>2</sup>) at a static air pressure differential of 6.2 psf (300 Pa) with interior seal, or, rate shall not exceed 0.06 cfm/ft<sup>2</sup> (0.3 l/s · m<sup>2</sup>) at a static air pressure differential of 1.6 psf (75 Pa) without interior seal. CSA A440 Fixed Rating.
  - 3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 10 psf (479 Pa) as defined in AAMA 501.
  - 4. Uniform Load: A static air design load of 30 psf (1436 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
  - 5. Seismic: When tested to AAMA 501.4, system must meet design displacement of 0.010 x the story height and ultimate displacement of 1.5 x the design displacement.
  - 6. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
    - a. Temperature Change (Range): 0 deg F (-18 deg C); 180 deg F (82 deg C).
    - b. Test Interior Ambient-Air Temperature: 75 deg F (24 deg C).
    - c. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum 3 cycles.
  - 7. Energy Efficiency:
    - a. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than the following:
      - 1) Fixed fenestration: 0.36.
      - 2) Operable fenestration: 0.43.
      - 3) Entrance doors: 0.77.
  - 8. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:



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- 
- a. 68frame and 68glass (low-e).
  - 9. Condensation Resistance (I): When tested to CSA A-440, the condensation index shall not be less than:
    - a. 60frame and 62glass (low-e).
  - 10. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:
    - a. 37 (STC) and 30 (OITC).

**1.05 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum-framed storefront system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed storefront.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
  - 1. Joinery.
  - 2. Anchorage.
  - 3. Expansion provisions.
  - 4. Glazing.
  - 5. Flashing and drainage.
- G. Other Action Submittals:
  - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
  - B. Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
  - C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.
  - D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements". Do not modify size and dimensional requirements.
    - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
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- E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

**1.07 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual dimensions of aluminum-framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

**1.08 WARRANTY**

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

**PART 1 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis-of-Design Product:
1. Kawneer Company Inc.
  2. Trifab™ 451UT Framing (Thermal)
  3. System Dimensions: 2" x 4-1/2" (50.8 mm x 114.3 mm)
  4. Glass: Center Plane

**2.02 MATERIALS**

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

**2.03 STOREFRONT FRAMING SYSTEM**

- A. Thermal Barrier (Trifab™ 451UT):
1. Kawneer DUAL Isolock™ Thermal Break with two (2) 1/4" (6.4 mm) separations consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
    - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.



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- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

**2.04 GLAZING SYSTEMS**

- A. Glazing: As specified in Division 08 Section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: As recommended by manufacturer for joint type, and as follows:
  - 1. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.

**2.05 ENTRANCE DOOR SYSTEMS**

- A. Entrance Doors: As specified in Division 08 4113 Section "Aluminum-Framed Entrances and Storefronts".
- B. Entrance Door Hardware: As specified in Division 08 4113 Section "Door Hardware".

**2.06 ACCESSORY MATERIALS**

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants".
- B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

**2.07 FABRICATION**

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles that are sharp, straight, and free of defects or deformations.
  - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
  - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
  - 4. Physical and thermal isolation of glazing from framing members.
  - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - 6. Provisions for field replacement of glazing.
  - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.



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- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- C. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- D. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

**2.08 ALUMINUM FINISHES**

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
  - 1. Kawneer Permanodic™ AA-M10C21A41 / AA-M45C22A41, AAMA 611, Architectural Class I Clear Anodic Coating.

**PART 1 EXECUTION****3.01 EXAMINATION**

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight aluminum-framed storefront installation.
  - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
  - 2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
  - 3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum-framed storefront system, accessories, and other components.
- B. Install aluminum-framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install aluminum-framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within aluminum-framed storefront system to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.



**3.03 FIELD QUALITY CONTROL**

- A. Field Tests: Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
  - 1. Testing: Testing shall be performed by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.
    - a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft<sup>2</sup>, whichever is greater.
    - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.2 psf (300 Pa).
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

**3.04 ADJUSTING, CLEANING, AND PROTECTION**

- A. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

**END OF SECTION**



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**SECTION 08 4114**  
**ALUMINUM-FRAMED ENTRANCES****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. This Section includes Kawneer Thermally Broken Aluminum Entrances (Basis-of-Design), glass and glazing, and door hardware and components.
  - 1. Types of Kawneer Thermally Broken Aluminum Entrances include:
    - a. 500T Insulpour™ Thermal Entrance; Wide stile, 5" (127 mm) vertical face dimension, 2-1/4" (57 mm) depth, high traffic applications.

**1.03 DEFINITIONS**

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

**1.04 PERFORMANCE REQUIREMENTS**

- A. General Performance: Aluminum-framed entrance doors shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
- B. Aluminum-Framed Entrance Performance Requirements:
  - 1. Wind loads: Provide entrance system; include anchorage, capable of withstanding wind load design pressures required by the Building Code of New York State, latest edition.
  - 2. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 1.57 psf (75 Pa) for pairs of doors. A single 3'0" x 7'0" (915 mm x 2134 mm) entrance door and frame shall not exceed 1.0 cfm/ft<sup>2</sup>. A pair of 6'0" x 7'0" (1830 mm x 2134 mm) entrance doors and frame shall not exceed 1.0 cfm per square foot.
  - 3. Uniform Load Deflection: A static air design load of;
    - a. 500T: 70.19 psf (3360 Pa) for single doors and 60.15 psf (2880 Pa) for pairs of doors.
  - 4. shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 for typical application or L/180 for Small-Missile and Large-Missile impact, of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
  - 5. Windborne-Debris-Impact Resistance Performance: 500T, Shall be tested in accordance with ASTM E1886, information in ASTM E1996, and TAS 201/203.
    - a. Large-Missile Impact: For aluminum-framed systems located within 30 feet (9.1m) of grade.
    - b. Small-Missile Impact: For aluminum-framed systems located above 30 feet (9.1 m) of grade.
  - 6. Forced Entry: Tested in accordance with AAMA 1304.
  - 7. Energy Efficiency:
    - a. Thermal Transmittance (U-factor): 0.77 maximum (per the International Energy Conservation Construction Code of New York State, latest edition).
    - b. Solar Heat-Gain Coefficient (SHGC) : Glazed thermally broken aluminum door and frame shall have a Solar Heat Gain Coefficient (SHGC) of no greater than 0.40 as determined according to NFRC 200.



**1.05 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, and fabrication methods, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed entrance door indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum-framed door and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed entrance doors.
- F. Fabrication Sample: Corner sample consisting of a door stile and rail, of full-size components and showing details of the following:
  - 1. Joinery, including welds.
  - 2. Glazing.
- G. Other Action Submittals:
  - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating thermally broken aluminum-framed entrance doors and storefronts that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports and calculations.
- C. Source Limitations: Obtain thermally broken aluminum-framed door through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed glass entrance doors and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements". Do not modify size and dimensional requirements.
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Pre-installation Conference: Conduct conference at Project site.

**1.07 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual dimensions of thermally broken aluminum-framed door openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

**1.08 WARRANTY**

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
  - 1. Warranty Period: Two (2) years from Date of Substantial Completion of the project.

**PART 1 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis-of-Design Product:
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1. Kawneer Company Inc.
  2. Vertical Stile Top Rail Bottom Rail
  3. 5" (127 mm) 5" (127 mm) 10" (254 mm)
  4. Major portions of the door members to be 0.188" (4.8 mm) nominal in thickness and glazing molding to be 0.05" (1.3 mm) thick
  5. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
  6. Provide adjustable glass jacks to help center the glass in the door opening.
- B. Subject to compliance with requirements, provide a comparable product by the following:
1. YKK AP Corp.
  2. EFCO Corporation.
- C. Substitutions: Refer to Section 01 6000 for procedures and submission requirements.

## 2.02 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum-framed door manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.188" (4.8 mm) wall thickness at any location for the main frame and door leaf members.
1. Recycled Content: Shall have a minimum of 50% mixed pre- and post-consumer recycled content.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum-framed door members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Slide-In-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
- F. Thermal Barrier: Shall be IsoPour™ utilizing two continuous rows of polypropylene with a nominal 7/32" (5.5 mm) separation consisting of a two-part, chemically curing high density polyurethane which is mechanically and adhesively bonded to the aluminum at door rails and stiles.

## 2.03 GLAZING

- A. Glazing: As specified in Division 08 Section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

## 2.04 HARDWARE

- A. General: Refer to Section 087100 for hardware requirements not specified in this section.
- B. Standard Hardware:
1. Weather-stripping:
    - a. Meeting stiles on pairs of doors shall be equipped with two lines of weather-stripping utilizing wool pile with polymeric fin.



- b. The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing and a wool pile with polymeric fin.
2. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (Necessary to meet specified performance tests).
3. Threshold: Extruded aluminum, thermally broken, with ribbed surface.

## 2.05 FABRICATION

- A. Fabricate thermally broken aluminum-framed entrance doors in sizes indicated. Include a complete system for assembling components and anchoring doors.
- B. Fabricate thermally broken aluminum-framed doors that are reglazable without dismantling perimeter framing.
  1. Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1" (25.4 mm) long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable cord.
  2. Accurately fit and secure joints and corners. Make joints hairline in appearance.
  3. Prepare components with internal reinforcement for door hardware.
  4. Arrange fasteners and attachments to conceal from view.
- C. Weather-stripping: Provide weather-stripping locked into extruded grooves in door panels or frames as indicated on manufactures drawings and details.

## 2.06 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
  1. Kawneer Permanodic™ AA-M10C21A41 / AA-M45C22A41, AAMA 611, Architectural Class I Clear Anodic Coating.

## PART 1 EXECUTION

### 3.01 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated installation.
  1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
  2. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
  3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing thermally broken aluminum-framed entrance doors, hardware, accessories, and other components.
- B. Install thermally broken aluminum-framed entrance doors level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill threshold in bed of sealant, as indicated, for weather tight construction.



- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

### **3.03 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Services: Provide periodic site visits by manufacturer's field service representative.

### **3.04 ADJUSTING, CLEANING, AND PROTECTION**

- A. Clean aluminum surfaces immediately after installing aluminum-framed door and storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

**END OF SECTION**



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**SECTION 08 5113**  
**ALUMINUM WINDOWS – DOUBLE-HUNG**

**PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section includes: Basis of Design: Kawneer Architectural Aluminum Windows including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units.
  - 1. Types of aluminum windows include:
    - a. Kawneer Series AA™5450 Ultra Thermal (Standard Face).
    - b. Side load double hung (AW-PG65-H), fixed (AW-PG70-FW).

**1.03 DEFINITIONS**

- A. Performance class designations according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):
  - 1. AW: Architectural Window
- B. Performance grade number according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):
  - 1. Design pressure number in pounds force per square foot used to determine the structural test pressure and water test pressure.
- C. Structural Test Pressure: For uniform load structural test, is equivalent to 150 percent of the design pressure.
- D. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).
- E. Minimum Test Size: Smallest gateway test size permitted for performance class. Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

**1.04 PERFORMANCE REQUIREMENTS**

- A. General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of minimum test size indicated below:
    - 1. Size required by AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) for minimum gateway performance.
    - 2. Test size: 60" x 99"
  - B. Structural Performance: Provide aluminum windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for the Project that pass AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Structural Test:
    - a. Design Wind Loads: as required per the Building Code of New York State.
    - 2. Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch (19 mm), whichever is less, at design pressure based on testing performed according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Deflection Test or structural computations.
  - C. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the maximum change in ambient and surface temperatures in the project's location by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - D. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, with a CRF not less than 71 (frame) and 76 (glass).
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- E. Temperature Index (I): Provide aluminum windows tested for thermal performance according to CSA-A440 with a Temperature Index not less than 40 (frame), 74 (glass).
  - F. Energy Efficiency:
    - 1. Thermal Transmittance Test (U-Factor): When tested to AAMA specification 1503, AAMA specification 507 or NFRC 100 the thermal transmittance (U-Factor) shall not be more than:
      - a. Fixed fenestration: 0.36.
      - b. Operable fenestration: 0.43.
  - G. Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a maximum whole-window SHGC of 0.40 as determined according to NFRC 200 and AAMA 507 procedures.
  - H. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Air Infiltration Test.
    - 1. Maximum Rate: 0.3 cfm/sq. ft. (0.5 L/s•m<sup>2</sup>) of area at an inward test pressure of 6.24 lbf/sq. ft. (300 Pa) in accordance with ASTM E283.
  - I. Water Resistance: No water leakage as defined in AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) referenced test methods at a water test pressure equaling that indicated, when tested according to ASTM E547 and ASTM E331.
    - a. Test Pressure: 20 percent of positive design pressure, but not more than 10 lbf/sq. ft. (478 Pa) with a 10 lb. sill or 15 lbf/sq. ft. (720 Pa) with a 15 lb. sill.
  - J. Forced-Entry Resistance: Comply with Performance Grade 10 requirements when tested according to ASTM F 588.
  - K. Life-Cycle Testing: Test according to AAMA 910 and comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
  - L. Operating Force and Auxiliary (Durability) Tests: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) for operating window types indicated.

#### 1.05 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum window indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum windows and components required.
- E. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.
- G. Maintenance Data: For operable sash, operating hardware and finishes to be include in maintenance manuals.

#### 1.06 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.
  - B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
  - C. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.
-



- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

### **1.07 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual dimensions of aluminum framed window openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

### **1.08 WARRANTY**

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
  - 1. Warranty Period: Two (2) years from Date of Substantial Completion.

## **PART 1 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis-of-Design Product:
  - 1. Kawneer Company Inc.
  - 2. Series AA™5450 Ultra Thermal (Standard Face).
  - 3. 4 5/8" frame depth.
  - 4. Side load double hung (AW-PG65-H), fixed (AW-PG70-FW).

### **2.02 MATERIALS**

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and sash members.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- E. Sliding-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
  - 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
- F. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

### **2.03 WINDOW**

- A. Window Type: Double Hung Window, and fixed windows.
- B. Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
  - 1. Performance Class and Grade:
    - 1) Double hung: AW-PG65-H.



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2) Fixed: AW-PG70-FW.

## 2.04 GLAZING

- A. Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- B. Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads and an interior gasket in accordance with AAMA 702 or ASTM C864.

## 2.05 HARDWARE

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.
- B. Double Hung Windows: Provide the following operating hardware:
  - 1. Sash Balances: A Class 5 adjustable spiral balance with stainless steel or other corrosion-resistant components. Two per sash.
  - 2. Handle: Continuous, integral, bottom and top sash lift handle.
  - 3. Sash Lock: White bronze sweep lock and keeper on meeting rails. One or two per sash as required by size. Brushed nickel finish.
  - 4. Aluminum autolock at top sash lift handle.
  - 5. Limit Device: Sash stop limit device; for bottom and top sash located at jamb; two per sash. Locate as directed by Owner.

## 2.06 EXTERNAL MUNTINS

- A. Hollow extruded aluminum, finish to match the window system. The insulated unit thickness remains as nominal 1".

## 2.07 INSECT SCREENS

- A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Fabricate insect screens to fully integrate with window frame. Locate screens on outside of window and provide for each operable exterior sash. Do not provide screens at Rescue Windows.
  - 1. Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," for minimum standards of appearance, fabrication, attachment of screen fabric, hardware, and accessories unless more stringent requirements are indicated.
- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners and removable PVC spline.
  - 1. Extruded-Aluminum or Aluminum Tubular Framing Sections and Cross Braces: Not less than 0.050-inch (1.3-mm) wall thickness.
  - 2. Finish: Manufacturer's standard.
- C. Aluminum Wire Fabric: 18-by-16 mesh/inch (18-by-16 mesh/25.4mm) of 0.011-inch (0.28-mm) diameter, coated aluminum wire.
  - 1. Wire-Fabric Finish: Charcoal Grey.

## 2.08 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
    - 1. Profiles that are sharp, straight, and free of defects or deformations.
    - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
    - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
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4. Physical and thermal isolation of glazing from framing members.
  5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  6. Provisions for field replacement of glazing.
  7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
  - C. Fabricate aluminum windows that are re-glazable without dismantling sash or framing.
  - D. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
    1. Frame thermal barrier shall be polyamide with a minimum of 1" (25.4 mm) separation, installed continuously and mechanically bonded to the aluminum.
    2. Sash thermal barrier shall be polyamide with a minimum of 1/2" (12 mm) separation, installed continuously and mechanically bonded to the aluminum.
  - E. Weather Stripping: Provide full-perimeter weather stripping for each operable sash.
  - F. Weep Holes: Provide weep holes and internal passages in window frames to conduct infiltrating water to exterior.
  - G. Provide water-shed members as required above lines of natural water penetration.
  - H. Mullions: Provide mullions and cover plates as indicated (if not indicated, provide as required for a complete installation), matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design loads of window units.
  - I. Sub frames: Provide sub frames with anchors for window units, of profile and dimensions required but not less than 0.093-inch (2.4-mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.
  - J. Factory-Glazed Fabrication: Glaze aluminum windows in the factory. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
  - K. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash.
  - L. Rescue Window Labels: Apply labels to be readable from both sides of the window and window coverings.
    1. Text: "RESCUE WINDOW".
      - a. Size: 3-inches high by 5-inches wide.
      - b. Colors: Bright yellow background with black letters.
      - c. Location: As indicated on the drawings, but not less than one label per room.

## 2.09 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
  - B. Factory Finishing:
    1. Kawneer Permanodic™ AA-M10C21A41 / AA-M45C22A41, AAMA 611, Architectural Class I Clear Anodic Coating.
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**PART 1 EXECUTION****3.01 EXAMINATION**

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
  - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
  - 2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
  - 3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- B. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant for weather tight construction.
- D. Install aluminum framed window systems and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

**3.03 FIELD QUALITY CONTROL**

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
  - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
  - 1. Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.
    - a. Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.
    - b. Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.
  - 2. Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
  - 3. Test Reports: Shall be prepared according to AAMA 502.



**3.04 ADJUSTING, CLEANING, AND PROTECTION**

- A. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.
- B. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

**3.05 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain window operating system. Refer to Division 01 Section "Demonstration and Training."

**END OF SECTION**



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**SECTION 087100  
DOOR HARDWARE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including general and supplementary conditions and division 01 specification sections, apply to this section.

**1.2 SUMMARY**

- A. Section includes:
  - 1. Mechanical and electrified door hardware for swinging doors
  - 2. Field verification, preparation and modification of existing doors and frame to receive new door hardware.
- B. Hardware shall comply with New York State Education Department 1998 Edition of the Manual of Planning Standards, Section S105 – Door Hardware, and NFPA 101-Life Safety Code.

**1.3 RELATED SECTIONS:**

- A. Division 08 Section "Hollow Metal doors and Frames"
- B. Division 08 Section "Flush Wood Doors"
- C. Division 08 Section "Aluminum-framed Entrances and Storefronts"
- D. Division 08 Section "FRP Doors and Aluminum Frames"
- E. Division 26 Section "Electrical"
- F. Division 28 Section "Fire Detection and Alarm"
- G. Division 28 section "access control" for access control devices installed at door openings and provided as part of a security system.

**1.4 SUBMITTALS**

- A. Product data: for each item of hardware indicated furnish manufacturer's catalog sheets highlighting information pertaining specifically to product(s) submitted. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop drawings: details of electrified door hardware, indicating the following:
  - 1. Wiring diagrams: for power, signal, and control wiring and including the following:
    - a. Details of interface of electrified door hardware and building safety and security systems.
  - 2. Operation narrative: describe the operation of doors controlled by electrified door hardware.
- C. Other action submittals:



1. Door hardware schedule: prepared by or under the supervision of installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
    - a. Format: comply with scheduling sequence and vertical format in dhi's "sequence and format for the hardware schedule." double space entries, and number and date each page.
    - b. Content: include the following information:
      - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
      - 2) Locations of each door hardware set, cross-referenced to drawings on floor plans and to door and frame schedule.
      - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
      - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
      - 5) Fastenings and other pertinent information.
      - 6) Explanation of abbreviations, symbols, and codes contained in schedule.
      - 7) Mounting locations for door hardware.
      - 8) List of related door devices specified in other sections for each door and frame.
      - 9) Door index – cross referencing door number with page and/or set number. If the sets are not in numerical order the door number, set number and page number are required. The hardware set number shown on a door submittal does not qualify as the door index for hardware.
  2. Keying schedule: prepared by or under the supervision of installer, detailing owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the contract documents.
- D. Qualification data: for installer and architectural hardware consultant.
- E. Product certificates: for electrified door hardware, from the manufacturer.
1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- F. Product test reports: for compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
- G. Maintenance data: for each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.
- H. Warranty: special warranty specified in this section.

## 1.5 QUALITY ASSURANCE

- A. Installer qualifications: supplier of products and an employer of workers trained and approved by product manufacturers and an architectural hardware consultant who is available during the course of the work to consult with contractor, architect, and owner about door hardware and keying.



- B. Architectural hardware consultant qualifications: a person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this project.
- C. Source limitations: obtain each type of door hardware from a single manufacturer.
- D. Fire-rated door assemblies: where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10c, unless otherwise indicated.
- E. Smoke- and draft-control door assemblies: where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
  - 1. Air leakage rate: maximum air leakage of 0.3 cfm/sq. Ft. At the tested pressure differential of 0.3-inch wg of water.
- F. Electrified door hardware: listed and labeled as defined in NFPA 70, article 100, by a testing agency acceptable to authorities having jurisdiction.
- G. Means of egress doors: latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- H. Accessibility requirements: for door hardware on doors in an accessible route, comply with the U.S. Architectural & transportation barriers compliance board's ADA-aba accessibility guidelines and icc/ansi a117.1.
  - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
  - 2. Comply with the following maximum opening-force requirements:
    - a. Interior, non-fire-rated hinged doors: 5 lbf applied perpendicular to door.
    - b. Sliding or folding doors: 5 lbf applied parallel to door at latch.
    - c. Fire doors: minimum opening force allowable by authorities having jurisdiction.
  - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
  - 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- I. Keying conference: conduct conference at project site to comply with requirements in division 01 section "project management and coordination." incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
  - 1. Plans for future expansion.
  - 2. Preliminary key system schematic diagram.
  - 3. Requirements for key control system.
  - 4. Requirements for access control.
  - 5. Address for delivery of keys.
- J. Pre-installation conference: conduct conference at project site.



1. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

## **1.7 COORDINATION**

- A. Installation templates: distribute for doors, frames, and other work specified to be factory prepared. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: coordinate installation of door hardware, keying, and access control with owner's security consultant.
- C. Electrical system roughing-in: coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- D. Existing openings: where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

## **1.8 WARRANTY**

- A. Special warranty: manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
  2. Structural failures including excessive deflection, cracking, or breakage.
  3. Faulty operation of doors and door hardware.
  4. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
- B. Warranty period: three years from date of substantial completion, unless otherwise indicated.
  1. Exit devices: three years from date of substantial completion.
  2. Manual closers: 25 years from date of substantial completion.
  3. Locksets: 10 years from date of substantial completion.
  4. Continuous hinges: lifetime of opening



## **1.9 MAINTENANCE SERVICE**

- A. Maintenance tools and instructions: furnish a complete set of specialized tools and maintenance instructions for owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## **PART 2 - PRODUCTS**

### **1.10 SCHEDULED DOOR HARDWARE**

- A. Provide door hardware for each door as scheduled on drawings with hardware sets scheduled in part 3 "door hardware schedule" article to comply with requirements in this section.
  - 1. Door hardware sets: provide quantity, item, size, finish or color indicated, and named manufacturers' products.
  - 2. Sequence of operation: provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in part 3 "door hardware schedule" article. Products are identified by using door hardware designations, as follows:
  - 1. Named manufacturers' products: manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements.

### **1.11 HINGES**

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Stanley Commercial Hardware; a Dormakaba Holding, Inc. Company
    - b. McKinney Products Company; an ASSA ABLOY Group Company.
    - c. Hager Companies.

### **1.12 CONTINUOUS HINGES**

- A. Continuous hinges: BHMA A156.26; minimum 0.120-inch- thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.
- B. Continuous, gear-type hinges: extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Select Products, Ltd.
    - b. Pemko Mfg. Co; an Assa Abloy Group Company



- c. Hager Companies.

### **1.13 MECHANICAL LOCKS AND LATCHES**

- A. Lock functions: as indicated in door hardware schedule.
- B. Lock throw: comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
  - 1. Bored locks: minimum 1/2-inch latchbolt throw.
  - 2. Mortise locks: minimum 3/4-inch latchbolt throw.
  - 3. Deadbolts: minimum 1-inch bolt throw.
- C. Lock backset: 2-3/4 inches, unless otherwise indicated.
- D. Lock trim:
  - 1. Description: as indicated in door hardware schedule
  - 2. Levers: zinc alloy
  - 3. Escutcheons (roses): wrought
- E. Strikes: provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
  - 1. Flat-lip strikes: for locks with three-piece antifriction latch bolts, as recommended by manufacturer.
  - 2. Extra-long-lip strikes: for locks used on frames with applied wood casing trim.
- F. Bored locks: BHMA A156.2; grade 1; series 4000.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Best Access Systems; a Dormakaba Holding, Inc. Company (to match existing)

### **1.14 ELECTRIC STRIKES**

- A. Electric strikes: BHMA A156.31; grade 1; with faceplate to suit lock and frame.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. HES; an ASSA ABLOY Group Company.
    - b. Trine Access Technology.
    - c. Von Duprin; an Allegion Company.

### **1.15 MANUAL FLUSH BOLTS**

- A. Manual flush bolts: BHMA A156.16; minimum 3/4-inch throw; designed for mortising into door edge.



1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
  - a. Rockwood; an ASSA ABLOY Group Company
  - b. Door Controls International, Inc.
  - c. Ives Hardware; an Ingersoll-Rand Company.

#### **1.16 AUTOMATIC AND SELF-LATCHING FLUSH BOLTS**

- A. Automatic and self-latching flush bolts: BHMA A156.16; minimum 3/4-inch throw; designed for mortising into door edge.
1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
  - a. Rockwood; an ASSA ABLOY Group Company
  - b. Ives Hardware; an Ingersoll-Rand Company.
  - c. Door Controls International, Inc.

#### **1.17 EXIT DEVICES AND AUXILIARY ITEMS**

- A. Exit devices and auxiliary items: BHMA A156.3.
  1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Von Duprin; an Allegion Company
    - b. Precision Hardware, Inc.; a Dormakaba Holding, Inc. Company
    - c. Sargent Manufacturing Company; an ASSA ABLOY Group Company.
- B. Power Transfers:
  1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Von Duprin; an Allegion Company
    - b. ABH; Architectural Builders Hardware Manufacturing, Inc.
    - c. Securitron; an ASSA ABLOY Group Company.

#### **1.18 LOCK CYLINDERS**

- A. Lock cylinders: tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Best Access Systems; a Dormakaba Holding, Inc. Company (to match existing)
- B. Standard lock cylinders: BHMA A156.5; grade 1; permanent cores that are interchangeable; face finished to match lockset.
- C. Construction cores: provide cylinders with keyed alike construction cores. Cores shall be painted a color for easy identification (blue, orange, etc.). Construction cores shall be



returned to the hardware supplier. Provide 10 construction master keys and two construction control keys for removing temporary cores.

- D. Provide final permanent cores with visual key control. Stamp keys and (in a concealed location) stamp cores with keyset symbol.

### **1.19 KEYING**

- A. Keying system: factory registered, integrated with existing Best access control key system, complying with guidelines in BHMA A156.28, appendix a. Incorporate decisions made in keying conference.
  - 1. Existing system:
    - a. Master key or grand master key locks to owner's existing Best Access Systems key system.
- B. Keys: nickel silver.
  - 1. Stamping: permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "do not duplicate."
  - 2. Quantity: in addition to one extra key blank for each lock, provide the following unless otherwise directed by owner:
    - a. Cylinder change keys: three.
    - b. Master keys: five.
    - c. Grand master keys: five.
    - d. Great-grand master keys: five.

### **1.20 KEY CONTROL SYSTEM**

- A. Key control cabinet: BHMA A156.5; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.
  - 1. Manufacturers: subject to compliance with requirements, provide products by one of the following:
    - a. Tel-Kee
    - b. HPC, Inc.
    - c. Lund Equipment Co., Inc.
    - d. MMF Industries.

### **1.21 ACCESSORIES FOR PAIRS OF DOORS**

- A. General: provide accessories for pairs of doors as indicated on schedule.



- B. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; and with internal override.
- C. Carry-open bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.
- D. Astragals: BHMA A156.22.

## **1.22 SURFACE CLOSERS**

- A. Surface closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. LCN Closers; an Allegion Company.
    - b. Sargent Manufacturing Company; an ASSA ABLOY Group Company.
    - c. Dorma Architectural Hardware; a Dormakaba Holding, Inc. Company

## **1.23 MECHANICAL STOPS AND HOLDERS**

- A. Wall- and floor-mounted stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Rockwood; an ASSA ABLOY Group Company
    - b. Burns Manufacturing Incorporated.
    - c. Ives Hardware; an Allegion Company.

## **1.24 ELECTROMAGNETIC STOPS AND HOLDERS**

- A. Electromagnetic door holders: BHMA A156.15, grade 1; wall-mounted or floor-mounted electromagnet unit with strike plate attached to swinging door; coordinated with fire detectors and interface with fire alarm system for labeled fire-rated door assemblies.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Rixson; an ASSA ABLOY Group Company
    - b. Architectural Builders Hardware Mfg., Inc.
    - c. LCN Closers; an Allegion Company



## **1.25 OVERHEAD STOPS AND HOLDERS**

- A. Overhead stops and holders: BHMA A156.8.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Glynn-Johnson; an Ingersoll-Rand Company.
    - b. Sargent Manufacturing Company; an ASSA ABLOY Group Company.
    - c. Architectural Builders Hardware Mfg., Inc.

## **1.26 DOOR GASKETING**

- A. Door gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Pemko Manufacturing Co.; an ASSA ABLOY Group Company.
    - b. National Guard Products.
    - c. Zero International; an Allegion Company

## **1.27 THRESHOLDS**

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Pemko Manufacturing Co.; an ASSA ABLOY Group Company.
    - b. National Guard Products.
    - c. Zero International; an Allegion Company

## **1.28 SLIDING DOOR HARDWARE**

- A. Sliding door hardware: BHMA A156.14; consisting of complete sets including rails, hangers, supports, bumpers, floor guides, and accessories indicated.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Stanley Commercial Hardware; a Dormakaba Holding, Inc. Company
    - b. Hager Companies.
    - c. Henderson, PC Inc.
    - d. Johnson, L. E., Products, Inc.



## **1.29 FOLDING DOOR HARDWARE**

- A. General: BHMA A156.14; complete sets including overhead rails, hangers, supports, bumpers, floor guides, and accessories indicated.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Stanley Commercial Hardware; a Dormakaba Holding, Inc. Company
    - b. Hager Companies.
    - c. Henderson, PC Inc.
    - d. Johnson, L. E., Products, Inc.

## **1.30 METAL PROTECTIVE TRIM UNITS**

- A. Metal protective trim units: BHMA A156.6; fabricated from 0.050-inch- thick stainless steel as scheduled; with four beveled edges and countersunk screw holes with manufacturer's standard machine or self-tapping screw fasteners.
  - 1. Basis-of-design product: subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
    - a. Rockwood; an ASSA ABLOY Group Company
    - b. Burns Manufacturing Incorporated.
    - c. Ives Hardware; an Allegion Company.

## **1.31 FABRICATION**

- A. Manufacturer's nameplate: do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by architect.
  - 1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base metals: produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- C. Fasteners: provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted.
  - 1. Fire-rated applications:
    - a. Wood or machine screws: for the following:
      - 1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
      - 2) Strike plates to frames.
      - 3) Closers to doors and frames.
    - b. Steel through bolts: do not use through bolts for installation where bolt head or nut on opposite face is exposed unless noted or it is the only means of securely attaching the door hardware and approved by architect.



- 1) Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
  - 2) Verify that blocking is provide for the following:
    - a) Surface hinges to doors.
    - b) Closers to doors and frames.
    - c) Surface-mounted exit devices.
  - c. Spacers or sex bolts: for through bolting of hollow-metal doors.
2. Fasteners for wood doors: comply with requirements in DHI wdhs.2, "recommended fasteners for wood doors."
  3. Gasketing fasteners: provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

### **1.32 FINISHES**

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of finished work: variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

## **PART 2 - EXECUTION**

### **1.33 EXAMINATION**

- A. Examine doors and frames, with installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **1.34 PREPARATION**

- A. Steel doors and frames: for surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood doors: comply with DHI WDHS.5 "Recommended hardware reinforcement locations for mineral core wood flush doors."



### 1.35 INSTALLATION

- A. Mounting heights: mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard steel doors and frames: ANSI/SDI A250.8.
  - 2. Wood doors: DHI WDHS.3, "Recommended locations for architectural hardware for wood flush doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in division 09 sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards. Hand tighten screws and fasteners, use of power tools must be limited to preliminary driving screws if permitted by the door and hardware manufacturer.
- C. Hinges: install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Door closers shall be installed to obtain the greatest degree swing allowed by field conditions. Follow manufacturer's instructions for proper door closer adjustment for spring power, back check, closing and latching speed.
- E. Lock cylinders: install construction cores to secure building and areas during construction period.
  - 1. Replace construction cores with permanent cores as indicated in keying schedule.
- F. Key control system: tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- G. Provide and install all low voltage control wiring from power supply to all door hardware. Provide and install 120v power wiring from EC-provided junction box to power supply (supplied under this section). Provide wiring as recommended by device manufacturer.
- H. Boxed power supplies: locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with architect.
  - 1. Configuration: provide one power supply for each door opening with electrified door hardware unless otherwise specified
- I. Thresholds: set thresholds for exterior and interior doors in full bed of sealant complying with requirements specified in division 07 section "joint sealants."
- J. Stops: provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- K. Perimeter gasketing: apply to head and jamb, forming seal between door and frame.



- L. Meeting stile gasketing: fasten to meeting stiles, forming seal when doors are closed.
- M. Door bottoms: apply to bottom of door, forming seal with threshold when door is closed.

### **1.36 ADJUSTING**

- A. Initial adjustment: adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Electric strikes: adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  - 2. Door closers: adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy adjustment: approximately three months after date of substantial completion, installer's architectural hardware consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

### **1.37 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of substantial completion.

### **1.38 DOOR HARDWARE SCHEDULE**

- A. Supplier shall assume full responsibility for examination of the drawings and shall be responsible for the accuracy of the quantities, size, finish and proper hardware whether specifically mentioned or not. Hardware not listed specifically must be furnished to match other hardware in similar openings.
- B. Provide all required accessories and options necessary for complete installation of each hardware component, to ensure proper operation of the product.
- C. Hardware for aluminum doors shall be shipped to the door manufacturer's factories for installation with the exception of door closers and thresholds, if required or requested.
- D. All existing conditions shall be verified prior to the submission of the hardware schedule. It shall be noted on the hardware submittal that this requirement has been met.
- E. Where frames are existing to remain the door thickness shall be verified.
- F. GC is to confirm the salvage status of all removed hardware with the Owner prior to disposal. Turn over to Owner any hardware items identified for salvage and dispose of the balance.
- G. HARDWARE CODES:



Hinges for exterior aluminum doors based on specified Kawneer 500T doors. Coordinate with supplier if other than Kawneer furnished.

001	1 ea.	continuous hinge SL-11HD Clear Anodized
001A	1 ea.	continuous hinge SL-11HD Clear Anodized - Prep EPT
101	1 ea.	continuous hinge SL-24HD Clear Anodized
102	3 ea.	hinges FBB168 US26D 4-1/2 x 4-1/2
102A	3 ea.	hinges FBB168 US26D 5 x 4-1/2
103	3 ea.	hinges FBB179 US26D 4-1/2 x 4-1/2
103A	3 ea.	hinges FBB191 US32D 4-1/2 x 4-1/2
104	3 ea.	ball bearing hinges US26D to match size and thickness of existing frame cutout
105	3 ea.	ball bearing hinges US32D to match size and thickness of existing frame cutout

200	1 ea.	closer (pull side) 4011 MC AL x TB
200A	1 ea.	closer (pull side stop arm) 8916 IS FMC SN1 689
201	1 ea.	closer (push side) 4111EDA MC AL x TB
202	1 ea.	closer (push side stop arm) 4111CUSH MC AL x TB
203	1 ea.	closer (push side stop hold open arm) 4111H-CUSH MC AL x TB
204	1 ea.	electrohydraulic automatic operator Gyrotech by Nabco GT-710-01 Clear Anodized - Top jamb mount on pull side
204A	1 ea.	electrohydraulic automatic operator Gyrotech by Nabco GT-710-02 Clear Anodized - Top jamb mount on push side
205	1 ea.	wall mounted actuator switch Wikk 4x4-3 Mobile Logo
206	1 ea.	surface box for actuator switch Wikk 4Nx4S

Note: Handicap operators to be turned "off" when door is needed to be in the locked position where actuators are located in the corridor.

Note: Install door stop provided with handicap operators at desired position allowed by field conditions.

Note: Provide drop plates, long arms, shoe support and spacers, as required.

300	1 ea.	rim exit device 98L-NL-F x 996L-R x 06 US26D SNB (Fire Rated--Key retracts latch bolt)
300A	1 ea.	rim exit device 98NL x 697NL US26D SNB (Key retracts latch bolt)
300B	1 ea.	rim exit device 98EO US26D SNB
301	1 ea.	surface vertical rod exit device 9827L-F x 996L-V x 06 LBR US26D SNB (Key locks and unlocks outside lever)
302	1 ea.	surface vertical rod exit device 9827EO-F LBR US26D SNB (Exit Only)
303	1 ea.	surface vertical rod exit device 9827L-BE-F LBR US26D SNB (Passage, No cylinder)
304	1 ea.	rim exit device HD-QEL35A-NL-OP US26D with motorized latch retraction & hex key dogging
305	1 ea.	rim exit device CD35A-NL-OP US26D
306	1 ea.	rim exit device CD35A-EO US26D
307	1 ea.	keyed removable mullion KR4954 SP28



308 1 ea. power transfer EPT-10 SP28  
309 1 ea. power supply PS902 x 900-2RS x 900-BBK with batteries  
Note: LBR = less bottom rod - fire bolt assembly must be installed in lower door edge at fire rated doors

400 1 ea. rim cylinder 12E72 or mortise 1E74, as required 626  
400A 1 ea. Best keyed construction core 626 for mortise lock  
401 1 ea. lockset (classroom) 9K3-7R15D 626  
402 1 ea. lockset (storeroom) 9K3-7D15D 626  
403 1 ea. passage 9K3-0N15D 626  
404 1 ea. privacy 9K3-0L15D 626  
405 1 ea. lockset (dormitory/lockdown) 9K3-7T15D 626  
406 1 ea. mortise lockset (keyed restroom) Sargent V20-LB-70-8225OL US26D  
with ADA thumbturn & occupancy indicator (Occupied/Vacant)  
Note: Locked/Unlocked not acceptable  
(Key outside allows door to remain in either locked or unlocked position,  
inside lever always free to exit)

Note: Provide 3/4" throw latch at Pairs of Doors.

500 1 set combination flush bolts 2845 US32D x 570 dust strike US26D  
500A 1 set automatic flush bolts 2842 for HM, 2962 for WD US32D x 570 dust strike US26D  
501 1 ea. coordinator 2600 Series US28 x Mtg. Brackets as required  
502 2 ea. manual flush bolts 555 US26D x 570 dust strike  
503 3 ea. silencers 608 @ Sgl. Drs., 2 @ Pair Drs.  
504 1 ea. wall bumper 406 @ exit devices, 409 @ locksets US32D or floor stop 441 US26D  
505 1 ea. overhead surface stop GJ450S Series US32D

600 1 ea. kick plate K1050 8" x 2"LDW @ Sgl. Drs., 8" x 1"LDW @ Pair Doors  
US32D .050 B4E x countersunk screw holes  
601 1 ea. door pull BF157 - 1" diameter x 10" CTC US32D  
602 Not used  
603 1 ea. wrap around plate Don-Jo 9K-CW-S

700 1 ea. smoke seal S44C Clear for H&J  
700A 1 ea. smoke seal S771C Clear for Meeting Stile  
701 1 ea. smoke seal 316AS x Tek for H&J  
702 1 ea. door sweep 315CN x Tek  
703 1 set weatherstrip for Meeting Stile, H&J by Section 081114  
704 1 ea. mullion gasketing 5110BL  
705 1 set weatherstrip 332CS x Tek for H&J  
706 2 ea. meeting stile gasketing 316AS x Tek

800 1 ea. aluminum threshold 252x2AFG - 1/2"H x 4-1/8"W x MSES25SS  
801 1 ea. aluminum threshold 253x3AFG - 1/2"H x 6-1/8"W x MSES25SS  
802 1 ea. aluminum threshold 276A - 1/4"H x 7"W x MS10SS (Verify width in field)



900 1 ea. electric strike HES 1006 x 2005M3 24VDC Fail Secure 630

901 1 ea. power supply Securitron BPS-24 x B-24-5

Note: For single toilet rooms where an electric strike is specified for a mortise lock with an actuator on the corridor side provide the faceplate of the electric strike which will not release when the deadbolt is extended.

Note: Electric strikes to be wired to output of handicap operators. Operators to be wired to the fire alarm system to cut power to operator on fire alarm mode. If operator furnished does not have an output for the electric strike provide Code 901 power supply

1000 1 ea. access control and/or remote release by others

#### H. DOORS/CODES:

	<u>COLUMBUS ELEMENTARY SCHOOL (CCS)</u>
<u>SET CC-1</u>	
1-010	102-204A-205-206-401-600-700-900
1-019	102-204A-205-206-401-600-700-900
1-110	102-204A-205-206-401-600-700-900
1-119	102-204A-205-206-401-600-700-900
1-210	102-204A-205-206-401-600-700-900
1-219	102-204A-205-206-401-600-700-900
<u>SET CC-2</u>	
1-113A	103-401-503-504
1-118A	103-401-503-504
<u>SET CC-3</u>	
2-010	103-402-503-504-600
2-110	103-402-503-504-600
2-119	103-402-503-504-600
2-210	103-402-503-504-600
2-219	103-402-503-504-600
	<u>CLINTON ELEMENTARY SCHOOL (CES)</u>
<u>SET CE-1</u>	
1-007	102-204-205-206-401-600-700-900
1-104	102-204-205-206-401-600-700-900
<u>SET CE-2</u>	
1-105	102-204-205-206-400A-406-600-700-900
<u>SET CE-3</u>	



1-204	102-200-401-504-600-700
<u>SET CE-4</u>	
1-016	102-200A-401-600-700
1-120	102-200A-401-600-700
1-211	102-200A-401-600-700
<u>SET CE-5</u>	
1-200A	102-200A-402-600-700
<u>SET CE-6</u>	
1-011	102-202-300-400-600-700
<u>SET CE-7</u>	
2-007	103-402-503-504-600
2-104	103-402-503-504-600
2-120	103-402-503-504-600
2-211	103-402-503-504-600
<u>SET CE-8</u>	
2-016	103-402-503-505-600
<u>SET CE-9</u>	
1-115A	103-405-503-504
<u>SET CE-10</u>	
1-111A	103-405-503-505
1-114A	103-405-503-505
<u>SET CE-11</u>	
1-200 (2)	2/101-2/202-2/303-2/600-700A-701
<u>SET CE-12</u>	
1-125 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
2-125 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
<u>SET CE-13</u>	
3-025 (2)	2/101-2/202-301-302-400-2/600-700A-701
4-025 (2)	2/101-2/202-301-302-400-2/600-700A-701



	<u>SMITH EARLY LEARNING CENTER (ELC)</u>
<u>SET EL-1</u>	
1-210	102-204-205-206-405-600-700-900
<u>SET EL-2</u>	
1-006	102-204A-205-206-401-600-700-900
1-007	102-204A-205-206-401-600-700-900
<u>SET EL-3</u>	
1-032	102-200A-400A-406-600-700
1-033	102-200A-400A-406-600-700
<u>SET EL-4</u>	
1-118	102-200A-401-600-700
1-119	102-200A-401-600-700
1-214	102-200A-401-600-700
1-215	102-200A-401-600-700
<u>SET EL-5</u>	
1-209	102-200-400A-406-504-600-700
<u>SET EL-6</u>	
1-017	102A-202-300-400-600-700
<u>SET EL-7</u>	
2-007(2)	2/103-402-502-503-2/505
<u>SET EL-8</u>	
2-006	103-402-503-504
<u>SET EL-9</u>	
1-102	103-405-503-504
1-104	103-405-503-504
<u>SET EL-10</u>	
1-106	405-603
1-111	405-603
	<u>KRIEGER ELEMENTARY SCHOOL (KES)</u>
<u>SET KE-1</u>	
1-106	102A-204A-205-206-401-600-700-900
1-137	102A-204A-205-206-401-600-700-900



1-204	102A-204A-205-205-401-600-700-900
1-219	102A-204A-205-205-401-600-700-900
<u>SET KE-2</u>	
1-112A	102-204-205-206-405-503-600-900
<u>SET KE-3</u>	
1-100	103-201-401-504-600-700
<u>SET KE-4</u>	
1-112B	103-405-503-504
1-120A	103-405-503-504
<u>SET KE-5</u>	
1-142	104-405-504
1-224	104-405-504
	<u>MORSE ELEMENTARY SCHOOL (MES)</u>
<u>SET ME-1</u>	
1-F-16A	102-204-205-206-401-600-700-900
1-S-21A	102-204-205-206-401-600-700-900
<u>SET ME-2</u>	
1-B-2A	102-200A-400A-406-600-700
1-B-6A	102-200A-400A-406-600-700
<u>SET ME-3</u>	
1-F-3A	102-200-401-504-600-700
<u>SET ME-4</u>	
1-S-17A	102-200A-401-600-700
<u>SET ME-5</u>	
2-B-2A	103-201-402-504-600-700
2-B-6A	103-201-402-504-600-700
2-F-3A	103-201-402-504-600-700
2-F-16A	103-201-402-504-600-700
2-S-17A	103-201-402-504-600-700
2-S-21A	103-201-402-504-600-700
<u>SET ME-6</u>	
1-F-5B	103-405-503-504
1-F-14C	103-405-503-504
1-F-15A	103-405-503-504



1-S-14B	103-405-503-504
1-S-18C	103-405-503-504
<u>SET ME-7</u>	
1-F-6 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
2-F-6 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
3-F-6 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
	<u>POUGHKEEPSIE HIGH SCHOOL (PHS)</u>
<u>SET HS-1</u>	
1-T-9	102-204-205-206-401-600-700-900
1-T-11	102-204-205-206-401-600-700-900
1-T-12	102-204-205-206-401-600-700-900
<u>SET HS-2</u>	
1-T-25	102-204-2/205-2/206-401-600-700-900
1-T-26	102-204-2/205-2/206-401-600-700-900
<u>SET HS-3</u>	
1-146	102-200A-400A-406-600-700
<u>SET HS-4</u>	
1-T-13	104-200-400A-406-504-600-700
1-T-14	104-200-400A-406-504-600-700
<u>SET HS-5</u>	
1-126A	104-200A-400A-406-600-700
1-144A	104-200A-400A-406-600-700
<u>SET HS-6</u>	
1-T-1	102-200-401-504-600-700
1-T-2	102-200-401-504-600-700
1-T-10	102-200-401-504-600-700
1-T-15	102-200-401-504-600-700
1-T-16	102-200-401-504-600-700
1-T-17	102-200-401-504-600-700
1-T-18	102-200-401-504-600-700
1-T-21	102-200-401-504-600-700
1-T-22	102-200-401-504-600-700
<u>SET HS-7</u>	
1-142A	103-405-503-504



<u>SET HS-8</u>	
1-143D	103-401-503-504
1-143E	103-401-503-504
1-143F	103-401-503-504
1-149F	103-401-503-504
1-149G	103-401-503-504
<u>SET HS-9</u>	
1-148	104-200-405-504-600-700
<u>SET HS-10</u>	
1-143G	104-401-504
1-149C	104-401-504
<u>SET HS-11</u>	
1-143A	104-401-505
1-143B	104-401-505
1-149A	104-401-505
1-149B	104-401-505
<u>SET HS-12</u>	
5-143	104-402
<u>SET HS-13</u>	
1-J-1	104-402-504-600
1-J-3	104-402-504-600
1-J-4	104-402-504-600
<u>SET HS-14</u>	
3-149	104-402-505
<u>SET HS-15</u>	
1-J-2	104-402-505-600
1-J-5	104-402-505-600
<u>SET HS-16</u>	
1-119	104-405
1-120	104-405
1-121	104-405
1-122	104-405
1-123	104-405
1-124	104-405



1-T-19	104-405
1-T-20	104-405
1-T-20A	104-405
<u>SET HS-17</u>	
2-148	104-405-505
1-149D	104-405-505
<u>SET HS-18</u>	
1-143 (2)	2/101-2/201-2/301-2/400-2/504-2/600-700A-701
<u>SET HS-19</u>	
2-143 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
4-143 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
4-149 (2)	2/101-2/202-2/301-2/400-2/600-700A-701
<u>SET HS-20</u>	
3-143 (2)	2/101-2/202-2/301-2/400-2/600-700A-701-802
1-149 (2)	2/101-2/202-2/301-2/400-2/600-700A-701-802
<u>SET HS-21</u>	
2-149 (2)	2/101-202-201-2/301-2/400-504-2/600-700A-701
<u>SET HS-22</u>	
2-149E (2)	2/104-401-502
<u>SET HS-23</u>	
1-143C (2)	2/104-405-502
1-149E (2)	2/104-405-502
<u>POUGHKEEPSIE MIDDLE SCHOOL (PMS)</u>	
<u>SET MS-1</u>	
1-B59	102-204-205-206-401-600-700-900
1-B61	102-204-205-206-401-600-700-900
1-127	102-204-205-206-401-600-700-900
1-128	102-204-205-206-401-600-700-900
1-165	102-204-205-206-401-600-700-900
1-166	102-204-205-206-401-600-700-900
1-214	102-204-205-206-401-600-700-900
1-215	102-204-205-206-401-600-700-900
1-246	102-204-205-206-401-600-700-900
1-247	102-204-205-206-401-600-700-900



1-315	102-204-205-206-401-600-700-900
1-316	102-204-205-206-401-600-700-900
1-343	102-204-205-206-401-600-700-900
1-344	102-204-205-206-401-600-700-900
<u>SET MS-2</u>	
1-108A	102-200-400A-406-504-600-700
1-108B	102-200-400A-406-504-600-700
<u>SET MS-3</u>	
1-B68	104-200A-400A-406-600-700
1-B69	104-200A-400A-406-600-700
1-140	104-200A-400A-406-600-700
1-221	104-200A-400A-406-600-700
1-222	104-200A-400A-406-600-700
1-322	104-200A-400A-406-600-700
1-323	104-200A-400A-406-600-700
<u>SET MS-4</u>	
1-135	102-200-401-504-600-700
1-136	102-200-401-504-600-700
<u>SET MS-5</u>	
1-B65	102-202-401-600-700
1-B66	102-202-401-600-700
<u>SET MS-6</u>	
1-141	103-405-503
<u>SET MS-7</u>	
2-B61	104-402-504-600
2-128	104-402-504-600
2-165	104-402-504-600
2-215	104-402-504-600
1-248	104-402-504-600
1-317	104-402-504-600
1-342	104-402-504-600
<u>SET MS-8</u>	
1-B6	105-405
1-B10	105-405
1-142	104-405



<u>SET MS-9</u>	
1-B70 (2)	2/101-2/202-300A-300B-307-2/400-2/702-704-705-706-801
<u>SET MS-10</u>	
1-B36	103A-200A-405-600-700
	<u>WARRING ELEMENTARY SCHOOL (WES)</u>
<u>SET WE-1</u>	
3-112B (2)	001-001A-2/203-304-306-307-308-309-3/400-2/601-2/702-703-704-800-1000
<u>SET WE-2</u>	
1-009 (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
1-027A (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
1-027B (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
1-112 (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
4-112 (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
3-112A (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
2-112B (2)	2/001-2/203-305-306-307-4/400-2/601-2/702-703-704-800
<u>SET WE-3</u>	
2-112A (2)	2/001-2/203-2/306-307-3/400-2/601-2/702-703-704-800
<u>SET WE-4</u>	
1-017	101-203-300A-400-702-705-801
<u>SET WE-5</u>	
1-022	102-200A-400A-406-600-700-900
1-028	102-200A-400A-406-600-700-900
<u>SET WE-6</u>	
1-123	102A-204-205-206-401-600-700-900
1-124	102A-204-205-206-401-600-700-900
1-221	102A-204-205-206-401-600-700-900
1-222	102A-204-205-206-401-600-700-900
<u>SET WE-7</u>	
1-125	102-200A-402-600-700
1-223	102-200A-402-600-700
<u>SET WE-8</u>	
1-019	103-405-503-504



1-103	103-405-503-504
<u>SET WE-9</u>	
1-109	103-405-503-505
1-208	103-405-503-505

END OF SECTION 08 7100



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**SECTION 08 8000  
GLAZING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Glass for doors, interior borrowed lites, and windows.
  - 2. Glazing sealants and accessories.

**1.02 DEFINITIONS**

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. ASTM C 1036 also includes traditional thickness designations in IP units, but the actual thickness is based on the equivalent IP designation in millimeters.
- C. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- D. BCNYS: Building Code of New York State.
- E. Interspace: Space between lites of an insulating-glass unit.

**1.03 COORDINATION**

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Group 1: Interior Adhesives and Sealants
  - 1. Adhesive Sealant and Primers must comply SCAQMD Rule #1168
  - 2. Aerosol Adhesives must comply with GS-36
  - 3. Adhesives and Sealants shall contain no carcinogen or reproductive toxicant more than 1% of total mass as defined in OEHA
- C. Glass Samples: For each type of the following products; 12 inches square.
  - 1. Laminated glass.
  - 2. Insulating glass.
  - 3. Spandrel Glass.
  - 4. Tempered Glass.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations as indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer and manufacturers of insulating-glass units with sputter-coated, low-E coatings.
  - B. Product Certificates: For glass.
  - C. Product Test Reports: For insulating glass and glazing sealants, for tests performed by a qualified testing agency.
    - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
  - D. Sample Warranties: For special warranties.
-



## **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

## **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

## **1.08 FIELD CONDITIONS**

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
- B. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

## **1.09 WARRANTY**

- A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: Ten years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - 1. PPG Industries, Inc.
    - 2. Guardian Industries.
    - 3. Pilkington.
  - B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
  - C. Obtain reflective-coated glass from single source from single manufacturer.
-



- D. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

## **2.02 PERFORMANCE REQUIREMENTS**

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
1. Design Wind Pressures: per all applicable codes..
  2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
  3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
  2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
  4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
  5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.
- F. All interior glazing sizes and types must comply with NFPA 80 and/or ASTM E119.

## **2.03 GLASS PRODUCTS, GENERAL**

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
  2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
1. Minimum Glass Thickness for Exterior Lites: 6 mm.
  2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.



- E. Strength: Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

#### **2.04 GLASS PRODUCTS**

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.
- C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Reflective-Coated Vision Glass: ASTM C 1376.
- E. Ceramic-Coated Spandrel Glass: ASTM C 1048, Condition B, Type I, Quality-Q3, and complying with other requirements specified.

#### **2.05 INSULATING GLASS**

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
  2. Spacer: Manufacturer's standard spacer material and construction.
  3. Desiccant: Molecular sieve or silica gel, or a blend of both.
  4. See Section 08 5113 for window glazing.

#### **2.06 LAMINATED GLASS**

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
  2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
  3. Interlayer Color: Clear unless otherwise indicated.

#### **2.07 GLAZING SEALANTS**

- A. General:
1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. Field-applied sealants shall have a VOC content of not more than 250 g/L.
  4. Colors of Exposed Glazing Sealants: Match Architect's samples.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Dow Corning Corporation.

#### **2.08 GLAZING TAPES**

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:



1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

## **2.09 MISCELLANEOUS GLAZING MATERIALS**

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## **2.10 FABRICATION OF GLAZING UNITS**

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
  1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep systems.
  3. Minimum required face and edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### **3.03 GLAZING, GENERAL**

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.



- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

#### **3.04 TAPE GLAZING**

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

#### **3.05 GASKET GLAZING (DRY)**

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.



- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### **3.06 SEALANT GLAZING (WET)**

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### **3.07 CLEANING AND PROTECTION**

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

### **3.08 MONOLITHIC GLASS SCHEDULE**

- A. Glass Type G-1: Clear fully tempered float glass.
  - 1. Minimum Thickness: 6 mm.
  - 2. Safety glazing required.

### **3.09 INSULATING GLASS SCHEDULE**

- A. Glass Type IG-1 Low-E-coated, insulating glass.
  - 1. Basis-of-Design Product: Product: Cardinal Glass Industries LoE-270.
  - 2. Overall Unit Thickness: 1 inch
  - 3. Minimum Thickness of Each Glass Lite: 6 mm.
  - 4. Outdoor Lite: Clear fully tempered float glass.
  - 5. Tint Color: Clear.
  - 6. Interspace Content: Argon.
  - 7. Indoor Lite: Clear fully tempered float glass.



- 8. Low-E Coating: Sputtered on second surface.
- 9. Glass Unit Performance Characteristics:
  - a. Visible Light Transmittance: 68 percent
  - b. Visible Light Reflectance Outdoors: 31 percent
  - c. Direct Solar Energy Transmittance: 13 percent
  - d. Direct Solar Energy Reflectance Outdoors: 27 percent
  - e. Center of Glass U-Value: 0.25 maximum.
  - f. Solar Heat Gain Coefficient: 0.36
- B. Safety glazing required.
- C. Where obscure glazing indicated, provide Pattern 62 obscure tempered 6mm inner lite.
- D. Louvers: Industrial Louvers, Inc., Model 1516, narrow profile with glazing flanges, in sizes to match existing. Color to match the new window frame color.

**END OF SECTION**



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**SECTION 08 8110  
FIRE-RATED GLASS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Fire-rated glazing materials installed as vision lights in fire-rated doors.

**1.02 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM E2074-00: Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
  - 2. ASTM E2010-01: Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
  - 3. ASTM E119-07: Standard Test Methods for Fire Tests of Building Construction and Materials.
- B. American National Standards Institute (ANSI):
  - 1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings
- C. Consumer Product Safety Commission (CPSC):
  - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials
- D. Glass Association of North America (GANA):
  - 1. GANA – Glazing Manual.
  - 2. FGMA – Sealant Manual.
- E. National Fire Protection Association (NFPA):
  - 1. NFPA 80: Fire Doors and Windows.
  - 2. NFPA 252 – Fire Tests of Door Assemblies.
  - 3. NFPA 257 – Fire Tests of Window Assemblies.
- F. Underwriters Laboratories, Inc. (UL):
  - 1. UL 9 – Fire Tests of Window Assemblies.
  - 2. UL 10B – Fire Tests of Door Assemblies.
  - 3. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Fire-rated glass ceramic clear and wireless glazing material with surface-applied film listed for use in impact safety-rated locations such as doors, transoms and borrowed lites with fire rating requirements ranging from 20 minutes to 3 hours with required hose stream test.

**1.04 SUBMITTALS**

- A. Product data: Submit manufacturer's technical data for each glazing material required, including installation and maintenance instructions.
- B. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.
- C. Product Test Listings: From UL indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.
- D. Samples: Submit, for verification purposes, two 8-inch by 10-inch samples for each type of glass indicated.



### **1.05 QUALITY ASSURANCE**

- A. Glazing Standards: FGMA Glazing Manual and Sealant Manual.
- B. Fire Protective Rated Glass: Each lite shall bear permanent, nonremovable label of UL certifying it for use in tested and rated fire protective assemblies.
- C. Fire Protective Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or other certification agency acceptable to authorities having jurisdiction.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle materials per manufacturer's written instructions.
- B. Deliver materials to specified destination in manufacturer's or distributor's packaging, undamaged, complete with installation instructions.
- C. Store off ground, under cover, protected from weather and construction activities.

### **1.07 WARRANTY**

- A. Provide manufacturer's warranty.
- B. Warranty Period: Three years from date of Substantial Completion.

## **PART 1 PRODUCTS**

### **2.01 FIRE-RATED GLAZING MATERIALS**

- A. Product: FireLite® NT as supplied by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065, voice 1-800-426-0279, fax 1-800-451-9857, e-mail sales@fireglass.com, web site www.fireglass.com , or equivalent.
- B. Properties:
  - 1. Thickness: 3/16 inch FireLite®.
  - 2. Film: Fire-rated surface film as approved by manufacturer.
  - 3. Weight: 2.4 lbs./sq. ft.
  - 4. Approximate Visible Transmission: 88 percent.
  - 5. Approximate Visible Reflection: 9 percent.
  - 6. Hardness (Vicker's Scale): 700.
  - 7. Fire-rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications.
  - 8. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Category II).
  - 9. Positive Pressure Test: UL 10C, UBC 7-2 and 7-4; passes.
  - 10. Surface Finish:
    - a. Premium Grade-Ground and polished on both sides.
- C. Maximum sheet sizes based on surface finish:
  - 1. Premium: 48 inches by 96 inches.
- D. Labeling: Permanently label each piece of FireLite® NT with the FireLite® logo, UL logo and fire rating.
- E. Fire Rating: Fire rating listed and labeled by UL for fire rating scheduled at opening locations on drawings, when tested in accordance with ASTM E2074-00 and ASTM E2010-01; NPFA 252 and NFPA 257; UL 9, UL 10B and UL 10C.

### **2.02 GLAZING COMPOUND FOR FIRE-RATED GLAZING MATERIALS**

- A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.
  - B. Glazing Compound: DAP 33 putty.
-



- C. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
  - 1. Dow Corning 795 - Dow Corning Corp.
  - 2. Silglaze-II 2800 - General Electric Co.
  - 3. Spectrem 2 - Tremco Inc.
- D. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- E. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

## **2.03 FABRICATION**

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine glass framing, with glazier present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
  - 2. Minimum required face or edge clearances.
  - 3. Observable edge damage or face imperfections.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- C. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

### **3.02 INSTALLATION (GLAZING)**

- A. Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.
  - B. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
  - C. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.
  - D. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
  - E. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.
  - F. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
  - G. Place glazing tape on free perimeter of glazing in same manner described above.
  - H. Install removable stop and secure without displacement of tape.
  - I. Use specified glazing compound, without adulteration; bed glazing material in glazing compound; entirely fill all recess and spaces. Provide visible glazing compound with smooth and straight edges.
  - J. Install in vision panels in fire-rated doors to requirements of NFPA 80.
  - K. Install so that appropriate UL and FireLite® NT markings remain permanently visible.
-



### **3.03 PROTECTION AND CLEANING**

- A. Protect glass from contact with contaminating substances resulting from construction operations. Remove any such substances by method approved by glass manufacturer.
- B. Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of substantial completion. Wash glass by method recommended by glass manufacturer.

**END OF SECTION**



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**SECTION 09 2216  
NON-STRUCTURAL METAL FRAMING****PART 1 GENERAL****1.01 RELATED DOCUMENTS****1.02 DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 01 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.****1.03 SUMMARY****1.04 SECTION INCLUDES:**

- A. Non-load-bearing steel framing systems for interior gypsum board assemblies.

**1.05 RELATED REQUIREMENTS:**

- A. Section 09 29 00 "Gypsum Board."

**1.06 ACTION SUBMITTALS****1.07 PRODUCT DATA: FOR EACH TYPE OF PRODUCT.****1.08 REFERENCES****1.09 SSMA: STEEL STUD MANUFACTURERS ASSOCIATION****1.10 INFORMATIONAL SUBMITTALS****1.11 EVALUATION REPORTS: FOR STEEL STUDS AND RUNNERS, FROM ICC-ES.****PART 1 PRODUCTS****2.01 FRAMING SYSTEMS****2.02 FRAMING MEMBERS, GENERAL: COMPLY WITH ASTM C 754 FOR CONDITIONS INDICATED.**

- A. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
- B. Protective Coating: hot-dip galvanized unless otherwise indicated.

**2.03 STUDS AND RUNNERS: ASTM C 645. USE STEEL STUDS AND RUNNERS.**

- A. Steel Studs and Runners:
  - 1. Minimum Base-Metal Thickness: 25 gauge or a 25 gauge equivalent high performance stud certified under SSMA code compliance program.
  - 2. Depth: As indicated on Drawings.

**2.04 SLIP-TYPE HEAD JOINTS: WHERE INDICATED, PROVIDE ONE OF THE FOLLOWING:**

- A. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
- B. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
- C. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
    - b. Superior Metal Trim; Superior Flex Track System (SFT).



- c. Marino ware: Deep Leg Deflection Track.

## **2.05 AUXILIARY MATERIALS**

### **2.06 GENERAL: PROVIDE AUXILIARY MATERIALS THAT COMPLY WITH REFERENCED INSTALLATION STANDARDS.**

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

### **2.07 ISOLATION STRIP AT EXTERIOR WALLS: PROVIDE ONE OF THE FOLLOWING:**

- A. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.  
B. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

### **3.02 EXAMINE AREAS AND SUBSTRATES, WITH INSTALLER PRESENT FOR COMPLIANCE WITH REQUIREMENTS AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK.**

### **3.03 PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.**

### **3.04 INSTALLATION, GENERAL**

### **3.05 INSTALLATION STANDARD: ASTM C 754.**

- A. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

### **3.06 INSTALL BRACING AT TERMINATIONS IN ASSEMBLIES.**

### **3.07 DO NOT BRIDGE BUILDING CONTROL AND EXPANSION JOINTS WITH NON-LOAD-BEARING STEEL FRAMING MEMBERS. FRAME BOTH SIDES OF JOINTS INDEPENDENTLY.**

### **3.08 INSTALLING FRAMED ASSEMBLIES**

### **3.09 INSTALL FRAMING SYSTEM COMPONENTS ACCORDING TO SPACINGS INDICATED, BUT NOT GREATER THAN SPACINGS REQUIRED BY REFERENCED INSTALLATION STANDARDS FOR ASSEMBLY TYPES.**

- A. Single-Layer Application: 16 inches o.c. unless otherwise indicated.

### **3.10 ATTACH STEEL STUD TRACKS TO GYPSUM DECK.**

### **3.11 WHERE STUDS ARE INSTALLED DIRECTLY AGAINST EXTERIOR MASONRY WALLS OR DISSIMILAR METALS AT EXTERIOR WALLS, INSTALL ISOLATION STRIP BETWEEN STUDS AND EXTERIOR WALL.**

### **3.12 INSTALL STUDS SO FLANGES WITHIN FRAMING SYSTEM POINT IN SAME DIRECTION.**

### **3.13 INSTALL TRACKS (RUNNERS) AT FLOORS AND OVERHEAD SUPPORTS. EXTEND FRAMING FULL HEIGHT TO STRUCTURAL SUPPORTS OR SUBSTRATES ABOVE SUSPENDED CEILINGS. CONTINUE FRAMING AROUND DUCTS PENETRATING PARTITIONS ABOVE CEILING.**

- A. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

### **3.14 INSTALLATION TOLERANCE: INSTALL EACH FRAMING MEMBER SO FASTENING SURFACES VARY NOT MORE THAN 1/8 INCH FROM THE PLANE FORMED BY FACES OF ADJACENT FRAMING.**

**END OF SECTION**



**SECTION 09 2613  
GYPSUM VENEER PLASTERING**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Gypsum veneer plaster over interior masonry surfaces.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings:
  - 1. Show locations, fabrication, and installation of control joints, reveals, and trim; include plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For the following products:
  - 1. Textured Finishes: Manufacturer's standard size for each textured finish and on rigid backing.

**1.04 QUALITY ASSURANCE**

- A. Mockups: Provide a full-thickness finish mockup for each type and finish of gypsum veneer plaster and substrate to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Architect will select representative surfaces and conditions for application of each type of gypsum veneer plaster and substrate.
  - 2. Provide mockups of in sizes of at least 100 sq. ft. (9 sq. m).
  - 3. Apply gypsum veneer plaster, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated.
  - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover, and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- C. Stack panels flat on leveled supports off floor or slab to prevent sagging.

**1.06 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C843 requirements or gypsum veneer plaster manufacturer's written recommendations, whichever are more stringent.
- B. Room Temperatures: Maintain not less than 55 deg F (13 deg C) or more than 80 deg F (27 deg C) for seven days before application of gypsum veneer plaster, continuously during application, and after application until veneer plaster is dry.
- C. Avoid conditions that result in gypsum veneer plaster drying too rapidly.
  - 1. Distribute heat evenly; prevent concentrated or uneven heat on veneer plaster.
  - 2. Maintain relative humidity levels, for prevailing ambient temperature, that produce normal drying conditions.
  - 3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during veneer plaster application until it is dry.



- D. Do not install panels that are wet, moisture damaged, mold damaged, or faded from overexposure to sunlight.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 1 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain gypsum veneer plaster products, including gypsum base for veneer plaster, joint reinforcing tape, and embedding material, from single manufacturer.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

### **2.03 GYPSUM VENEER PLASTER**

- A. Two-Component Gypsum Veneer Plaster: ASTM C587, with separate formulations; one for base-coat application and one for finish-coat application over substrates.
  - 1. Base Coat.
  - 2. Smooth Finish Coat.

### **2.04 TRIM ACCESSORIES**

- A. Standard Trim: ASTM C1047, provided or approved by manufacturer for use in gypsum veneer plaster applications indicated.
  - 1. Material: Galvanized-steel sheet, aluminum-coated steel sheet, or rolled zinc.
  - 2. Shapes:
    - a. Cornerbead.
    - b. Bullnose bead.
    - c. LC-Bead: J-shaped; exposed long flange receives veneer plaster.
    - d. L-Bead: L-shaped; exposed long flange receives veneer plaster.
    - e. U-Bead: J-shaped; exposed short flange does not receive veneer plaster.
    - f. Curved-Edge Cornerbead: With notched or flexible flanges.
    - g. Control joints.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
  - 1. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221 (ASTM B221M), Alloy 6063-T5.
  - 2. Finish: Corrosion-resistant primer compatible with veneer plaster.

### **2.05 AUXILIARY MATERIALS**

- A. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.
  - B. Bonding Agent: ASTM C631 polyvinyl acetate.
  - C. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant, complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E90.
-



- D. Patching Mortar: Dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Masonry Substrates: Verify that mortar joints are struck flush.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Masonry Substrates: Prepare according to gypsum veneer plaster manufacturer's written recommendations and as follows:
  - 1. Clean surfaces to remove dirt, grease, oil, and other foreign matter and deposits that could impair bond with gypsum veneer plaster.
  - 2. Apply bonding agent on dry masonry substrates.

### **3.03 INSTALLING TRIM ACCESSORIES**

- A. General: Install trim with back flanges intended for fasteners, and attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install according to ASTM C844 and in specific locations approved by Architect.
- C. Trim: Install in the following locations:
  - 1. Bullnose Bead: Use at outside corners.
- D. Aluminum Trim:
  - 1. Apply and embed joint tape over flanges of aluminum trim accessories if recommended by trim manufacturer.

### **3.04 GYPSUM VENEER PLASTERING**

- A. Bonding Agent: Apply bonding agent on dry masonry according to gypsum veneer plaster manufacturer's written recommendations.
  - B. Gypsum Veneer Plaster Mixing: Mechanically mix gypsum veneer plaster materials to comply with ASTM C843 and with gypsum veneer plaster manufacturer's written recommendations.
  - C. Gypsum Veneer Plaster Application: Comply with ASTM C843 and with veneer plaster manufacturer's written recommendations.
    - 1. Two-Component Gypsum Veneer Plaster:
      - a. Base Coat: Hand trowel or machine apply base coat over substrate to a uniform thickness of 1/16 to 3/32 inch (1.6 to 2.4 mm). Fill voids and imperfections.
      - b. Finish Coat: Trowel apply finish-coat plaster over base-coat plaster to a uniform thickness of 1/16 to 3/32 inch (1.6 to 2.4 mm).
    - 2. Where gypsum veneer plaster abuts metal, including doorframes, windows and other units, groove finish coat to eliminate spalling.
  - D. Concealed Surfaces: Do not omit gypsum veneer plaster behind cabinets, furniture, furnishings, and similar removable items. Omit veneer plaster in the following areas where it will be concealed from view in the completed Work unless otherwise indicated or required to maintain fire-resistance and STC ratings:
    - 1. Above suspended ceilings.
    - 2. Behind wood paneling.
  - E. Gypsum Veneer Plaster Finish: Match existing.
-



### **3.05 PROTECTION**

- A. Protect installed gypsum veneer plaster from damage from weather, condensation, construction, and other causes during remainder of the construction period.
- B. Remove and replace gypsum veneer plaster and gypsum base panels that are wet, moisture damaged, or mold damaged.
  - 1. Indications that gypsum base panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that gypsum base panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION**



**SECTION 09 2900  
GYPSUM BOARD**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Interior gypsum board.
  - 2. Identifying and labeling of partitions.

**1.02 RELATED REQUIREMENTS:**

- A. Section 07 9200 Joint Sealants.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

**1.05 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**PART 2 PRODUCTS**

**2.01 GYPSUM BOARD, GENERAL**

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

**2.02 INTERIOR GYPSUM BOARD**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Georgia-Pacific Gypsum LLC.
  - 2. National Gypsum Company.
  - 3. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396.
  - 1. Thickness: 5/8 inch.
  - 2. Long Edges: Tapered.

**2.03 TRIM ACCESSORIES**

- A. Interior Trim: ASTM C 1047.
  - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
  - 2. Shapes:
    - a. Cornerbead.



- b. Bullnose bead.
- c. LC-Bead: J-shaped; exposed long flange receives joint compound.
- d. L-Bead: L-shaped; exposed long flange receives joint compound.
- e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
- f. Expansion (control) joint.
- g. Curved-Edge Cornerbead: With notched or flexible flanges.

## **2.04 JOINT TREATMENT MATERIALS**

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  - 1. Interior Gypsum Board: Paper.
  - 2. Exterior Gypsum Soffit Board: Paper.
  - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
  - 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
  - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.

## **2.05 AUXILIARY MATERIALS**

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

## **2.06 STEEL DRILL SCREWS: ASTM C 1002, UNLESS OTHERWISE INDICATED.**

- A. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- B. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Pecora Corporation; AC-20 FTR.
    - b. USG Corporation; SHEETROCK Acoustical Sealant.
  - 2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and substrates with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 APPLYING AND FINISHING PANELS, GENERAL**

- A. Comply with ASTM C 840.
-



- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports, where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- D. Form control and expansion joints with space between edges of adjoining gypsum panels.
- E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

### **3.03 APPLYING INTERIOR GYPSUM BOARD**

- A. Install interior gypsum board in the following locations:
  - 1. Type X: As indicated on Drawings.

### **3.04 SINGLE-LAYER APPLICATION:**

- A. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
  - 1. Stagger abutting end joints not less than one framing member in alternate courses of panels.
- B. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### **3.05 INSTALLING TRIM ACCESSORIES**

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners.
  - 2. Bullnose Bead: Use where indicated.
  - 3. LC-Bead: Use at exposed panel edges.
  - 4. L-Bead: Use where indicated.
  - 5. U-Bead: Use at exposed panel edges.
  - 6. Curved-Edge Cornerbead: Use at curved openings.

### **3.06 FINISHING GYPSUM BOARD**

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
  - B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
-



- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

### **3.07 PROTECTION**

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION**



**SECTION 09 3000  
TILING**

**PART 1 GENERAL**

**1.01 SUMMARY**

**1.02 SECTION INCLUDES:**

- A. Ceramic tile.
- B. Stone thresholds.
- C. Waterproof membrane.
- D. Crack isolation membrane.
- E. Tile backing panels.
- F. Metal trim and transition strips.

**1.03 RELATED SECTIONS:**

- A. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
- B. Section 092900 "Gypsum Board" for cementitious backer units and glass-mat, water-resistant backer board.

**1.04 DEFINITIONS**

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

**1.05 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
  - 1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.
  - 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than 4 tiles. Use grout of type and in color or colors approved for completed Work.
  - 3. Full-size units of each type of trim and accessory for each color and finish required.
  - 4. Stone thresholds in 6-inch lengths.
  - 5. Metal edge strips in 6-inch lengths.

**1.06 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified Installer.
-



- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product, signed by product manufacturer.
- D. Material Test Reports: For each tile-setting and -grouting product and special purpose tile.

#### **1.07 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
  - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

#### **1.08 QUALITY ASSURANCE**

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
  - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
  - 1. Stone thresholds.
  - 2. Waterproof membrane.
  - 3. Crack isolation membrane.
  - 4. Joint sealants.
  - 5. Cementitious backer units.
  - 6. Metal edge strips.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockup of each type of floor tile installation.
  - 2. Build mockup of each type of wall tile installation.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- E. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

#### **1.09 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
  - B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
  - C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
  - D. Store liquid materials in unopened containers and protected from freezing.
  - E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.
-



## 1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

## PART 2 PRODUCTS

### 2.01 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
  - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.
- D. Low-Emitting Materials: Tile flooring systems shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- F. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
  - 1. Where tile is indicated for installation on exteriors or in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- G. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

### 2.02 TILE PRODUCTS

- A. Products: Basis of Design: Manufacturer: Daltile.
  - 1. Floor Tiles (CFT-1, CFT-2):
    - a. Model/size: Keystone
    - b. Size: 2" x 2".
    - c. Color(s):
      - 1) CFT-1 (Field): Suede Gray D208
      - 2) CFT-2 (Accent): Galaxy D023 or Nautical Blue D621.
    - d. Finish: Matte.
  - 2. Wall Tiles (CWT-1):
    - a. Model/size: Color Wheel Collection - Linear
    - b. Size: 4" x 8", with 4" x 4" cove base.
    - c. Color: Suede Gray 0182.
    - d. Finish: Glossy.
  - 3. Wall Tiles (CWT-2):
    - a. Model/size: Color Wheel Collection - Classic.
    - b. Size: 4" x 4".
    - c. Color: Cobalt DM14.
    - d. Finish: Glossy.



### 2.03 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
  - 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.
- B. Marble Thresholds: ASTM C 503, with a minimum abrasion resistance of 10 per ASTM C 1353 or ASTM C 241 and with honed finish.
  - 1. Description: Uniform, fine- to medium-grained white stone with gray veining.

### 2.04 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, in maximum lengths available to minimize end-to-end butt joints.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. USG Corporation; DUROCK Cement Board.
  - 2. Thickness: As indicated.

### 2.05 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Hydroment; Ultra-set.

### 2.06 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bostik, Inc.; Ultra-set Advanced.

### 2.07 SETTING MATERIALS

- A. Latex Modified Mortar (Thin Set): ANSI A118.4.
    - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - a. Laticrete International, Inc.
    - 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
    - 3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.
  - B. Organic Adhesive: ANSI A136.1, Type I, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - a. Laticrete International, Inc.
-



## 2.08 GROUT MATERIALS

- A. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Laticrete International, Inc.
  - 2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, and certified by manufacturer for intended use.

## 2.09 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Section 079200 "Joint Sealants."
  - B. Retain first subparagraph below if required for LEED-NC, or LEED-CI, or LEED-CS Credit IEQ 4.1.
    - 1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    - 2. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
    - 3. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
  - C. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
  - D. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
    - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      - a. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
      - b. Dow Corning Corporation; Dow Corning 786.
      - c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
      - d. Tremco Incorporated; Tremsil 600 White.
  - E. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.
    - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      - a. Pecora Corporation
      - b. Sika Corporation; Sikaflex-2c SL.
      - c. Tremco Incorporated.
  - F. Chemical-Resistant Sealants: For chemical-resistant floors, provide chemical-resistant elastomeric sealant of type recommended and produced by chemical-resistant mortar and grout manufacturer for type of application indicated, with proven service record and compatibility with tile and other setting materials, and with chemical resistance equivalent to mortar/grout.
    - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - a. Atlas Minerals & Chemicals, Inc.
-



## **2.10 SPECIAL TRIM AND ACCESSORIES**

- A. Products: Basis of Design: Schluter Systems.
  - 1. Outside Corners: Transition TR-3: "Rondec".
  - 2. All in "AGTB" finish.

## **2.11 MISCELLANEOUS MATERIALS**

- A. Trowelable Underlayment's and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- C. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bonsal American; an Oldcastle company; Grout Sealer.
    - b. Bostik, Inc.; CeramaSeal.
    - c. MAPEI Corporation; KER 004, Keraseal Penetrating Sealer for Unglazed Grout and Tile.
    - d. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
    - e. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
    - f. TEC; a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.

## **2.12 MIXING MORTARS AND GROUT**

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
    - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
    - 2. Verify that concrete substrates for tile floors installed with adhesives, bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
      - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
      - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
    - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
    - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
-



- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

### **3.03 TILE INSTALLATION**

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
  - B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
  - C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
  - D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
  - E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
    - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
    - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
    - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
  - F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
    - 1. Porcelain and Ceramic Floor and Wall Tile 1/8 inch maximum.
  - G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
  - H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
    - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
    - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
  - I. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
-



1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin set).
  2. Do not extend waterproofing or crack isolation membrane under thresholds set in latex-portland cement mortar. Fill joints between such thresholds and adjoining tile set on waterproofing or crack isolation membrane with elastomeric sealant.
- J. Metal Trim Strips: Install at locations indicated.
- K. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

### **3.04 TILE BACKING PANEL INSTALLATION**

- A. Install cementitious backer units and fiber-cement underlayment and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

### **3.05 WATERPROOFING INSTALLATION**

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

### **3.06 CRACK ISOLATION MEMBRANE INSTALLATION**

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

### **3.07 CLEANING AND PROTECTING**

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
  2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
  3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

### **3.08 INTERIOR TILE INSTALLATION SCHEDULE**

- A. Interior Floor Installations, Concrete Subfloor:
1. Tile Installation F113: Thin-set mortar; TCA F113.
    - a. Tile Type: Porcelain.
    - b. Thin-Set Mortar: Latex-Modified cement mortar.
    - c. Grout: Water-cleanable epoxy grout.
  2. Tile Installation F122: Thin-set mortar on waterproof membrane; TCA F122.
    - a. Tile Type: Porcelain



- b. Setting Mortar: Latex or Medium-bed, latex- portland cement mortar.
  - c. Grout: Water-cleanable epoxy grout.
- B. Interior Wall Installations, Metal Studs or Furring:
  - 1. Tile Installation W244: Thin-set mortar on cementitious backer units; TCA W244.
    - a. Tile Type: Porcelain.
    - b. Setting Mortar: Latex or Medium-bed, latex- portland cement mortar.
    - c. Grout: Water-cleanable epoxy grout.

**END OF SECTION**



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**SECTION 09 5113  
ACOUSTICAL PANEL CEILINGS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes acoustical panels and exposed suspension systems for ceilings.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product, including proposed hanger wire anchors.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Evaluation Reports: For each acoustical panel ceiling suspension system, from ICC-ES.

**1.04 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For finishes to include in maintenance manuals.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
  - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

**1.06 QUALITY ASSURANCE**

- A. Test reports: Manufacturer will provide test certification for minimum requirements as tested in accordance with applicable industry standards and/or to meet performance standards specified by various agencies.
- B. Changes from system: System performance following any substitution of materials or change in assembly design must be certified by the manufacturer.
- C. All ceiling panel cartons must contain UL label for acoustical compliance.
- D. All suspension system cartons must contain UL label for load compliance per ASTM C635.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

**1.08 FIELD CONDITIONS**

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

**PART 2 PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to Seismic Category C.
-



1. Provide manufacturer's approved and tested seismic assembly complying with:
  - a. American Society of Civil Engineers 7-05: Minimum Design Loads for Buildings and Other Structures.
  - b. CISC: Guidelines for Seismic Restraint Direct Hung Suspended Ceiling Assemblies Seismic Zones 3 & 4.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials. Finish units not less than 5/8" thick, with flame spread of 25 or less complying with ASTM E-84. Classrooms, and meeting rooms shall be provided with an acoustical ceiling tile with a minimum Noise Reduction Coefficient (NRC) rating of 0.65.
  2. Smoke-Developed Index: 25 or less.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## 2.02 ACOUSTICAL PANELS, GENERAL

- A. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.
- C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
  1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.
- E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
  1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

## 2.03 ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide "Fine Fissured" by Armstrong World Industries or comparable product by one of the following:
  1. USG Corp.
  2. CertainTeed Corp.
- B. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
  1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
  2. Pattern: E (lightly textured).
- C. Fire Classification: Class A.
- D. Color: White.
- E. NRC: Not less than 0.70.
- F. CAC: Not less than 35.



- G. Edge/Joint Detail: Square.
- H. Thickness: 5/8 inch.
- I. Modular Size: 24 by 24 inches.

#### **2.04 METAL SUSPENSION SYSTEMS, GENERAL**

- A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
  - 1. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
  - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.
- D. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.
- F. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
- G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.
- H. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.

#### **2.05 METAL SUSPENSION SYSTEM**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Armstrong World Industries, Inc.
  - 2. CertainTeed Corp.
  - 3. Chicago Metallic Corporation.
  - 4. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.
  - 1. Structural Classification: Heavy-duty system.
  - 2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
  - 3. Face Design: Flat, flush.
  - 4. Cap Material: Steel or aluminum cold-rolled sheet.
  - 5. Cap Finish: Match panel color.
  - 6. Basis of Design: Armstrong Prelude XL 15/16" Exposed Tee.

#### **2.06 METAL EDGE MOLDINGS AND TRIM**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - 1. Armstrong World Industries, Inc.
-



2. CertainTeed Corp.
  3. Chicago Metallic Corporation.
  4. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.
1. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
  2. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

## **2.07 ACOUSTICAL SEALANT**

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
1. Acoustical Sealant for Exposed and Concealed Joints:
    - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
    - b. USG Corporation; SHEETROCK Acoustical Sealant.
  - B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
    1. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.
    2. Acoustical sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

### **3.03 INSTALLATION**

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.



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3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  8. Do not attach hangers to steel deck tabs.
  9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post installed anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
  3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Ceiling Perimeter (Seismic Considerations): Install edge moldings (7/8" minimum) and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Tee ends shall be tied together with manufacturer supplied Stabilizer Bars or other approved means to prevent the tees from spreading apart.
  2. Maintain a 3/8" clearance between the ends of the suspension members and the wall. The unattached ends of the suspension members shall rest upon and be free to slide perpendicularly to the perimeter molding.
  3. Alternate Perimeter Attachment: When approved by local code officials install 7/8" edge molding with grid manufacturers Seismic Clip accessory in lieu of stabilizer bars.
- F. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- G. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
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1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
3. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
5. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

#### **3.04 CLEANING**

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION**



**SECTION 09 6050**  
**URETHANE CEMENT COMPOSITION FLOORING**

**PART 1.00 - GENERAL****1.01 GENERAL REQUIREMENTS**

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

**1.02 WORK INCLUDED**

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the urethane cement composition flooring and integral base, including moisture vapor transmission suppression system, as scheduled on the drawings and/or specified herein.

**1.03 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product Data: Submit manufacturer's technical data, application instructions and general recommendations for the urethane cement composition flooring specified herein.

**1.04 SAMPLES FOR INITIAL SELECTION PURPOSES IN FORM OF SAMPLE OF ALL AVAILABLE COLORS, AND TEXTURES:**

- A. Submit 2-1/2" x 4" samples: color to be selected by Architect from manufacturer's full range of available colors.
- B. Samples for Verification: For each resinous flooring system or color selected, provide 2 each, 6 inches (150mm) square samples in the selected color and texture, applied to a ridged backing by the installing contractor.
- C. Material certificates signed by manufacturer certifying that the urethane cement composition flooring supplied for the project complies with requirements specified herein.
- D. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.
- E. Contractor Certification: Submit a letter from the primary materials manufacturer certifying that the installing contractor has been properly trained in the application of the materials being installed, is acceptable to the materials manufacturer, with a record of successful in-service performance.
1. Engage an installer who employs only persons trained and approved by the resinous flooring manufacturer for applying resinous flooring systems specified.
  2. Engage an installer who is certified in writing by the resinous flooring manufacturer as a factory trained applicator qualified to apply the specified resinous flooring system.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer or applicator that has specialized in installing resinous flooring types similar to that required for this Project and who is acceptable to manufacturer of primary materials.
- B. Single-Source Responsibility: Obtain urethane cement composition flooring materials, including primers, resins, hardening agents, and finish or sealing coats, from a single manufacturer. Provide secondary materials, including patching and fill materials, joint sealant, accessory items, and repair materials. Of a type and from a source recommended by the manufacturer of the primary materials
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- C. Qualified Materials: Request for material approvals for any products other than the specified products must be submitted to the architect two weeks prior to the bid, including complete application specification, physical characteristics, and chemical resistance data. Any request after this date will not be accepted. Failure of performance requires immediate removal and replacement of unapproved substituted material with those originally specified at no cost to the owner, architect, construction manager, or general contractor.
- D. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set the standard of quality for materials and installation.
  - 1. Apply all components of the specified resinous flooring system at the specified thickness and finished in the texture and color as selected. Apply a minimum 100 square feet area to simulate the actual installation characteristics. Include areas that demonstrate the finished cove base, joint detailing, terminations or any other special conditions.
  - 2. Simulate finished lighting conditions for Architects review of mockups.
  - 3. Approved mockups may become part of the completed work if undisturbed at the time of substantial completion.
    - a. DELIVERY, STORAGE AND HANDLING
- E. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.
- F. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

## 1.06 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with urethane cement composition flooring manufacturer's directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation, and other conditions required to execute and protect Work.
- B. Lighting: Permanent lighting will be in place and working before installing resinous flooring.
- C. Moisture Vapor Transmission: Perform Calcium Chloride test in conformance to ASTM F1869 or In Situ relative humidity test conforming to ASTM F2170 to determine moisture vapor emission levels prior to application of any component of the flooring system. Do not install flooring over substrate with MVT emission levels in excess of 14 lbs. per 24 hour period over a 1000 square foot area or with a relative humidity in excess of 88%. Provide Moisture Vapor Transmission Suppression System specified in this Section.

## PART 2.00 - PRODUCTS

### 2.01 MATERIALS

- A. Flooring: Basis of Design: Troweled urethane cement composition flooring shall be Dex-O-Tex Tek-Crete SL-B, top-coated with pigmented polyaspartic sealer Dex-O-Tex Quik-Glaze, with Tek-Crete VRT cove base, as manufactured by Crossfield Products Corp. in Rancho Dominguez, California and Roselle Park, New Jersey.
- B. Moisture Vapor Transmission Suppression System:
  - 1. Provide fluid-applied uniquely modified epoxy moisture vapor transmission suppression system meeting ASTM F3010 specification.
    - a. System shall withstand moisture vapor emission rates (MVER) of 24 lbs/1000 sf/24 hours, and in-situ relative humidity (RH) up to 99%, and reduce emissions to a Permeance of < 0.1 grains/h/sf/in.
- C. System shall be applied in a single application ranging from 17-22 mils.
- D. Provide a 10 year Full Replacement Warranty.
- E. System shall be compatible with finish flooring.
- F. Physical Properties:



1. Adhesion (ASTM D7234): >480 psi (100% failure in concrete exposed to Moisture Vapor Emission Rate (MVER) at 10 lbs/1000 sf/24 hr/per ASTM F1869).
2. Compressive Strength (ASTM D695): 12,000 psi.
3. Tensile Strength (ASTM D638): 5,600 psi.
4. Tensile Elongation (ASTM D638): 2.7%.
5. Permeability (perms) Rating (ASTM E96): <0.085.
6. Microbial Resistance (ASTM G21): Passes Rating 1.
7. Alkali Resistance (ASTM D1308): Resistant.

G. Basis of Design: Dex-O-Tex VaporControl Primer 1P (verify compatibility with finish flooring).

## 2.02 PROPERTIES (FLOORING)

- A. Colors: As indicated, or if not otherwise indicated, as selected by Architect from manufacturer's full range of standard colors.
- B. Physical Properties:
- C. Provide flooring system that meet or exceed the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.
- D. .... 8,100 psi
- E. Thermal Distortion (350°F Emersion).....Passes
- F. Tensile Strength (ASTM C307)..... 1,000 psi
- G. Flexural Strength (ASTM C580)..... 2,000 psi
- H. Thermal Co-Efficient of Thermal Expansion (ASTM C531)..... 1.5x10<sup>5</sup> in/in/degree F
- I. .... 130 lbs/ft<sup>3</sup>
- J. ....0.64%
- K. ....85- 90 Durometer "D"
- L. ....0.0 gr.
  1. Adhesion (ASTM D4541).....>400 psi (100% failure in concrete)
  2. Greater than 1.07 watts/cm<sup>2</sup>
- M. ....Passes Rating 1

## PART 3.00 - EXECUTION

### 3.01 INSPECTION

- A. Examine the areas and conditions where the urethane cement composition flooring is to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Architect.
- B. Moisture Test: Perform moisture test in conformance with ASTM F 1869 and ASTM F 2170.

### 3.02 PREPARATION

- A. Substrate: Perform preparation and cleaning procedures according to moisture vapor transmission suppression system and flooring manufacturer's written instructions for particular substrate conditions involved, and as specified. Provide clean, dry, and neutral substrate for flooring application.
- B. Concrete Surfaces: Shot-blast, or power scarify as required to obtain optimum bond of flooring to concrete. Remove sufficient material to provide a sound surface free of laitance, glaze, efflorescence, and any bond-inhibiting curing compounds or form release agents. Remove grease, oil, and other penetrating contaminate. Prepare substrate in accordance with SSPC SP 13. Repair damaged and deteriorated concrete to acceptable condition. Leave surface free of dust, dirt, laitance, and efflorescence.



1. Provide Moisture Vapor Transmission Suppression System per manufacturer's written instructions.
- C. Materials: Mix resin hardener and aggregate as required, and prepare materials according to flooring system manufacturer's instructions.

### **3.03 APPLICATION**

- A. General: Apply each component of urethane cement composition flooring system according to manufacturer's written directions to produce a uniform monolithic flooring surface of thickness indicated.
- B. Body Coat: Over prepared surface, screed mortar mix at nominal 3/16" – 1/4"-inch thickness as specified. Allow material flow out and begin to settle. Back roll with a spike roller or looped roller as appropriate to distribute material to a smooth even finish.
- C. Broadcast Aggregate: Broadcast selected size and type of slip resistant aggregate into the wet Body Coat. Apply to even distribution and texture, allow to cure.
- D. Remove Excess Aggregate: Remove all loose or unsound aggregate from the cured surface. Vacuum up all dust and fine particles from the surface, remove any ridge lines and detail all imperfection in the textured surface.
- E. Apply the seal coat in the selected color as recommended to produce a surface matching the submittal sample and project mock-up samples.
- F. Cove Base: Apply cove base mix to wall surfaces at locations shown to form cove base height of 4 inches unless otherwise indicated. Follow manufacturer's printed instructions and details including taping, mixing, troweling, and sanding, of cove base.

### **3.04 CURING, PROTECTION AND CLEANING**

- A. Cure urethane cement composition flooring materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process. Close application area for a minimum of 24 hours.

**END OF SECTION**



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**SECTION 09 6513**  
**RESILIENT BASE AND ACCESSORIES****PART 1 GENERAL****1.01 SUMMARY**

- A. Section Includes:
  - 1. Resilient base.
  - 2. Resilient molding accessories.

**1.02 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.

**1.03 QUALITY ASSURANCE**

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

**1.05 PROJECT CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

**1.06 EXTRA MATERIALS**

- A. Furnish extra materials described below that match the products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Resilient Base and Moldings: provide 5% extra stock of the total installed quantity for each color, style, and size installed.

**PART 2 PRODUCTS****2.01 THERMOPLASTIC-RUBBER BASE**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. Burke Mercer Flooring Products; a division of Burke Industries Inc.
  - 3. Johnsonite; A Tarkett Company.
  - 4. Nora Systems, Inc.
  - 5. Roppe Corporation, USA.
- B. Products: Subject to compliance with requirements, provide the basis of design product indicated by Architect or the following equivalent products matching the basis of design products, characteristics and color:



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- 1. Approved equal
  - C. Colors: As selected by Architect from full range of industry colors
  - D. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).
    - 1. Group: I solid, homogeneous
    - 2. Style and Location:
      - a. Style B, Cove: Provide in areas with resilient flooring
      - 1) Profile: As indicated
  - E. Thickness: 0.125 inch
  - F. Height: 4".
  - G. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
  - H. Outside Corners: Job formed or preformed.
  - I. Inside Corners: Job formed or preformed.

## **2.02 RESILIENT MOLDING ACCESSORY (TS)**

- A. Resilient Molding Accessory:
  - 1. Basis-of-Design Product: Subject to compliance with requirements, available products that may be incorporated into the Work include, but not limited to the products indicated by Architect.
- B. Description:
  - 1. Reducer strip for resilient floor covering
  - 2. Joiner for tile
  - 3. Carpet Transition strips.
- C. Material: Vinyl
- D. Colors and Patterns: To be determined by owner.

## **2.03 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
  - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
    - a. Cove Base Adhesives: Not more than 50 g/L.
    - b. Rubber Floor Adhesives: Not more than 60 g/L.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
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- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
  - C. Do not install resilient products until they are same temperature as the space where they are to be installed.
    - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
  - D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

### **3.03 RESILIENT BASE INSTALLATION**

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
  - 1. Inside Corners: Use straight pieces of maximum lengths possible.

### **3.04 RESILIENT ACCESSORY INSTALLATION**

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet that would otherwise be exposed.

### **3.05 CLEANING AND PROTECTION**

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

**END OF SECTION**



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**SECTION 09 6519  
RESILIENT TILE FLOORING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Vinyl composition floor tile.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
  - 1. Show details of special patterns.
- C. Samples: Full-size units of each color and pattern of floor tile required.
  - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.
- D. Samples for Initial Selection: For each type of floor tile indicated.
- E. Samples for Verification: Full-size units of each color and pattern of floor tile required.
  - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.

**1.04 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
  - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

**1.08 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 90 deg F, in spaces to receive floor tile during the following time periods:
    - 1. 48 hours before installation.
    - 2. During installation.
    - 3. 48 hours after installation.
  - B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 90 deg F.
  - C. Close spaces to traffic during floor tile installation.
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- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. FloorScore Compliance: Resilient tile flooring shall comply with requirements of FloorScore certification.
- C. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

### **2.02 VINYL COMPOSITION FLOOR TILE**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Armstrong World Industries, Inc.
- B. Products: Standard Excelon Multicolor
- C. Color: As selected by Architect from manufacturer's full range of standard colors.
- D. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
- E. Wearing Surface: Smooth.
- F. Thickness: 0.125 inch
- G. Size: 12 by 12 inches.

### **2.03 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
  - 1. Products:
    - a. Ardex Feather Finish
    - b. Mapei Planipatch
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
  - 1. Adhesives shall comply with the following limits for VOC content:
    - a. Vinyl Composition Tile Adhesives: 50 g/L or less.
  - 2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
    - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
  - B. Proceed with installation only after unsatisfactory conditions have been corrected.
-



### 3.02 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Apply moisture vapor barrier (Basis of Design: Laticrete DRYTEK Moisture Vapor Barrier) over new concrete slabs. Install per manufacturer's written instructions.
  - 2. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
    - a. Coordinate removal of existing flooring systems with the selective demolition and asbestos abatement specifications.
  - 3. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
    - a. If Solvent methods are used to remove asbestos mastics comply with the procedures outlined in the asbestos abatement specifications regarding solvent removal of mastics.
  - 4. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  - 5. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
    - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Floor Preparation Sequence
  - 1. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
  - 2. Flash Patch and Skim Coat the entire floor surface. Lightly sand ridges and bumps using a commercial grade floor sander to produce uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

### 3.03 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
  - B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
    - 1. Lay tiles in pattern of colors and sizes indicated.
  - D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
  - E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
-



- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

### **3.04 CLEANING AND PROTECTION**

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
  - 1. Apply three coat(s).
- E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.
- F. Sealers and Finish Coats: Remove soil, visible adhesive, and surface blemishes from resilient terrazzo floor tile surfaces before applying liquid cleaners, sealers, and finish products.
  - 1. Sealer: Apply two base coats of liquid sealer.
  - 2. Finish: Apply three coats of liquid floor finish.
- G. Cover floor tile until Substantial Completion.

### **END OF SECTION**



**SECTION 09 7200  
WALL COVERINGS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Work consists of furnishing all labor, materials and equipment required, and of furnishing and applying plaster wall liner.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.
- B. Shop Drawings: Show location and extent of each wall-covering type. Indicate seams and termination points.
- C. Samples: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 36 inches (914 mm) long in size.
- D. Product Schedule: For wall coverings.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

**1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For wall coverings to include in maintenance manuals.

**1.07 QUALITY ASSURANCE**

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for installation.
  - 1. Build mockups for each type of wall covering on each substrate required. Comply with requirements in ASTM F1141 for appearance shading characteristics.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

**1.08 APPLICABLE STANDARDS**

- A. American Society for Testing & Materials (ASTM) – ASTM E84 – Surface Burning Characteristics of Building Materials.
  - B. National Fire Protection Association (NFPA) – NFPA Life Safety Code.
  - C. Uniform Building Code (UBC) – UBC Standard 42-2 – Standard Test Method for Evaluating Room Fire Growth Contribution of Textile Wallcovering.
  - D. Approvals:
    - 1. New York State Uniform Fire prevention and Building Code –DOS File 9950-880725-1001.
    - 2. National Bureau of Standards for the encapsulation of lead-based paint in Publication #NBSIR 75-761.
-



- E. Physical / Chemical Properties:
  - 1. Set Time – Approximately 20 minutes.
  - 2. Tensile Strength – 375 PSI.
  - 3. Compressive Strength – 11,000 PSI.
  - 4. Fire Rating – Class A -15 Flame Spread.
  - 5. Smoke Generated – 0.
  - 6. Surface Hardness - 160°.
  - 7. Average Setting Expansion – 0.160%.
  - 8. Maximum Setting Expansion – 0.200%.
  - 9. Weight Per Linear Yard – Approximately 42 Ounces
  - 10. Thickness – Approximately 0.050 Inches (50 mil).

## **1.09 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.
- B. Lighting: Do not install wall covering until lighting that matches conditions intended for occupants after Project completion is provided on the surfaces to receive wall covering.
- C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.
- D. Inspect wall surface to which the Flexi-Wall Liner will be bonded. Using a wall scraper, knock off any mortar or other projections from the face of the wall. Remove all electrical switch and outlet covers.
- E. Wall surface to which the Flexi-Wall liner will be applied should be a minimum of 50°F for 12 hours before and after application of wall liner.

## **PART 1 PRODUCTS**

### **2.01 PLASTER WALL LINER**

- A. Materials: Basis-of-Design: Wall liner shall be Faster Plaster manufactured by Flexi-Wall Systems, PO Box 89, 208 Carolina Drive, Liberty, SC 29657 (800-843-5394). The liner materials shall consist of a fabric impregnated with uncrystallized gypsum (hydrocal cement). The plaster shall be formulated so that when it is applied to a substrate with Flexi-Wall #500 Adhesive, it will crystallize and form a secure bond with the wall surface. The material shall have a Fire Hazard Classification of A, Fuel Contributed 0, and Smoke Developed 0 all according to ASTM-E-84.
- B. Description: Flexi-Wall #609 Faster Plaster Wall Liner is comprised of an all natural and renewable scrim fabric totally encapsulated (2 coats back side and 2 coats face side) with Flexi-Wall patented uncrystallized gypsum cement (hydrocal cement) which has not seen any water until the Flexi-Wall #500 Adhesive is applied to the panel to be bonded to the wall. The water based adhesive bonds the panel to the wall during which time the water in the adhesive actually hardens the uncrystallized gypsum in place on the wall forming a hard plaster veneer. Flexi-Wall #609 Faster Plaster is typically used to cover concrete block, ceramic tile, wood, plaster, metal or any other flat, rigid surface. Flexi-Wall hides cracks, joints, pores, patches and other surface irregularities with little or no advance preparation.
- C. Flexi-Wall #500 Adhesive is water based and non-toxic. It is formulated to not only bond the uncrystallized gypsum panel to the wall but also to cause the plaster to crystallize in place on the wall forming a hard plaster veneer that is smooth, desirable, durable and long lasting.

### **2.02 ACCESSORIES**

- A. Adhesive: Mildew-resistant, nonstaining, adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.



- B. Seam Tape: As recommended in writing by wall-covering manufacturer.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation surfaces being true in plane and vertical and horizontal alignment, maximum moisture content, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, and mildew.
- C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
- D. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.
- E. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

### **3.03 INSTALLATION OF WALL LINER**

- A. Install wall liner, without gaps or overlaps. Form smooth wrinkle-free surface for finished installation. Do not begin wall-covering installation until wall liner has dried.
- B. Remove all burrs or other protrusions from the wall to which the liner shall be applied. Install wall liner in strict accordance with manufacturer's recommended installation instructions. Workmanship shall be inspected as the work proceeds. Wait 12 to 24 hours or until the liner is dry and set to the wall before skim coating.
- C. Apply skim coat over wall liner using drywall compound per wall liner's written instructions, ready for painting. Seams shall be taped and mudded.

### **3.04 CLEANING**

- A. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.
- B. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

**END OF SECTION**



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**SECTION 09 9113  
EXTERIOR PAINTING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on exterior substrates.

**1.02 DEFINITIONS**

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523, a matte flat finish.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, a high-side sheen flat, velvet-like finish.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, an eggshell finish.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523, a satin-like finish.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523, a semi-gloss finish.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523, a gloss finish.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
  - 1. Submit Samples on rigid backing, 8 inches square.
  - 2. Step coats on Samples to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
  - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
  - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
  - 3. VOC content.

**1.04 CLOSEOUT SUBMITTALS**

- A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

**1.06 QUALITY ASSURANCE**

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
    - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
-



- a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
  - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
  - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacture's label with the following information:
  1. Product name and type (description).
  2. Batch date.
  3. Color number.
  4. VOC content.
  5. Environmental handling requirements.
  6. Surface preparation requirements.
  7. Application instructions.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

#### **1.08 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
- D. Lead Paint: Lead paint may be present in buildings and structures to be painted.
  1. Use Lead Safe Work Practices in accordance with US Dept. Of Housing and Urban Development. All employees working with Lead based paint Materials shall have HUD approved training.
  2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified.
  3. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated or comparable product from one of the following:
  1. Benjamin Moore & Co.
  2. Devoe



3. Glidden Professional, Division of PPG Architectural Finishes, Inc.
4. A.B. Paints.
5. PPG Architectural Finishes, Inc.

## **2.02 PAINT, GENERAL**

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
  1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- D. Colors: Match existing.

## **2.03 SOURCE QUALITY CONTROL**

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
  1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  2. Testing agency will perform tests for compliance with product requirements.
  3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
  1. Report, in writing, conditions that may affect application, appearance, or performance of paint.
- B. Substrate Conditions:
  1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
    - a. Concrete: 12 percent.
    - b. Masonry (Clay and CMU): 12 percent.
    - c. Wood: 15 percent.
    - d. Portland Cement Plaster: 12 percent.
  2. Portland Cement Plaster Substrates: Verify that plaster is fully cured.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.
  - a. Application of coating indicates acceptance of surfaces and conditions.

### **3.02 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.



- 
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
    - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
  - C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
    - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
  - D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
  - E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
  - F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
    - 1. SSPC-SP 2, "Hand Tool Cleaning."
    - 2. SSPC-SP 3, "Power Tool Cleaning."
    - 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
    - 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
  - G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
  - H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
  - I. Aluminum Substrates: Remove loose surface oxidation.
  - J. Wood Substrates:
    - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
    - 2. Sand surfaces that will be exposed to view, and dust off.
    - 3. Prime edges, ends, faces, undersides, and backsides of wood.
    - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
  - K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

### 3.03 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
    - 1. Use applicators and techniques suited for paint and substrate indicated.
    - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
    - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
    - 4. Paint entire exposed surface of window frames and sashes.
    - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
    - 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
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- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
  - 1. Paint the following work where exposed to view:
    - a. Equipment, including panelboards.
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
    - g. Tanks that do not have factory-applied final finishes.

#### **3.04 FIELD QUALITY CONTROL**

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
  - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
  - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

#### **3.05 CLEANING AND PROTECTION**

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

#### **3.06 EXTERIOR PAINTING SCHEDULE**

- A. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.
  - 1. Latex System:
    - a. Prime Coat: Primer, latex for exterior wood.
    - b. Intermediate Coat: Latex, exterior, matching topcoat.
    - c. Topcoat: Latex, exterior, semi-gloss: S-W Solo Acrylic Semi-Gloss, A76 Series, at 4.0 mils wet, 1.5 mils dry, per coat.

**END OF SECTION**



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**SECTION 09 9123  
INTERIOR PAINTING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on interior substrates.

**1.02 DEFINITIONS**

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523, a matte flat finish.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, a high-side sheen flat, velvet-like finish.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, an eggshell finish.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523, a satin-like finish.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523, a semi-gloss finish.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523, a gloss finish.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.

**1.04 CLOSEOUT SUBMITTALS**

- A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.
- B. See Division 01 sections (including, but not limited to, 01 7700, 01 7823, 01 7839, 01 8200) for additional requirements.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Provide in unopened cans no larger than 1 gallon in size.
1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

**1.06 QUALITY ASSURANCE**

- A. Contractor Qualifications: Contractor and contractor's staff shall have a minimum 5 years' satisfactory experience in jobs similar in size and nature of the work of this contract. Upon request provide list of projects with references for work performed in the last 5 years.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:
1. Product name and type (description).
  2. Batch date.
  3. Color number.
  4. VOC content.
  5. Environmental handling requirements.
  6. Surface preparation requirements.
  7. Application instructions.



- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

#### **1.08 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Lead Paint: Lead paint may be present in buildings and structures to be painted. Refer to Division 2 for report.. Examine report to become aware of locations where lead paint is present.
  - 1. Use Lead Safe Work Practices in accordance with US Dept.of Housing and Urban Development. All employees working with Lead based paint Materials shall have HUD approved training.
  - 2. Do not disturb lead paint or items suspected of containing hazardous materials except under procedures specified.
  - 3. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.
- D. Color Selections: Color selections for the work at the Courthouse and Annex shall match existing.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated or comparable product from one of the following:
  - 1. Benjamin Moore & Co.
  - 2. Devoe
  - 3. Glidden Professional, Division of PPG Architectural Finishes, Inc.
  - 4. Pratt & Lambert.
- B. Colors: As selected by Architect from manufacturer's full range.

#### **2.02 PAINT, GENERAL**

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
  - B. Material Compatibility:
    - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
    - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
  - C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
    - 1. Flat Paints and Coatings: 50 g/L.
    - 2. Nonflat Paints and Coatings: 150 g/L.
    - 3. Dry-Fog Coatings: 400 g/L.
    - 4. Primers, Sealers, and Undercoaters: 200 g/L.
    - 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
    - 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
    - 7. Pretreatment Wash Primers: 420 g/L.
    - 8. Floor Coatings: 100 g/L.
    - 9. Shellacs, Clear: 730 g/L.
-



10. Shellacs, Pigmented: 550 g/L.

- D. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## **2.03 PATCHING MATERIALS**

- A. Wood Patching Compound: 2-part polyester or epoxy-resin wood compound with a 10- to 15-minute cure at 70 deg F, in knife grade formulation and recommended by manufacturer for type of wood repair indicated. Compound shall be produced for filling damaged wood materials that have deteriorated due to weathering and exposure. Filler shall be capable of filling deep holes and capable of spreading to featheredge.
- B. Metal Patching Compound: 2-part polyester-resin metal patching compound with a 10- to 15-minute cure at 70 deg F, in knife grade formulation and recommended by manufacturer for type of metal repair indicated. Compound shall be produced for filling metal that has deteriorated due to corrosion. Filler shall be capable of filling deep holes and capable of spreading to featheredge.
- C. Interior Plaster Patching Compound: Provide spackle and plaster patching compounds and repair materials specifically manufactured for surface preparation and sanding prior to repainting.
1. Existing Keene's Cement: Refer to Division 09 Section "Gypsum Plastering."

## **2.04 CLEANING MATERIALS**

- A. Detergent Cleaning Solution: Mix 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for each 5 gal. of solution required.
- B. Job-Mixed Mold, Mildew, and Algae Remover: Mix 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of hot water for every 5 gal. of solution required.
- C. Paint Deglosser: "Paint Deglosser" Item No. 42124 by Zinsser Company, Inc., or comparable product by an approved manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
1. Report, in writing, conditions that may affect application, appearance, or performance of paint.
- B. Substrate Conditions:
1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
- a. Concrete: 12 percent.
  - b. Masonry (Clay and CMU): 12 percent.
  - c. Wood: 15 percent.
  - d. Gypsum Board: 12 percent.
  - e. Plaster: 12 percent.
2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
3. Plaster Substrates: Verify that plaster is fully cured.
4. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.



- C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.
  - a. Application of coating indicates acceptance of surfaces and conditions.

### 3.02 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Glossy surfaces of old paint films shall be cleaned and dulled prior to re-painting
- E. Fill any open joints of metal walls and metal ceilings with a paintable caulk. Remove existing prior to application.
- F. Fill all joints between metal walls and wood casings with a paintable caulk. Remove existing prior to application.
- G. Plaster surfaces: Fill and patch any cracks in plaster surfaces. Sand surfaces to minimize the surface profile of cracked and peeling areas. Eliminate defects causing abrupt surface profile differences exceeding 1/32"
- H. Cracks, holes, bulges or gouges in wall and ceiling surfaces shall be spackled and sanded smooth. Loose, peeling, blistering, chalking and scaling paint shall be removed to the refusal point by scraping. Resulting edges of all areas so scraped shall be spackled to a feathered edge and sanded smooth when dry.
- I. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
  - 1. Concrete Floors: Remove oil, dust, grease, dirt, and other foreign materials. Comply with SSPC-SP-13/NACE 6 or ICRI 03732.
- J. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- K. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any.
  - 1. Remove all rust with wire brushes. If areas of rust still remain, use a chemical rust remover to remove the last traces, or as much of the rust as is possible.
- L. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- M. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- N. Aluminum Substrates: Remove loose surface oxidation.
- O. Wood Substrates:
  - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
  - 2. Sand surfaces that will be exposed to view, and dust off.
  - 3. Prime edges, ends, faces, undersides, and backsides of wood.



4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
5. Wood surfaces scheduled to be finished with an opaque finish shall be sanded as required to produce a smooth substrate for application of the new coatings. Correct new and existing abrupt surface profile differences exceeding 1/32"
- P. Wood Floors: wood surfaces scheduled to be refinished with a transparent finish shall have existing coating stripped and sanded prior to application of new coatings
- Q. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

### 3.03 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
  1. Use applicators and techniques suited for paint and substrate indicated.
  2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
  1. Paint the following work where exposed in equipment rooms:
    - a. Equipment, including panelboards.
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
    - g. Tanks that do not have factory-applied final finishes.
    - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
  2. Paint the following work where exposed in occupied spaces:
    - a. Equipment, including panelboards.
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
    - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.



- h. Other items as directed by Architect.
- 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

### 3.04 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- E. Do not paint over name plates or instruction labels. Keep sprinkler heads free of paint

### 3.05 INTERIOR PAINTING SCHEDULE

- A. CMU Substrates:
  - 1. Latex System:
    - a. Block Filler: Block filler, latex, interior/exterior, MPI #4 X-Green: S-W PrepRite Block Filler, B25W25, at 100 to 200 sq. ft. per gal.
    - b. Intermediate Coat: Latex, interior, matching topcoat.
    - c. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52 X-Green/#145 X-Green: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils wet, 1.7 mils dry, per coat.
    - d. Topcoat: Latex, interior, semi-gloss, (Gloss Level 4), MPI #43 X-Green: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat.
- B. Metal Substrates (Aluminum, Steel, Galvanized Steel):
  - 1. Latex System:
    - a. Prime Coat: Primer, rust-inhibitive, water based, MPI #107: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10 mils wet, 2.0 to 4.0 mils dry.
    - b. Intermediate Coat: Water-based acrylic, interior, matching topcoat.
    - c. Topcoat: Water-based acrylic, semi-gloss, (Gloss Level 5), MPI #147 X-Green]: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, at 2.5 to 4.0 mils dry, per coat.
    - d. Topcoat: Water-based acrylic, gloss, (Gloss Level 6), MPI #148 X-Green: S-W Pro Industrial Acrylic Gloss Coating, B66-660 Series, at 2.5 to 4.0 mils dry, per coat.
  - 2. Water-Based Dry-Fall System:
    - a. Top Coat: Dry-fall latex: S-W Pro Industrial Waterborne Acrylic Dryfall Flat, S-W Pro Industrial Waterborne Acrylic DryFall Eg-Shel, S-W Pro Industrial Waterborne Acrylic DryFall Semi-Gloss, at 5.8 to 6.0 mils wet, 1.7 to 2.3 mils dry. (The finish is to match adjacent existing finish).
- C. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.
  - 1. Latex System:
    - a. Prime Coat: Primer sealer, latex, interior, MPI #39: S-W PrepRite ProBlock Primer Sealer, B51-620 Series, at 4.0 mils wet, 1.4 mils dry.
    - b. Intermediate Coat: Latex, interior, matching topcoat.
    - c. Topcoat: Latex, interior, semi-gloss, (Gloss Level 4), MPI #43 X-Green: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat.
- D. Wood Substrates, Pedestrian Traffic Surfaces:



1. Wood Floor System:
  - a. First Coat: Miniwax High Build Polyurethane
  - b. Topcoat: Miniwax High Build Polyurethane.
- E. Gypsum Board Substrates:
  1. Latex System:
    - a. Prime Coat: Primer, latex, interior, MPI #149 X-Green: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry.
    - b. Intermediate Coat: Latex, interior, matching topcoat.
    - c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53 X-Green/#143 X-Green: S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat.
    - d. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52 X-Green/#145 X-Green: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils wet, 1.7 mils dry, per coat.

**END OF SECTION**



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**SECTION 10 2113.19  
PLASTIC TOILET COMPARTMENTS****PART 1 GENERAL****1.01 SUMMARY**

- A. Section Includes:
  - 1. Solid-plastic toilet compartments configured as toilet enclosures and urinal screens.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.
- B. Shop Drawings: For toilet compartments.
  - 1. Include plans, elevations, sections, details, and attachment details.
  - 2. Show locations of cutouts for compartment-mounted toilet accessories.
  - 3. Show locations of centerlines of toilet fixtures.
  - 4. Show locations of floor drains.
  - 5. Show ceiling-mounted items, and overhead support or bracing locations.
- C. Samples for Initial Selection: For each type of toilet compartment material indicated.
  - 1. Include Samples of hardware and accessories involving material and color selection.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
  - 1. Each type of material, color, and finish required for toilet compartments, prepared on 6-inch- (152-mm-) square Samples of same thickness and material indicated for Work.
  - 2. Each type of hardware and accessory.
- E. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location and selected colors for toilet compartment material.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For each type of toilet compartment.

**1.04 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and source.
  - 1. Door Hinges: One hinge(s) with associated fasteners.
  - 2. Latch and Keeper: One latch(es) and keeper(s) with associated fasteners.
  - 3. Door Bumper: One bumper(s) with associated fasteners.
  - 4. Door Pull: One door pull(s) with associated fasteners.
  - 5. Fasteners: Ten fasteners of each size and type.

**1.06 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

**PART 2 PRODUCTS****2.01 PERFORMANCE REQUIREMENTS**

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - 1. Flame-Spread Index: 25 or less.
    - 2. Smoke-Developed Index: 450 or less.
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- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

## **2.02 SOLID-PLASTIC TOILET COMPARTMENTS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. General Partitions Mfg. Corp.
  2. Global Partitions; ASI Group.
  3. Scranton Products. (Basis of Design).
- B. Toilet-Enclosure Style: Floor anchored /Overhead braced.
- C. Urinal-Screen Style: Floor anchored.
- D. Door, Panel, Screen, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
  2. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
  3. Color and Pattern: Paisley, orange peel.
- E. Pilaster Shoes: Manufacturer's standard design; stainless steel.
- F. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters; with shoe and sleeve (cap) matching that on the pilaster.
- G. Brackets (Fittings):
1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

## **2.03 HARDWARE AND ACCESSORIES**

- A. Hardware and Accessories: Manufacturer's heavy-duty operating hardware and accessories.
1. Hinges: Manufacturer's minimum 0.062-inch- (1.59-mm-) thick stainless-steel paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees, allowing emergency access by lifting door. Mount with through-bolts.
  2. Latch and Keeper: Manufacturer's heavy-duty surface-mounted cast-stainless-steel latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through-bolts.
  3. Coat Hook: Manufacturer's heavy-duty combination cast-stainless-steel hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories. Mount with through-bolts.
  4. Door Bumper: Manufacturer's heavy-duty rubber-tipped cast-stainless-steel bumper at out-swinging doors. Mount with through-bolts.
  5. Door Pull: Manufacturer's heavy-duty cast-stainless-steel pull at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through-bolts.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.



**2.04 MATERIALS**

- A. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- B. Stainless-Steel Castings: ASTM A 743/A 743M.

**2.05 FABRICATION**

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.
- B. Floor-Anchored Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Ceiling-Hung Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for connection to structural support above finished ceiling. Provide assemblies that support pilasters from structure without transmitting load to finished ceiling. Provide sleeves (caps) at tops of pilasters to conceal anchorage.
- D. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.
- E. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
  - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
    - 1. Maximum Clearances:
      - a. Pilasters and Panels: 1/2 inch (13 mm).
      - b. Panels and Walls: 1 inch (25 mm).
    - 2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
      - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
      - b. Align brackets at pilasters with brackets at walls.
  - B. Floor-Anchored /Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches (44 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
  - C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.
-



**3.03 ADJUSTING**

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

**END OF SECTION**



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**SECTION 10 2800**  
**TOILET, BATH & LAUNDRY ACCESSORIES****TOILET, BATH, AND LAUNDRY ACCESSORIES****PART 1 GENERAL****2.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**2.02 SUMMARY**

- A. Section Includes:
  - 1. Public-use washroom accessories.

**2.03 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include the following:
  - 1. Construction details and dimensions.
  - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
  - 3. Material and finish descriptions.
  - 4. Features that will be included for Project.
  - 5. Manufacturer's warranty.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
- C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.
- D. Warranty: Sample of special warranty.

**2.04 QUALITY ASSURANCE**

- A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

**2.05 COORDINATION**

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

**2.06 WARRANTY**

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 15 years from date of Substantial Completion.

**PART 1 PRODUCTS****3.01 MATERIALS**

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
  - B. Brass: ASTM B 19, flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
  - C. Steel Sheet: ASTM A 1008, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
  - D. Galvanized-Steel Sheet: ASTM A 653, with G60 hot-dip zinc coating.
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- E. Galvanized-Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

### 3.02 PUBLIC-USE WASHROOM ACCESSORIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - 1. A & J Washroom Accessories, Inc.
  - 2. American Specialties, Inc.
  - 3. Bobrick Washroom Equipment, Inc.
  - 4. Bradley Corporation.
  - 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
- B. Toilet Tissue (Roll) Dispenser:
  - 1. Provided by Owner, installed by Contractor (one unit for each toilet stall).
- C. Liquid-Soap Dispenser:
  - 1. Provided by Owner, installed by Contractor (one unit for each lavatory).
- D. Grab Bar:
  - 1. Basis-of-Design Product: Bobrick B-5806 Series
  - 2. Mounting: Flanges with concealed fasteners.
  - 3. Material: Stainless steel, 0.05 inch thick.
    - a. Finish: Smooth, No. 4, satin finish.
  - 4. Outside Diameter: 1-1/4 inches.
  - 5. Configuration and Length: As indicated on Drawings.
- E. Sanitary-Napkin Disposal Unit:
  - 1. Basis-of-Design Product: Bobrick No. B-270.
  - 2. Mounting: Partition mounted.
  - 3. Material and Finish: Stainless steel, No. 4 finish (satin).
  - 4. Provided by Owner, installed by Contractor (one unit for each Womens'/Girls' toilet stall).
- F. Mirror Unit:
  - 1. Basis-of-Design Product: Bobrick No. B-165.
  - 2. Frame: Stainless-steel 1/2" by 1/2" by 1/2" channel, 0.05 inch thick.
    - a. Corners: Mitered welded and ground smooth.
  - 3. Hangers: Integral hanging brackets near top and bottom with locking devices.
  - 4. Size: As indicated on drawings.
  - 5. Location: Provide at each lavatory and where indicated.
- G. Folding Shower Seat:
  - 1. Basis-of-Design Product: Bobrick No. B-5181.
  - 2. Material and Finish: one-piece, 1/2" thick, solid phenolic with matte finish, antique white-colored.
  - 3. Frame: 18-8, Type 304 stainless steel with satin finish. 16 gauge square tubing and 18 gauge diameter seamless tubing.
  - 4. Mounting flanges: two 18-8, Type 304, 3/16" thick stainless steel with satin finish. 3" diameter with three mounting screw holes.
  - 5. Baseplate: 18-8, Type 304, heavy-gauge stainless steel.
  - 6. Spring: 17-7, Type 301, 24 gauge stainless steel, spot-welded to baseplate.
  - 7. Guide bracket: 18-8, Type 304, 16 gauge stainless steel with satin finish.



- 
8. Provide where indicated.
- H. Shower Curtain Rod:
    1. Basis-of-Design Product: Bobrick No. B-207.
    2. Material and Finish: 18-8, Type 304, 20 gauge stainless steel tubing with satin finish. 1" outside diameter.
    3. Concealed mounting brackets: Aluminum.
    4. Provide at each shower and changing room.
  - I. Shower Curtain:
    1. Basis-of-Design Product: Bobrick No. B-204.
    2. Material and Finish: opaque, matte white vinyl 0.008" thick, containing antibacterial and flame-retardant agents. Nickel-plated brass grommets, 6" o.c. Bottom and sides hemmed.
    3. Provide one at each shower compartment and changing station.
  - J. Shower Curtain Hooks:
    1. Basis-of-Design Product: Bobrick No. B-204-1.
    2. Material and Finish: Type 304 stainless steel for use on 1" and 1-1/4" diameter shower curtain rods.
    3. Provide number required for each shower curtain.
  - K. Surface-mounted Single Robe Hook:
    1. Basis-of-Design Product: Bobrick No. B-7671.
    2. Material and Finish: Type 304 stainless steel with bright polished finish.
    3. Provide at each shower compartment and changing station.
  - L. Surface-mounted Door Bumper:
    1. Basis-of-Design Product: Bobrick No. B-687.
    2. Material and Finish: Type 304 stainless steel with bright polished finish. Unit shall be equipped with neoprene bumper.
    3. Provide at each compartment door.
  - M. Electric Hand Dryers (provided by Electrical Contractor):
    1. Basis-of-Design: Excel Dryer, Inc., Xlerator XL-SB-H-1.1N Electric Hand Dryer.
    2. Material and Finish: Stainless steel, brushed finish.
    3. " Noise Reduction Nozzle.
    4. Antimicrobial wall guard: 89S Brushed Stainless Steel.
    5. Touch-free infra-red activation.
    6. HEPA Filtration System.
    7. 208-240 Volt.
    8. Provide at each toilet room and where indicated.
  - N. Utility Shelf with mop/broom holders:
    1. Basis-of-Design Product: Bobrick No. B-239.
    2. Material and Finish: Stainless steel, type 304 18 ga with satin finish.
    3. Mop/broom holders: spring loaded rubber cams with anti-slip coating.
    4. Hooks: 12 ga stainless steel with satin finish attached with two rivets.
    5. Provide at each Janitor Closet.

### 3.03 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
  - B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.
-



**PART 1 EXECUTION****4.01 INSTALLATION**

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

**4.02 ADJUSTING AND CLEANING**

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

**END OF SECTION**



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**SECTION 10 4160**  
**LED ELECTRONIC MESSAGE CENTER****PART 1 - GENERAL****1.01 . DESCRIPTION – ELECTRONIC MESSAGE CENTER (BASIS OF DESIGN: 'TEKSTAR LED SIGNAGE' AS MANUFACTURED BY STEWART SIGNS).****1.02 QUALITY STANDARDS**

- A. Entire unit shall comply with UL 48 and NEC Article 600 for Electric Sign Safety.
  - 1. Signs – UXYT.E50724
  - 2. Signs Certified for Canada – UXYT7.E50724
  - 3. Sign Accessories – Component – UYMR2.E352634
- B. Made in the USA with Foreign & Domestic Components.

**MINIMUM WIND LOAD RATING: 120 MPH, EXPOSURE B.**

**PART 2 – PRODUCT****3.01 MATERIALS**

- A. Steel:
  - 1. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z275) coating, either commercial or forming steel.
  - 2. Hot-Rolled Structural-Steel Shapes: ASTM A 36/A 36M or ASTM A 529/A 529M.
  - 3. Steel Tubing: ASTM A 500, Grade B.
  - 4. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or
    - a. Bolts for Steel Framing: ASTM A 307 or ASTM A 325 (ASTM A 325M) as
    - b. necessary for design loads and connection details.
  - 5. For steel exposed to view on completion, provide materials having flat,
- B. Sign Protection Faces: Clear, matte finish polycarbonate Bayer "Makrolon" SL Sign Grade Sheet with advanced UV resistant technology.
  - 1. Impact Resistance: 18 ft-lbf/in. per ASTM D 256. 2. Tensile Strength: 9000 lbf/sq. in. per ASTM D 638. 3. Flexural Modulus of Elasticity: 345,000 lbf/sq. in. per ASTM D 790.
  - 2. Heat Deflection: 270 deg F at 264 lbf/sq. in. per ASTM D 648. 5. Abrasion Resistance: 1.5 percent maximum haze increase for 100
  - 3. Minimum 24 gage (0.0276 inches). 2. Finish: Powder Coating. Colors to be selected by Architect.
    - a. Cabinet Dimensions: 5'x8'.
      - 1) Forced Air Ventilation (heating and cooling protection).
      - 2) Hinged Sign Face(s) allows access to internal lamps and ballast(s) without (a) removing face(s).
      - 3) Concealed extruded aluminum hinges.
      - 4) Cover supported with integrated gas springs when open. 6. DuPont TGIC Powder Coat Finish (Colors as selected by Architect).
      - 5) Internally Illuminated.
  - 4. Illumination package type:LED.
  - 5. Power Requirements:13.16 Amps @ 120 VAC.

**3.02 SIGN FACE:**

- 1) Matte Finish Clear polycarbonate Bayer Makrolon® SL Sign Grade Sheet.
  - 2) Thermoformed Sign Face.
  - 3) Decorated with second surface (inside), 3M High-Performance Translucent vinyl
    - (a) for all name/logo graphics. Text/logos/graphics etc. to be provided by Owner. Each sign may be different.
-



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**SIGNS TO BE DOUBLE-SIDED.****4.01 INTEGRATED INTERNAL LED DISPLAY CABINETS (PROPRIETARY UL APPROVED DESIGN)**

- A. Internal LED Cabinet mounted inside the External Identification Cabinet, behind the Makrolon SL Sign Faces for protection against UV/graffiti/vandalism damage.
  - 1) LED Display Cabinet constructed using aluminum extrusions.
  - 2) The LED display cabinet is a single-sided LED display.
  - 3) Double Sided Signs to have two internal LED Display Cabinets inside. 5. Cabinets shall be weather resistant & placed inside the External Identification (a) Cabinet.
  - 4) Hinged cover allows access to internal electronic components without requiring (a) the removal of LED boards.
  - 5) Forced Air Ventilation (heating and cooling protection).

**4.02 LED DISPLAY**

- 1) Pixel Pitch:16mm.
  - 2) LED Pixel Matrix:40x140.
  - 3) Electrical Requirements:13.16 Amps @ 120 VAC.
  - 4) Working Temperature: -40°F - 185°F, 10-95% Relative Humidity. 5. Support a Voltage Range of: 88 ~ 264VAC.
  - 5) Overload protection: 105 ~ 135% of rated power.
  - 6) Input Efficiency: 83%.
- B. Over Temperature Protection: Auto shut-down of voltage and recovers automatically when the temperature goes down.
  - 1. Brightness shall be variable, a. up to 8,000 NITs.
  - 2. Down to less than 100 NITs.
  - 3. Screen Blackout as a scheduled option.
    - 1) Three (3) LEDs per Pixel:1 Red, 1 Green, and 1 Blue. 11.The LED display shall display the following:
  - 4. Text.
  - 5. Graphics, video clips and animations.
  - 6. Colors - 281 quintillion.
  - 7. Up to 60 frames per second video clips, animations, and transitions. e. 1,200 Hertz refresh rate.
  - 8. 32 Gigabyte SATAIII Solid State Hard Drive with pre-loaded graphics library.
- C. Brightness controlled either automatically via a light sensor or manually through use of the controlling software.
  - 1. Exhaust fans run 24/7 to regulate environment inside the display cabinet(s). 2.6 DATA COMMUNICATION
    - a. LED display shall be compatible with Cell Data Modem.
    - b. Provide Cell Data Modem.
    - c. Wireless Data Modem with no restrictions on distance.

**4.03 SPECIFIED PRODUCT WARRANTY**

- a. Lifetime warranty against workmanship and defects.
  - 1) Lifetime warranty on the Makrolon SL® sign faces due to breakage by vandalism.
- b. 5 Year warranty on the LED display and internal electronic components. 4. 5 Year warranty on LED illumination LiteRods™.
- c. 5-year warranty on communication devices.



**PART 3 – SOFTWARE SPECIFICATIONS 3.1 WEB BASED INTERFACE****5.01 SIGNCOMMAND.COM IS THE INTERFACE SITE. 2. NOTHING TO DOWNLOAD.**

- a. System Requirements:
    - (a) Modern Web Browser. 2. Internet connection.
      - (1) An always-on internet connection that is accessible to the sign. 3.2 SOFTWARE SPECIFICATION AND CAPABILITIES
  - b. Secured using Amazon Web Service hosting .
  - c. 2-factor authentication .
  - d. Use from anywhere in the world with internet access on any modern browser . 4. Intuitive, simple interface .
  - e. Scheduling can be pre-programmed years in advance .
  - f. Scheduling will be made available in 12 or 24-hour formats .
  - g. User-friendly menu and icon based software .
  - h. Online help will provide excerpts from the Owner's Manual .
  - i. Simultaneous display and edit capability .
  - j. Automatic rebooting of system disk shall be made after a power outage; system
- B. clock and calendar shall continue to function during a power failure. 11. Various text modules and scalable fonts.
- a. Horizontal and Vertical Traveling text.
  - b. Menu guided control of all software feature
  - c. Unlimited access to online graphics library.
  - d. Google Fonts available in all supported languages and regions 16. Supported Video file formats: AVI, MOV, MP4, MPG, and WMV. 17. Supported Image File Formats: BMP, GIF, JPG, PNG, and TIF.
    - (a) Display temperature in Fahrenheit or Celsius
  - e. Ability to add borders to text
  - f. Ability to overlay text on top of graphics or video clips
  - g. Ability to preview the message before transmitting to display
  - h. Ability to control transition effects, message length, motion or lack thereof

**5.02 SOFTWARE TRAINING**

- a. Provide online video training with no fees and unlimited telephone training
- b. Provide on-line, self-guided video tutorial as well.
- c. The manufacturer will provide online links to software, programming/user
  - (a) manuals, and maintenance procedure.



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**6.01 FCC NOTICE**

**6.02 ALL COMPONENTS HAVE BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.**

**6.03 OPERATION OF THIS DEVICE IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION. THE USER IS CAUTIONED THAT ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR FCC COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.**

**6.04 EACH SIGN WILL CONTAIN ONE OF THE FOLLOWING LED MODULES:**

- (a) LED-10M-RGB-32X32P-320X320M, LED-16M-RGB-20X20P-320X320M, LED-20M-1RGB-16X16P- 320X320M, LED-20M-1RGB-8x16P-160X320M, LED-20M-2R-8X16P-160X320M, LEDDM-10M- 1RGB-32X32P-320X320M, LEDDM-10M-1RGB-32X32P-320X320M-2017, LEDDM-16M-2RGB-20X20P-320X320M, LEDDM-16M-2RGB-20X20P-320X320M-2017, LEDDM-20M-2RGB-16X16P- 320X320M, LEDDM-20M-16X16P-320X320M-2017

**6.05 POWER SUPPLY:**

- (a) Meanwell RSP-320-5
  - (1) Send Card: SENDCARD-NS
  - (2) Receive Card: RECCARD-MRV560-NS

**6.06 CONTROL SYSTEM**

- (a) Industrial PC - Lanner HQ-LEC-7020D V1.TS128MSQ64V8U GB DDR2 (FCC certified)

**6.07 WIRELESS RADIOS AND MODEMS (IF ORDERED):**

- (a) Ubiquiti BulletM2HP with POE 24v (FCC Certified)
- (b) Sierra Wireless Airlink LS300 (FCC Certified) Sierra Wireless R5-S1-10 RV-50 (FCC Certified)

**END OF SECTION**



**SECTION 10 5113  
METAL LOCKERS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Welded athletic lockers.
  - 2. Locker benches.
- B. **LOCKERS WILL BE SUPPLIED AND INSTALLED BY THE OWNER (VIA COOPERATIVE PURCHASE AGREEMENT).**

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.
- B. Shop Drawings: For metal lockers and benches.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Show locker trim and accessories.
  - 3. Include locker identification system and numbering sequence.
- C. Samples: For each color specified, in manufacturer's standard size.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.
- E. Samples for Verification: For the following products, in manufacturer's standard size:
  - 1. Lockers and equipment.
  - 2. Locker benches.
- F. Product Schedule: For lockers. Use same designations indicated on Drawings.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Sample Warranty: For special warranty.

**1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

**1.07 QUALITY ASSURANCE**

- A. **MANUFACTURING STANDARD:** Provide metal lockers that are standard products of a single manufacturer, with interchangeable like parts. Include necessary mounting accessories, fittings, and fastenings.
  - B. **FABRICATOR QUALIFICATIONS:** Firm experience (minimum 5 years) in successfully producing the type of metal lockers indicated for this project, with sufficient production capacity to produce required units without causing delay in the work.
  - C. **INSTALLER QUALIFICATIONS:** Engage an experienced (minimum 2 years) installer who has successfully completed installation of the type of metal lockers and extent to that indicated for this project.
-



### **1.08 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. The following metal locker hardware items equal to 10 percent of amount installed for each type and finish installed, but no fewer than five units:
    - a. Blank identification plates.
    - b. Hooks.

### **1.09 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.
- B. DELIVERY: All materials shall be delivered to the site at such a time as required for proper coordination of the work. Materials are to be received in the manufacturer's original, unopened packages and shall bear the manufacturer's label.
- C. STORAGE: Store all materials in a dry and well-ventilated place adequately protected from the elements.

### **1.10 FIELD CONDITIONS**

- A. Field Measurements: Verify actual dimensions by field measurements before fabrication.

### **1.11 COORDINATION**

- A. Coordinate sizes and locations of concrete bases for metal lockers.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

### **1.12 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures.
    - b. Faulty operation of latches and other door hardware.
  - 2. Warranty Period for Welded Metal Lockers: Lifetime of the facility.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain metal lockers, locker benches, and accessories from single source from single locker manufacturer.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Accessibility Standard: For lockers indicated to be accessible, comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

### **2.03 WELDED ATHLETIC LOCKERS**

- A. Manufacturers offering products which may be incorporated in the work include the following:
    - 1. Basis of Design: List Industries Inc., "SUPERIOR MARQUIS CHAMPION ALL-WELDED ATHLETIC LOCKERS", or approved equal.
  - B. All lockers shall be factory-assembled, of all MIG welded construction, in multiple column units to meet job conditions. Assembly of locker bodies by means of bolts, screws, or rivets will not be permitted. Welding of knockdown locker construction is not acceptable. Grind exposed welds and metal edges flush and make safe to touch.
    - 1. Sizes and Tier Types: as indicated on drawings.
-



- 
2. FRAME / VERTICAL SIDE PANELS: Shall be of 13 gauge 1/2" flattened expanded metal framed by 16 gauge Hollow "T" tubular sections and channel frame members designed to enclose all four edges of the side panel with the entire assembly MIG welded to form a rigid frame for each locker. The channel frame members are welded to the front and rear vertical frame members to create and anchor bearing surface of 1-1/4 inches wide x the depth of the locker at each side panel. Note: Diamond perforated sheet steel or 3/4" expanded metal will NOT be accepted.
  3. INTEGRAL FRAME LOCKER BASE: 14 gauge galvaneal formed structural channels are MIG welded to the front and rear vertical side panel frame members to allow placement of locker bottom a minimum 2-3/4" above floor level. Locker bottom shelf located less than 2" above floor level will not be acceptable.
  4. FLAT TOPS: Shall be formed of one piece of 16 gauge solid cold rolled sheet steel and shall be an integral part MIG welded to each vertical side panel frame member and be continuous to cover the full width of a multiple framed locker unit.
  5. HAT SHELVES, INTERMEDIATE SHELVES AND BOTTOMS: Shall be 16 gauge solid galvaneal sheet steel, have double bends at front and shall engage slots in the Hollow "T" vertical frame members at all four corners and be securely welded to the frame and side. Locker bottom shelf located less than 2" above floor level will not be acceptable.
  6. BACKS: Shall be 18 gauge cold rolled sheet steel, be continuous to cover a multiple framed unit and be welded to each vertical side panel frame member.
  7. DOORS: Outer door to be fabricated from single sheet prime 14 gauge with single bends at top and bottom and double bends at the sides with a 3" wide 18 gauge full height channel door stiffener MIG welded to the hinge side of the door as well as to the top and bottom door return bends and spot welded to the inside of door face to form a rigid torque-free box reinforcement for the door. Doors to be perforated with 5/8" x 1-1/2" diamonds.
  8. LATCHING: The latching mechanism shall be single-point rigid non-moving positive latch by means of a heavy gauge (minimum 11 gauge) latch securely welded to the framed vertical divider. The latch assembly must be made of a single piece of steel and have a padlock loop that inserts through the recess pan. Locking device shall be designed for use with either built-in combination locks or padlocks. Latch hooks shall be 11 gauge (minimum) with riveted bumpers and shall be MIG welded to vertical frame member.
  9. HANDLE: All locker doors shall have a seamless drawn 304 stainless steel recessed handle shaped to receive a padlock. The recess pan shall be deep enough to have the lock be completely flush with the outer door face.
  10. DOOR HINGES: Hinges shall not be less than 3-1/2" long 13 gauge seven knuckle pin type, securely riveted to frame and welded to the door. Doors are to be secured to frame with a minimum of two tamper resistant rivets per hinge. Provide 3 hinges for doors 48" and higher and 2 for doors shorter than 48".
- C. Locks: Combination padlocks (by Owner).
- D. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high attached to door with 2 aluminum rivets.
- E. Hooks: Manufacturer's standard ball-pointed, aluminum or steel; zinc plated.
- F. Continuous Sloping Tops: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet, with a pitch of approximately 18 degrees.
1. Closures: Vertical-end type.
- G. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- H. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- I. Boxed End Panels: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.
- J. Materials:
1. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
-



2. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with A60 (ZF180) zinc-iron, alloy (galvannealed) coating designation.
- K. Finish: Powder coat.
  1. FINISHING: All locker parts to be cleaned and coated after fabrication with a seven stage hot-spray washing process and coated with a zirconium-based nanotechnology providing a green alternative to traditional iron phosphate followed by a coat of high grade custom blend powder electrostatically sprayed and baked at 350 degrees Fahrenheit for a minimum of 20 minutes to provide a tough durable finish.
  2. Color: As selected by Architect from manufacturer's full range of standard colors.

## 2.04 LOCKS

- A. Combination Padlock: Provided by Owner.

## 2.05 LOCKER BENCHES

- A. Provide bench units with overall assembly height of 17-1/2 inches (445 mm).
- B. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
  1. Size: 9-1/2 inches wide by 1-1/4 inches thick (241 mm wide by 32 mm thick) except provide 20- to 24-inch- (508- to 610-mm-) wide tops where accessible benches are indicated.
  2. Laminated hardwood finished with one coat of deep-penetrating sealer, and two coats of heavy body, high impact, hot, hydraulically applied lacquer on all surfaces.
- C. Bench Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top, complete with fasteners, and as follows:
  1. Aluminum: 1/8-inch-thick by 3-inch-wide (3-mm-thick by 76-mm-wide) channel or 1/4-inch-thick by 3-inch-wide (6-mm-thick by 76-mm-wide) bar stock, shaped into trapezoidal form; with nonskid pads at bottom. Product: List Industries, Inc., 4820 Aluminum Pedestal.
    - a. Finish: Manufacturer's Color #729 Parchment, anodic finish.
- D. Materials:
  1. Extruded Aluminum: ASTM B221 (ASTM B221M), alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.

## 2.06 FABRICATION

- A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
  1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
  2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.
- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments.
- C. Equipment: Provide each locker with an identification plate and the following equipment:
  1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.
  2. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.
  3. Triple-Tier Units: One double-prong ceiling hook.
- D. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds smooth and flush.
- E. Accessible Lockers: Fabricate as follows:
  1. Locate bottom shelf no lower than 15 inches (381 mm) above the floor.
  2. Where hooks or additional shelves are provided, locate no higher than 48 inches (1219 mm) above the floor.



- F. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; not less than 18 gauge sheet steel approximately 18 degrees pitch. To be installed in addition to the locker flat top with end closures for support. Finished to match lockers.
  - 1. Sloping-top corner fillers, mitered.
- G. Recess Trim: Fabricated with minimum 2-1/2-inch (64-mm) face width and in lengths as long as practical; finished to match lockers.
- H. Filler Panels: Factory fabricated of not less than 16 gauge sheet steel in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.
- I. Boxed End Panels: Fabricated with 1-inch- (25-mm-) wide edge dimension, and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.
  - 1. Formed from 16 gauge cold rolled steel with 1" O.D. double bends on sides and a single bend at top and bottom with no exposed holes or bolts. End panels must be formed with slope at top to cover the ends of slope tops. Provide at all exposed ends. Provide one-piece panels for double-row (back-to-back) locker ends.

## **2.07 ACCESSORIES**

- A. Fasteners: Cadmium, zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.
- B. Anchors: Material, type, and size required for secure anchorage to each substrate.
  - 1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts for corrosion resistance.
  - 2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine walls and floors or support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. GENERAL: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings, and as herein specified.
- B. Install lockers level, plumb, and true; shim as required, using concealed shims.
  - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
  - 2. Anchor single rows of metal lockers to walls near top of lockers and to floor.
  - 3. Anchor back-to-back metal lockers to floor.
- C. Welded Lockers: Connect groups together with manufacturer's standard fasteners, with no exposed fasteners on face frames.
- D. Equipment:
  - 1. Attach hooks with at least two fasteners.
  - 2. Attach door locks on doors using security-type fasteners.
  - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
    - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
    - b. Attach plates to upper shelf of each open-front metal locker, centered, with a least two aluminum rivets.



- E. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
  - 1. Attach recess trim to recessed metal lockers with concealed clips.
  - 2. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
  - 3. Attach sloping-top units to metal lockers, with closures at exposed ends.
  - 4. Attach boxed end panels using concealed fasteners to conceal exposed ends of nonrecessed metal lockers.
- F. Fixed Benches: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 40 inches apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.

### **3.03 ADJUSTING**

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

### **3.04 PROTECTION**

- A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- B. Touch-up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

**END OF SECTION**



**SECTION 10 5613  
METAL STORAGE SHELVING**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Post-and-beam metal storage shelving.

**1.03 COORDINATION**

- A. Coordinate sizes and locations of blocking and backing required for installation of metal storage shelving attached to wall and ceiling assemblies.
- B. Coordinate locations and installation of metal storage shelving that may interfere with ceiling systems including lighting, HVAC, speakers, sprinklers, access panels, electrical switches or outlets, and floor drains.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include rated capacities, construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal storage shelving.
- B. Shop Drawings: For metal storage shelving.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include installation details of connectors, lateral bracing, and special bracing.
- C. Samples: For each type of metal storage shelving and for each color specified, in the following sizes:
  - 1. Vertical Supports: 12 inches (305 mm) tall.
  - 2. Shelves: Full size, but not more than 24 inches wide by 12 inches deep (610 mm wide by 305 mm deep).
  - 3. Connectors: Full size.
  - 4. Shelf-Label Holders: Full size.
- D. Samples for Initial Selection: For each type of metal storage shelving with factory-applied color finishes.
  - 1. Include Samples of accessories involving color selection.
- E. Samples for Verification: For the following components, of size indicated below:
  - 1. Vertical Supports: 12 inches (305 mm) tall.
  - 2. Shelves: Full size, but not more than 24 inches wide by 12 inches deep (610 mm wide by 305 mm deep).
  - 3. Connectors: Full size.
- F. Product Schedule: For metal storage shelving.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Seismic Qualification Certificates: For metal storage shelving, accessories, and components, from manufacturer.
- C. Product Certificates: For each type of metal storage shelving.

**1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For metal storage shelving to include in maintenance manuals.
-



## **1.07 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

## **1.08 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install metal storage shelving until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for building occupants during the remainder of the construction period.

## **PART 1 PRODUCTS**

### **2.01 POST-AND-BEAM METAL STORAGE SHELVING**

- A. Post-and-Beam Metal Shelving: Complying with MH 28.2; field-assembled from factory-formed components. Shelves are supported by beams that span between supporting corner posts that allow beam-height adjustment over full height of shelving unit. Provide fixed top and bottom beams, adjustable intermediate beams, and accessories indicated.
  - B. Load-Carrying Capacity per Shelf: 400 lb (181 kg), uniformly distributed.
  - C. Posts: Fabricated from cold-rolled steel; in manufacturer's standard shape; with perforations at 1-1/2 inches (38 mm) o.c. to receive beam-to-post connectors allowing shelves to be adjusted.
    - 1. Unit Configuration: Configure shelving units as individual, freestanding assemblies.
    - 2. Steel Thickness, Nominal: As required for load-carrying capacity per shelf and number of shelves.
      - a. Add-On Shelf Posts: Fabricated from hot-rolled steel, T-shape; perforated to match main posts and of same thickness.
    - 3. Post Base: Cold-rolled steel floor plate, drilled for floor anchors.
  - D. Beams: Fabricated from cold-rolled steel; in manufacturer's standard shape. Provide beam at each side of each shelf, with center supports as required for load-carrying capacity of shelf.
    - 1. Steel Thickness, Nominal: As required for load-carrying capacity per shelf.
    - 2. Beam-to-Post Connectors: Projecting rivets at each end that engage posts.
      - a. Top and Bottom Shelf Beams: Provide with double beam-to-post connectors.
      - b. Intermediate Shelf Beams: Provide with double beam-to-post connectors.
    - 3. Beam Quantity: As required for number of shelves indicated per shelving unit.
  - E. Flat Metal Shelves: Fabricate fronts, backs, and sides of shelves with box-formed edges, with corners lapped and welded from the following material:
    - 1. Steel Sheet: Nominal thickness as required for load-carrying capacity per shelf.
    - 2. Metallic-Coated Steel Sheet: Nominal Thickness as required for load-carrying capacity per shelf.
  - F. Wire Shelves: Welded steel wire, with Manufacturer's standard openings.
  - G. Shelf Quantity: Five shelves per shelving unit in addition to top and bottom shelf.
  - H. Overall Unit Width: As indicated (inclusive of two end posts).
  - I. Overall Unit Depth: As indicated.
  - J. Overall Unit Height: 84 inches (2134 mm).
  - K. Accessories:
    - 1. Tie Plates: Cold-rolled steel, finished to match posts; designed for joining posts of adjacent shelving units.
    - 2. Supports: Back-to-wall type that bolt to posts; as required for shelving unit stability.
  - L. Steel Finish: Baked enamel or powder coat.
    - 1. Color and Gloss: As selected by Architect from manufacturer's full range.
-



## **2.02 ANCHORS**

- A. Floor Anchors: Galvanized-steel, post-installed expansion anchors. Provide number per unit recommended by manufacturer.
- B. Wall Anchors: Manufacturer's standard, galvanized-steel anchors designed to secure metal storage shelving to adjacent wall. Provide one per shelving unit for each shelving unit adjacent to a wall.

## **2.03 FABRICATION**

- A. Fabricate metal storage shelving components to provide field-assembled units that are square and rigid, with posts plumb and true and shelves flat and free of dents or distortion. Fabricate connections to form a rigid structure, free of buckling and warping.
  - 1. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
  - 2. Build in straps, plates, brackets, and other reinforcements as needed to support shelf loading.
  - 3. Cut, reinforce, drill, and tap metal fabrications to receive hardware, fasteners, and similar items.
- B. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- C. Form edges and corners free of sharp edges or rough areas. Fold back and crimp exposed edges of unsupported sheet metal to form a hem on the concealed side; ease edges of metal plate to radius of approximately 1/32 inch (0.8 mm). Shear and punch metals cleanly and accurately. Remove burrs.
- D. Weld corners and seams continuously to develop strength, minimize distortion, and maintain the corrosion resistance of base metals. At exposed locations, finish welds and surfaces smooth and blended so surface is smooth after finishing and contour of welded surface matches that of adjacent surface. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces before finishing.

## **PART 1 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where metal storage shelving will be installed.
- C. Examine walls to which metal storage shelving will be attached for properly located blocking, grounds, or other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Vacuum and clean finished floor over which metal storage shelving is to be installed.

### **3.03 INSTALLATION**

- A. Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping.
    - 1. Install exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
    - 2. Install braces, straps, plates, brackets, and other reinforcements as needed to support shelf loading and as required for stability.
    - 3. Adjust post-base bolt leveler to achieve level and plumb installation.
    - 4. Anchor shelving units to floor with floor anchors through floor plate. Shim floor plate to achieve level and plumb installation.
    - 5. Connect side-to-side shelving units together.
-



6. Install shelves in each shelving unit at equal spacing.
  - a. Post-and-Beam Metal Storage Shelving: Install beams with beam-to-post connectors fully engaged in post perforations.

#### **3.04 ERECTION TOLERANCES**

- A. Erect post-and-beam metal storage shelving to a maximum tolerance from vertical of 1/4 inch (6 mm) in 84 inches (2134 mm) of height.

#### **3.05 ADJUSTING**

- A. Adjust metal storage shelving so that connectors and other components engage accurately and securely.
- B. Adjust and lubricate operable components to operate smoothly and easily, without binding or warping. Check and readjust operating hardware.
- C. Touch up marred finishes or replace metal storage shelving that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal storage shelving manufacturer.
- D. Replace metal storage shelving components that have been damaged beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**



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**SECTION 11 3013  
RESIDENTIAL APPLIANCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Laundry appliances.

**1.02 REFERENCE STANDARDS**

- A. UL (DIR) - Online Certifications Directory Current Edition.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).

**PART 2 PRODUCTS**

**2.01 LAUNDRY APPLIANCES**

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. Clothes Washer: Top-loading stationary.
  - 1. Size: Large capacity.
  - 2. Controls: Solid state electronic.
  - 3. Cycles: Include normal, permanent press, delicate, soak, automatic soak, and [\_\_\_\_].
  - 4. Motor Speed: Single-speed.
  - 5. Features: Include optional second rinse, bleach dispenser, fabric softener dispenser, self-cleaning lint filter, sound insulation, end of cycle signal, and [\_\_\_\_].
  - 6. Finish: Painted steel , color as indicated.
  - 7. Basis of Design: GE Model GTW840CSNWS, 5.2 Cu. Ft. Capacity Washer with SmartDispense, White, with fill hoses.
- C. Clothes Dryer: Electric, stationary.
  - 1. Size: Large capacity.
  - 2. Controls: Solid state electronic, with electronic moisture-sensing dry control.
  - 3. Temperature Selections: One.
  - 4. Cycles: Include normal, permanent press, knit/delicate, air only, and [\_\_\_\_].
  - 5. Features: Include interior light, reversible door, stationary rack, sound insulation, end of cycle signal, and [\_\_\_\_].
  - 6. Finish: Painted steel , color as indicated.
  - 7. Basis of Design: GE 7.4 Cu. Ft. Capacity Aluminized Alloy Drum Electric Dryer With HE Sensor Dry, Model GTD84ECSNWS - White.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify utility rough-ins are provided and correctly located.

**3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
-



**3.03 ADJUSTING**

- A. Adjust equipment to provide efficient operation.

**3.04 CLEANING**

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.

**END OF SECTION**



**SECTION 12 2413  
ROLLER WINDOW SHADES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Manual roll-up fabric interior window shades.

**1.02 REFERENCES**

- A. NFPA 701-99 - Fire Tests for Flame-Resistant Textiles and Films.
- B. GREENGUARD Environmental Institute Children & Schools
- C. US Green Building Council.

**1.03 SUBMITTALS**

- A. Product Data: Manufacturer's data sheets on each product specified, including:
  - 1. Preparation instructions and recommendations.
  - 2. Installation and maintenance instructions.
  - 3. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
  - 4. Storage and handling requirements and recommendations.
  - 5. Mounting details and installation methods, including integration of hardware with building structure.
- B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, and relationship to adjacent work.
- C. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings, field verified window dimensions, quantities, type of shade, controls, fabric, and color, and include opening sizes and key to typical mounting details.
- D. Selection Samples: For each finish product specified, two complete sets of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two complete sets of shade components, unassembled, demonstrating compliance with specified requirements. Shade fabric sample and aluminum finish sample as selected, representing actual product, color, and patterns. Mark face of material to indicate interior faces.
- F. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.
- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years' experience in manufacturing products comparable to those specified in this section.
- B. NFPA Flame-Test: Passes NFPA 701. Materials tested shall be identical to products proposed for use.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.
- B. Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.
- C. Label containers and shades according to Window Shade Schedule.
- D. Store products in manufacturer's unopened packaging until ready for installation.



## **1.06 SEQUENCING**

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## **1.07 PROJECT CONDITIONS**

- A. Install roller shades after finish work and ambient temperature, humidity and ventilation conditions are maintained at levels recommended for project upon completion.

## **1.08 WARRANTY**

- A. Initial warranty: Provide an initial one-year warranty on all products and services, including installations, to be free from defects. Products or services found to be defective under normal use during this initial warranty period will be repaired or replaced without charge to the customer. Refer to basis of design manufacturer Blueshade® "Best-in-the-Business" warranty. Warranty period shall begin upon completion of the installation.
- B. Extended Warranty: Provide a 5-year limited warranty on motors, controls, and data bus accessories. Provide a 25-year limited warranty on shade cloth and hardware. Refer to basis of design manufacturer BlueShade® "Best-in-the-Business" warranty.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: Blueshade by Drapery Industries Inc., Rochester, NY 14610, 844-737-2533, Web: [www.blueshade.us.com](http://www.blueshade.us.com)
  - 1. Products: Manual Architectural-CM premium clutch roller shades.
- B. Acceptable alternate Manufacturer: provide comparable products by Mechoshade or approved equal.

### **2.02 MANUAL WINDOW SHADES**

- A. Manually operated vertical roll-up shade with fabric, premium clutch, chain, ceiling pocket and bottom closure, and necessary hardware to complete installation. BlueShade manual Architectural-CM series as manufactured by Drapery Industries Inc.
  - 1. Operation: Bead chain and Galaxy-clutch operating mechanism, allowing heavy shades to be operated with reduced pull force. Designed for mid-size shades where weight and tube deflection are an issue. Clutch never needs adjustment or lubrication. Provide limit stops to prevent shade from being raised or lowered too far.
    - a. CM Clutch: Premium mechanical clutch designed for smooth, durable operation over a wide variety of shade sizes and weights. Bi-directional clutch fabricated from POM thermoplastic, comprised of PA6 with glass fiber, and steel spring; Molded chain placement guides allow the chain to drop behind the fascia, eliminating the need to notch the fascia panel. Chain placement right or left. Color as selected by Architect from manufacturer's full range of standard colors.
    - b. Bead chain loop: Stainless steel bead chain hanging at side of window.
    - c. Bead Chain Hold Down: Spring-Loaded Tensioner (P-clip style without tensioner spring is not acceptable). Color as selected by Architect from manufacturer's full range of standard colors.
    - d. Idler Assembly: Provide heavy-duty idler assembly consisting of retractable pin end with metal gear for positive placement, and level adjusting idler bracket. Idler pin designed with retractable geared pin-end to facilitate easy installation, and removal of shade for service. Level adjusting idle end bracket consist of cold rolled steel bracket which is zinc plated and mechanically fastened to a plate assembly made from Acrylonitrile-Butadiene-Styrene (ABS) which is a polymerized alloy. Idler and adapter assembly designed for 1.75" diameter (OD) keyed tube.



2. Roller tube: Keyed tube with a minimum 1.75" diameter (OD) fabricated from extruded aluminum, steel is not acceptable. Diameter, wall thickness, and material selected by manufacturer to accommodate shade size with minimum deflection. Keyed tube design, reduces deflection over wide spans, and the key groove can accept optional fabric spline. Standard fabric connection to roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Welded fabric spline (optional).
  3. Mounting: mounting brackets fabricated from cold rolled steel ASTM A1008, with zinc-plated finish.
- B. Fabric Length: Provide a minimum of 12" greater than window height.
  - C. Shade slat: Aluminum slat 1/8" x 1" MF encased in welded heat seamed hem.
  - D. Orientation: Regular (from back of roller).

### **2.03 FABRIC**

- A. Color and pattern: As selected by Architect from manufacturer's full range.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.

### **3.02 PREPARATION**

- A. Coordinate requirements for blocking and structural supports to ensure adequate means for installation of pocket enclosure brackets, and hardware for installation of manual window shades.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install roller shades level, plumb, square, and true. Allow proper clearances for window operation hardware.
- C. Install after interior construction is essentially complete.
- D. Remove and properly dispose of all debris and metal shavings. Vacuum as necessary.

### **3.04 TESTING AND DEMONSTRATION**

- A. Test window shades to verify that controls, limit stops, interface to other building materials, and other operating components are functional. Correct deficiencies.
- B. Demonstrate operation of shades to Owner's designated representatives.

### **3.05 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

### **3.06 LOCATIONS**

- A. Roller shades shall be provided where indicated.

**END OF SECTION**



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**SECTION 12 3200  
WOOD CASEWORK**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes supplying wood casework; countertops; casework hardware.
  - 1. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

**1.02 REFERENCES**

- A. American National Standards Institute (ANSI).
- B. Architectural Woodwork Institute (AWI): Architectural Woodwork Quality Standards Illustrated, latest edition.
- C. Composite Panel Association Buyer's & Specifier's Guide.

**1.03 DESIGN REQUIREMENTS**

- A. Manufacturers shall be members of AWI, have established quality control criteria.
- B. Casework shall meet or exceed load tests as outlined in ANSI A161.1.
- C. Manufacturers shall comply with special requirements related to the Americans with Disabilities Act, 28 CFR Part 36, ADA Standards for Accessible Design.

**1.04 SUBMITTALS**

- A. Shop Drawings:
  - 1. Indicate casework locations, large-scale plans, elevations, cross sections, rough in and anchor placement dimensions, tolerances and clearances required.
- B. Product Data:
  - 1. Submit component dimensions, configurations, construction details, joint details, and attachments, utility and service requirements and locations.
  - 2. Include manufacturer's literature.
- C. Samples:
  - 1. Wood samples
  - 2. Finish samples
  - 3. Edge banding
  - 4. Hinges
  - 5. Pulls
  - 6. Louvers
  - 7. Grommets
- D. Sample Unit:
  - 1. Submit full-size cabinet, as herein specified.
  - 2. Submitted cabinets may be used in the Project.

**1.05 QUALITY ASSURANCE**

- A. Qualifications:
- B. Mockup:
  - 1. Construct full size mockup including base and upper cabinet, complete with drawers, door and adjustable shelf.
  - 2. Locate where directed by Architect.
  - 3. Incorporate accepted mockup as part of Work.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Provide warranty for manufactured product.
  - B. Accept casework on site; inspect on arrival for damage.
-



- C. Store and handle casework in manner to prevent damage and deterioration.
- D. Provide packaging such as cardboard or other containers, separators, banding, spreaders and paper wrappings to protect metal items.
- E. Store casework in a protected dry area, provided by the Owner, away from direct sunlight, with temperature 70 degrees F (+/- 10) and relative humidity of 25–50%. Casework shall be stored elevated above moisture contact. Storage area must be isolated from outside weather conditions. Casework shall be installed only in areas where temperature and humidity are maintained within the above-stated range.
- F. All cabinets to be complete with hardware attached (or provided loose where not practical to ship attached) with all necessary scribes, fillers and molding; all items to be marked on outside of packaging for identification.
- G. Protect exposed finish surfaces by suitable means.
- H. Coordinate size of access and route to place of installation.

#### **1.07 SEQUENCING AND SCHEDULING**

- A. Coordinate casework installation with location and installation of service utilities.
- B. Sequence installation to accommodate required utility connections.

#### **1.08 WARRANTY**

- A. The manufacturer shall guarantee the casework against defects in materials and workmanship for a period of one year from Date of Substantial Completion.
- B. Warranty shall cover the repair or replacement defective material.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design: Drawings and standards for casework and equipment are based on wood casework as manufactured by Wood-Metal Industries, 100 East Sherman Street, Selinsgrove, PA 17870, (570) 374-1176.
- B. The specifications outline a quality standard necessary for required performance. Only products, which meet or exceed these standards, shall be considered acceptable.
- C. Acceptance of a bid for the required materials does not indicate product acceptance. All manufacturers must meet minimum construction requirements, must submit necessary materials and documentation for approved substitution and must revise their construction as necessary to meet the standards set forth herein.

#### **2.02 MATERIALS**

- A. Wood and plywood grains, hues and matching will vary according to species, seasonal harvesting, manufacturing process and geographic origin. Visible surfaces of installed products shall be in conformance with industry-accepted standards.
  - B. Red oak shall be considered the standard wood species.
  - C. Lumber - All lumber used for cabinet and case exteriors and exposed interiors shall be of selected northern grown hardwood, sound and free from checks and harmful case hardening. Lumber for interior construction shall be unselected as to grain and color. Lumber shall be properly air-dried, scientifically kiln dried in manufacturer's own controlled kilns, and then tempered to optimum moisture content (6-8%) prior to fabrication. All lumber on exposed surfaces shall be of the highest grade hardwood selected for grain and color.
  - D. Plywood (for exposed surfaces)
-



- 
- 1. Oak plywood faces shall be plain sliced grade A and shall meet the definition set forth in ANSI/HPVA HP-1-2004.
  - E. Plywood (for unexposed surfaces)
    - 1. Plywood for unexposed surfaces shall have sound hardwood veneer face and may have color streaks and variations. Appearance shall be consistent with grade 2.
  - F. Hardboard
    - 1. Hardboard is full tempered 2 sides, consisting of steam-exploded wood fibers highly compressed into a hard, dense, 1/4" thick, homogeneous sheet using natural resins and other added binders.
  - G. Particleboard
    - 1. Particleboard shall be commercial-industrial with a nominal 47 pound per cubic foot density.

## 2.03 HARDWARE

- A. Hinges:
    - 1. Standard hinges for wall cabinets, base cabinets and tall cabinet doors shall be of the heavy-duty, wrap around, institutional type with five knuckles, non-removable pin and rounded ends. Hinge swing shall be 270 degrees. Hinges shall be finished in colors selected from the manufacturer's standard colors.
    - 2. Offset kitchen cabinet type, plain butt hinges or hinges with removable pins will not be acceptable.
    - 3. Hinge screws shall be concealed when door is closed.
    - 4. Doors less than 40-1/4" high shall have 2 hinges and those 40-1/4" high and over shall have three hinges.
  - B. Pulls
    - 1. Pulls shall be selected by Owner from manufacturer's full range of styles/shapes. Color/finish to match hinges.
  - C. Drawer Slides
    - 1. Standards slides shall be single extension, bottom-mounted, epoxy powder-coated with positive in stop, out-stop and out keeper, lift-out disconnect, stay-closed design. Slides shall have captive nylon rollers both front and rear, 100 pound load rating and manufacturer's lifetime warranty
    - 2. File and paper storage drawers shall have full extension, 3-part, progressive opening slide, with 100 pound load rating, zinc-coated or epoxy-coated at manufacturer's option.
  - D. Catches
    - 1. Catches shall be double-action, spring tension, nylon roller catch.
    - 2. On all tall cases, catches shall be heavy-duty nylon roller type.
    - 3. Catches shall not be mounted when self-closing hinges are specified.
    - 4. Magnetic catches with door-mounted strike plate shall be provided at no additional cost if selected by Owner.
  - E. Adjustable Shelf supports
    - 1. Surface-mounted, steel shelving standards with adjustable shelf support clips.
  - F. Locks
    - 1. Locks shall be of a removable core design with 5-disk tumbler. Cabinets to be keyed alike per room, each room keyed differently and master-keyed, unless otherwise noted on drawings. All doors, drawers, etc. to be provided with a lock.
    - 2. Two keys shall be provided per lock.
    - 3. A maximum of six master keys shall be provided.
-



## **2.04 MISCELLANEOUS COMPONENTS**

- A. Scheduled wall base shall be applied to the base cabinets.

## **2.05 CONSTRUCTION**

A. General Construction

1. This specification is based on an industry-standard red oak cabinet construction.
2. Top frames, tops, bottoms, intermediate rails, fixed partitions and fixed shelves where applicable to be glued, doweled and screwed to cabinet sides. Cabinets shall be clamped under pressure to insure joint integrity and unit squareness.

B. Counter Tops

1. Hard Wood Tops:
  - a. Wood tops shall be 1-1/4" minimum thickness and shall be built up of maple strips laminated together with a durable finish.

## **2.06 FABRICATION**

A. Base Cabinets:

1. Sides shall be 3/4" thick 7-ply hardwood plywood, exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge.
2. Top assembly shall consist of a horizontal frame with pinned mortise and tenon joints and be secured to cabinet sides with multiple 8-mm hardwood dowels, glued and screwed. The front rail shall be 3/4" thick x 2-3/4" deep oak with side rails 3/4" thick x 1-3/4" deep and a 3/4" thick x 1-3/4" deep back rail.
3. Intermediate rails shall be 3/4" thick x 2-3/4" deep oak and be secured to cabinet sides with 8-mm hardwood dowels on 32-mm centers, glued and screwed.
4. Security panels, if specified, shall consist of (1) a horizontal frame with mortise and tenon joints and a 1/4" thick panel. Front rail shall be 3/4" thick x 2-3/4" deep oak with side rails 3/4" thick x 1-3/4" deep and a 3/4" thick x 1-3/4" deep back rail or (2) [to be used at factory discretion] a 3/4" thick 7-ply hardwood plywood panel with hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge. Both the frame and solid panel to be secured to cabinet sides with multiple 8-mm hardwood dowels glued and screwed.
5. Bottoms shall be 3/4" thick 7-ply hardwood plywood, exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge. Bottom shall be secured to cabinet sides with multiple 8-mm hardwood dowels, glued and screwed.
6. Backs shall be 1/4" thick tempered hardboard, trapped inside grooves, secured with mechanical fasteners and sealed with hot melt adhesive.
7. External hanger rails, 1" thick and a minimum of 3" high, shall be mechanically fastened to both sides and top or bottom.
8. Toe space shall be 4" high x 3-1/4" deep with plywood Toe board 3/4" thick x 4" high, secured between cabinet sides with 8-mm hardwood dowels and attached to bottom panel with hot melt adhesive.

B. Wall Cabinets:

1. Sides shall be 3/4" thick 7-ply hardwood plywood, exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge and .020 oak veneers applied to the top and bottom edge.



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2. Top shall be 1" thick 9-ply hardwood plywood. Exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge. Panel to be secured to cabinet sides with multiple 8-mm hardwood dowels, glued and screwed.
  3. Bottoms shall be 1" thick 9-ply hardwood plywood. Exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge. Bottom is full depth with rabbet cut into rear edge to conceal back and external hanger rail and is secured to cabinet sides with multiple 8-mm hardwood dowels, glued and screwed. Underside of bottom is considered unexposed and shall be surfaced with sound hardwood veneer faces.
  4. Backs shall be 1/4" thick tempered hardboard, trapped inside grooves, secured with mechanical fasteners and sealed with hot melt adhesive.
  5. External hanger rails, 1" thick and a minimum of 3" high, shall be mechanically fastened to sides, top and bottom.
- C. Tall Cabinets:
1. Sides shall be 3/4" thick 7-ply hardwood plywood. Exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge.
  2. Top shall be 1" thick 9-ply hardwood plywood. Exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge. Panel to be secured to cabinet sides with multiple 8-mm hardwood dowels, glued and screwed.
  3. Bottoms shall be 3/4" thick 7-ply hardwood plywood, exposed surfaces faced with oak hardwood veneers and unexposed surfaces with sound hardwood veneer faces. A 3/8" oak hardwood nosing shall be applied to the exposed front edge. Bottom shall be secured to cabinet sides with multiple 8-mm hardwood dowels, glued and screwed.
  4. Backs shall be 1/4" thick tempered hardboard, trapped inside grooves, secured with mechanical fasteners and sealed with hot melt adhesive.
  5. External hanger rails, 1" thick and a minimum of 3" high, shall be mechanically fastened to both sides, top and bottom.
  6. Toe space shall be 4" high x 3-1/4" deep with plywood toe board 3/4" thick x 4" high, secured between cabinet sides with 8mm hardwood dowels and attached to bottom panel with hot melt adhesive.
- D. Drawers and doors:
1. Drawer head style:
    - a. Overlay Square Edge 3/4" thick particleboard faced on both sides with oak hardwood veneer. 3mm oak edge banding applied to all four edges with hot melt adhesive. Grain direction shall be horizontal.
  2. Drawer sides, back and fronts shall be 1/2" thick solid oak. Top edges shall be radius and free of rough edges.
  3. A separate drawer head (of the style selected) shall be applied to the front of the drawer box.
  4. Drawer boxes shall be assembled with glued dovetail construction at all four corners.
  5. Drawer bottoms shall be 1/4" thick tempered hardboard and trapped in grooved drawer box.
  6. Underside of drawer to be secured with mechanical fasteners and sealed with a continuous bead of hot melt adhesive to enhance drawer integrity.
  7. Reinforce drawer bottoms with a hardwood front-to-back intermediate underbody stiffener, hot melt glued and fastened; one above 24" and two at 42" and wider.
  8. Provide clip and rail hanging file system for legal or letter size as indicated by manufacturer's model number.
  9. Door style
-



- a. Overlay Square Edge-Doors shall be particleboard faced on both sides with oak hardwood veneer. 3mm oak edge banding applied to all four edges with hot melt adhesive. Grain direction shall be vertical. Nominal finished door thickness for base and wall cabinets shall be  $\frac{3}{4}$ ". Nominal door thickness for tall cabinets shall be 1-1/16".
- 10. Adjustable Shelves:
  - a. Shelves less than 30" in width shall be  $\frac{3}{4}$ " thick. Shelves 30" and wider shall be 1" thick.
  - b. Exposed shelves shall be hardwood plywood, surfaces faced with oak hardwood veneers.
  - c. Non-exposed shelves shall be hardwood plywood, surfaces faced with sound hardwood veneers.
  - d. A 3/8" oak hardwood nosing shall be applied to the exposed front edge.
  - e. Shelves shall be full depth and adjustable on 32-mm centers.
  - f. All cabinets (base, tall, wall) shall have adjustable shelving in quantities to match the casework it replaces. Shelf supports shall be provide full height of the cabinet.
- 11. Fixed Shelves:
  - a. Exposed shelves shall be hardwood plywood, surfaces faced with oak hardwood veneers.
  - b. Non-exposed shelves shall be hardwood plywood, surfaces faced with sound hardwood veneers.
  - c. A 3/8" oak hardwood nosing shall be applied to the exposed front edge.
  - d. All non-supported fixed shelves and exposed shelves shall be 1" thick.
  - e. All supported fixed shelves shall be  $\frac{3}{4}$ " thick.
  - f. Shelves shall be full depth and be secured to cabinet sides or partitions with multiple 8-mm hardwood dowels, glued and screwed.

## **2.07 FINISH AND PERFORMANCE REQUIREMENTS**

- A. Finish shall be a synthetic water-white alkyd aminoplast conversion coating specially formulated for commercial applications.
- B. All surfaces shall be prepared by a thorough sanding and sealing prior to staining.
- C. A pigmented stain shall be hand wiped on wood components.

## **2.08 COLORS**

- A. Selected by the Architect from the manufacturer's standard color selection. Color selection shall include no less than ten standard colors.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install casework, components and accessories under manufacturer representative's supervision, using skilled labor especially trained for this work. Cabinets are to be installed in a professional and industry-accepted manner, including all scribes, moldings and necessary trim, complete and in operating condition.
- B. Set casework items plumb and square, securely anchored to building structure.
- C. Furnish casework complete with trim strips, fillers, backs, etc., as may be required.
- D. Field touch-up blemishes to original finish as approved and accepted by the Owner.

### **3.02 DISCARD OR REMOVE AND REPLACE DAMAGED MEMBERS.**

### **3.03 ADJUSTING**

- A. Adjust doors, drawers, hardware and other moving or operating parts to function smoothly.



- B. Adjustable shelves shall be installed consistent with the shop drawings.

#### **3.04 CLEANING**

- A. All packaging material and installation-related debris shall be removed from the site.
- B. Installer shall remove all pencil marks, adhesive and sawdust resulting from this work.
- C. Casework shall be cleaned inside and out to remove the installation related dust and debris.

#### **3.05 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Protect installed casework.

**END OF SECTION**



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**SECTION 22 0500  
COMMON WORK RESULTS FOR PLUMBING****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. This Section includes the following:
  - 1. Piping materials and installation instructions common to most piping systems.
  - 2. Transition fittings.
  - 3. Dielectric fittings.
  - 4. Mechanical sleeve seals.
  - 5. Sleeves.
  - 6. Escutcheons.
  - 7. Grout.
  - 8. Painting and finishing.
  - 9. Supports and anchorages.

**1.03 DEFINITIONS**

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- D. The following are industry abbreviations for plastic materials:
  - 1. ABS: Acrylonitrile-butadiene-styrene plastic.
  - 2. CPVC: Chlorinated polyvinyl chloride plastic.
  - 3. PE: Polyethylene plastic.
  - 4. PVC: Polyvinyl chloride plastic.
- E. The following are industry abbreviations for rubber materials:
  - 1. EPDM: Ethylene-propylene-diene terpolymer rubber.
  - 2. NBR: Acrylonitrile-butadiene rubber.

**1.04 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Transition fittings.
  - 2. Dielectric fittings.
  - 3. Mechanical sleeve seals.
  - 4. Escutcheons.
- B. Welding certificates.

**1.05 QUALITY ASSURANCE**

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
  - B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
    - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
-



2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

#### **1.07 COORDINATION**

- A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for plumbing installations.
- B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- C. Coordinate requirements for access panels and doors for plumbing items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

### **PART 1 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

#### **2.02 PIPE, TUBE, AND FITTINGS**

- A. Refer to individual Division 22 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

#### **2.03 JOINING MATERIALS**

- A. Refer to individual Division 22 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
  1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
    - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
    - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
  2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.



- F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.
- G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- H. Solvent Cements for Joining Plastic Piping:
  - 1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

## 2.04 TRANSITION FITTINGS

- A. Flexible Transition Couplings for Underground Nonpressure Drainage Piping: ASTM C 1173 with elastomeric sleeve, ends same size as piping to be joined, and corrosion-resistant metal band on each end.
  - 1. Manufacturers:
    - a. Cascade Waterworks Mfg. Co.
    - b. Fernco, Inc.
    - c. Mission Rubber Company.
    - d. Plastic Oddities, Inc.

## 2.05 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).
  - 1. Manufacturers:
    - a. Capitol Manufacturing Co.
    - b. Central Plastics Company.
    - c. Eclipse, Inc.
    - d. Epco Sales, Inc.
    - e. Hart Industries, International, Inc.
    - f. Watts Industries, Inc.; Water Products Div.
    - g. Zurn Industries, Inc.; Wilkins Div.
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150-psig (1035-kPa) minimum working pressure as required to suit system pressures.
  - 1. Manufacturers:
    - a. Capitol Manufacturing Co.
    - b. Central Plastics Company.
    - c. Epco Sales, Inc.
    - d. Watts Industries, Inc.; Water Products Div.
- E. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).
  - 1. Manufacturers:
    - a. Perfection Corp.
    - b. Precision Plumbing Products, Inc.
    - c. Sioux Chief Manufacturing Co., Inc.
    - d. Victaulic Co. of America.

## 2.06 MECHANICAL SLEEVE SEALS

- A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.



1. Manufacturers:
  - a. Advance Products & Systems, Inc.
  - b. Calpico, Inc.
  - c. Metraflex Co.
  - d. Pipeline Seal and Insulator, Inc.
2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

## 2.07 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
  1. Underdeck Clamp: Clamping ring with set screws.
- E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe: ASTM D 1785, Schedule 40.
- G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

## 2.08 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
  1. Finish: Polished chrome-plated and rough brass.
- D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
  1. Finish: Polished chrome-plated.
- E. One-Piece, Stamped-Steel Type: With set screw or spring clips and chrome-plated finish.
- F. Split-Plate, Stamped-Steel Type: With concealed hinge, set screw or spring clips, and chrome-plated finish.
- G. One-Piece, Floor-Plate Type: Cast-iron floor plate.
- H. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

## 2.09 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
  1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
  2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
  3. Packaging: Premixed and factory packaged.



**PART 1 EXECUTION****3.01 PIPING SYSTEMS - COMMON REQUIREMENTS**

- A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.
  - B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
  - C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
  - D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
  - E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
  - F. Install piping to permit valve servicing.
  - G. Install piping at indicated slopes.
  - H. Install piping free of sags and bends.
  - I. Install fittings for changes in direction and branch connections.
  - J. Install piping to allow application of insulation.
  - K. Select system components with pressure rating equal to or greater than system operating pressure.
  - L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
    - 1. New Piping:
      - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
      - b. Chrome-Plated Piping: One-piece, cast-brass type with polished chrome-plated finish.
      - c. Insulated Piping: One-piece, stamped-steel type with spring clips.
      - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
      - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
      - f. Bare Piping at Ceiling Penetrations in Finished Spaces: Split-plate, stamped-steel type with concealed hinge and set screw.
      - g. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type with set screw or spring clips.
      - h. Bare Piping in Equipment Rooms: One-piece, stamped-steel type with set screw or spring clips.
      - i. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece, floor-plate type.
  - M. Sleeves are not required for core-drilled holes.
  - N. Permanent sleeves are not required for holes formed by removable PE sleeves.
  - O. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
  - P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
    - 1. Cut sleeves to length for mounting flush with both surfaces.
-



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- a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
  2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
  3. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
    - a. Steel Pipe Sleeves: For pipes smaller than NPS 6 (DN 150).
    - b. Steel Sheet Sleeves: For pipes NPS 6 (DN 150) and larger, penetrating gypsum-board partitions.
  4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.
- Q. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
  2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
  3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- R. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- S. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.
- T. Verify final equipment locations for roughing-in.
- U. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

### 3.02 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.
  - B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
  - C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
  - D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
  - E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
  - F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
-



1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
  2. PVC Nonpressure Piping: Join according to ASTM D 2855.
- J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

### **3.03 PIPING CONNECTIONS**

- A. Make connections according to the following, unless otherwise indicated:
  1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
  2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
  3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
  4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

### **3.04 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS**

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

### **3.05 PAINTING**

- A. Painting of plumbing systems, equipment, and components is specified in Division 09 Sections "Interior Painting" and "Exterior Painting."
- B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

### **3.06 ERECTION OF METAL SUPPORTS AND ANCHORAGES**

- A. Refer to Division 05 Section "Metal Fabrications" for structural steel.
  - B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.
  - C. Field Welding: Comply with AWS D1.1.
-



**3.07 ERECTION OF WOOD SUPPORTS AND ANCHORAGES**

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

**3.08 GROUTING**

- A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

**END OF SECTION**



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**SECTION 22 0517**  
**SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Pipe sleeves.
- B. Stack-Sleeve fittings.
- C. Sleeve-Seal Fittings
- D. Grout

**1.03 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 09 9123 - Interior Painting: Preparation and painting of interior piping systems.
- C. Section 22 0523 - General-Duty Valves for Plumbing Piping.
- D. Section 22 0553 - Identification for Plumbing Piping and Equipment: Piping identification.
- E. Section 22 0719 - Plumbing Piping Insulation.

**1.04 REFERENCE STANDARDS**

- A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type) 2016.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified this section.
  - 1. Minimum three years experience.
  - 2. Approved by manufacturer.
- C. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

**1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
-



**PART 2 PRODUCTS****2.01 PIPE SLEEVES**

- A. Manufacturers:
  - 1. Flexicraft Industries; Pipe Wall Sleeve: [www.flexicraft.com/#sle](http://www.flexicraft.com/#sle).
  - 2. Smith, Jay R. Mfg. Co..
  - 3. Zurn Specification Drainage Operation; Zurn Plumbing Products Group..
  - 4. Presealed Systems.
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
  - 6. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.
- B. Vertical Piping:
  - 1. Sleeve Length: 1 inch above finished floor.
  - 2. Provide sealant for watertight joint.
  - 3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.
  - 4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.
- C. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- D. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.
- E. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.Pipe
- F. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- G. Clearances:
  - 1. Provide allowance for insulated piping.
  - 2. Wall, Floor, Floor, Partitions, and Beam Flanges: 1 inch greater than external; pipe diameter.
  - 3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.

**2.02 STACK-SLEEVE FITTINGS**

- A. Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
  - 1. Underdeck Clamp: Clamping rings with setscrews.

**2.03 SLEEVE-SEAL SYSTEMS**

- A. Manufactured plastic, sleeve-type, water stop assemblies made for imbedding in concrete slab or wall. Unit has plastic or rubber water stop collar with center opening to match piping OD.

**2.04 GROUT**

- A. Standard: ASTM C 1107/C1107M Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
  - B. Characteristics: Non shrink; recommended for interior and exterior applications.
  - C. Design Mix: 5000-psi, 28 day compressive strength.
  - D. Packaging: Premix and factory packaged.
-



**MANUFACTURERS:****3.01 ADVANCE PRODUCTS & SYSTEMS, LLC; INNERLYNX: [WWW.APSONLINE.COM/#SLE](http://WWW.APSONLINE.COM/#SLE).****3.02 FLEXICRAFT INDUSTRIES; PIPESEAL: [WWW.FLEXICRAFT.COM/#SLE](http://WWW.FLEXICRAFT.COM/#SLE).****3.03 SUBSTITUTIONS: SEE SECTION 01 6000 - PRODUCT REQUIREMENTS.****3.04 MODULAR/MECHANICAL SEAL:**

- A. Synthetic rubber interlocking links continuously fill annular space between pipe and wall/casing opening.
- B. Provide watertight seal between pipe and wall/casing opening.
- C. Elastomer element size and material in accordance with manufacturer's recommendations.
- D. Glass reinforced plastic pressure end plates.

**3.05 GROUT****PART 3 EXECUTION****4.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

**4.02 INSTALLATION**

- A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- B. Install piping to conserve building space, to not interfere with use of space and other work.
- C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- D. Provide sleeves when penetrating footings, floors, walls, partitions, and [\_\_\_\_\_]. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
  - 1. Aboveground Piping:
    - a. Pack solid using mineral fiber complying with ASTM C592.
    - b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
  - 2. All Rated Openings: Caulk tight with fire stopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.
- E. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

**4.03 CLEANING**

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.
- C. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

**END OF SECTION**



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**SECTION 22 0523**  
**GENERAL-DUTY VALVES FOR PLUMBING PIPING****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Ball valves.
- B. Check valves.

**1.03 RELATED REQUIREMENTS**

- A. Section 22 0553 - Identification for Plumbing Piping and Equipment.
- B. Section 22 0719 - Plumbing Piping Insulation.
- C. Section 22 1005 - Plumbing Piping.

**1.04 ABBREVIATIONS AND ACRONYMS**

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. NRS: Non-rising stem.
- E. OS&Y: Outside screw and yoke.
- F. PTFE: Polytetrafluoroethylene.
- G. RS: Rising stem.

**1.05 REFERENCE STANDARDS**

- A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch 2013 (Reaffirmed 2018).
- B. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves 2017.
- C. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- D. ASME B31.9 - Building Services Piping 2020.
- E. ASTM B61 - Standard Specification for Steam or Valve Bronze Castings 2015 (Reapproved 2021).
- F. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings 2017.
- G. MSS SP-67 - Butterfly Valves 2017, with Errata.
- H. MSS SP-72 - Ball Valves with Flanged or Butt-Welding Ends for General Service 2010a.
- I. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves 2019.
- J. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .
- K. NSF 61 - Drinking Water System Components - Health Effects 2020.
- L. NSF 372 - Drinking Water System Components - Lead Content 2020.

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
-



- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

### **1.07 QUALITY ASSURANCE**

- A. Manufacturer:
  - 1. Obtain valves for each valve type from single manufacturer.

### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Prepare valves for shipping as follows:
  - 1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
  - 2. Protect valve parts exposed to piped medium against rust and corrosion.
  - 3. Protect valve piping connections such as grooves, weld ends, threads, and flange faces.
  - 4. Adjust globe, gate, and angle valves to the closed position to avoid clattering.
  - 5. Secure check valves in either the closed position or open position.
  - 6. Adjust butterfly valves to closed or partially closed position.
- B. Use the following precautions during storage:
  - 1. Maintain valve end protection and protect flanges and specialties from dirt.
    - a. Provide temporary inlet and outlet caps.
    - b. Maintain caps in place until installation.
  - 2. Store valves in shipping containers and maintain in place until installation.
    - a. Store valves indoors in dry environment.
    - b. Store valves off the ground in watertight enclosures when indoor storage is not an option.

### **1.09 EXERCISE THE FOLLOWING PRECAUTIONS FOR HANDLING:**

- A. Handle large valves with sling, modified to avoid damage to exposed parts.
- B. Avoid the use of operating handles or stems as rigging or lifting points.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
  - 1. Conbraco Industries Inc.; Apollo Valves.
  - 2. Crane Co.; Crane Valve Group; Crane Valves.
  - 3. Hammond Valve
  - 4. Milwaukee Valve Company
  - 5. NIBCO INC.
  - 6. Red-White Valve Corporation
  - 7. Watts Regulator Co.; a division of Watts Water Technologies. Inc.

### **2.02 APPLICATIONS**

- A. Provide the following valves for the applications if not indicated on drawings:
  - 1. Shutoff: Ball, butterfly, gate.
  - 2. Dead-End: Single-flange butterfly (lug) type.
  - 3. Throttling: Provide globe.
- B. Substitutions of valves with higher CWP classes or SWP ratings for same valve types are permitted when specified CWP ratings or SWP classes are not available.
- C. Domestic, Hot and Cold Water Valves:
  - 1. 2 NPS and Smaller:
    - a. Ball: One piece, full port, brass with brass trim.



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**2.03 GENERAL REQUIREMENTS**

- A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.
- B. Valve Sizes: Match upstream piping unless otherwise indicated.
- C. Valve Actuator Types:
  - 1. Hand Lever: Quarter-turn valves 6 NPS and smaller except plug valves.
- D. Valves in Insulated Piping: With 2 NPS stem extensions and the following features:
  - 1. Gate Valves: Rising stem.
  - 2. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
- E. Valve-End Connections:
  - 1. Threaded End Valves: ASME B1.20.1.
  - 2. Solder Joint Connections: ASME B16.18.
- F. General ASME Compliance:
  - 1. Solder-joint Connections: ASME B16.18.
  - 2. Building Services Piping Valves: ASME B31.9.
- G. Potable Water Use:
  - 1. Certified: Approved for use in compliance with NSF 61 and NSF 372.
  - 2. Lead-Free Certified: Wetted surface material includes less than 0.25 percent lead content.
- H. Source Limitations: Obtain each valve type from a single manufacturer.

**2.04 BRONZE, BALL VALVES**

- A. General:
    - 1. Fabricate from dezincification resistant material.
    - 2. Copper alloys containing more than 15 percent zinc are not permitted.
  - B. One Piece, Reduced Port with Bronze Trim:
    - 1. Comply with MSS SP-110.
    - 2. SWP Rating: 400 psig.
    - 3. CWP Rating: 600 psig.
    - 4. Body: Bronze.
    - 5. Ends: Press.
    - 6. Seats: PTFE.
    - 7. Stem: Bronze.
    - 8. Ball: Chrome plated brass.
    - 9. Manufacturers:
      - a. Viega LLC; [ ]: [www.viega.us/#sle](http://www.viega.us/#sle).
      - b. Substitutions: See Section 01 6000 - Product Requirements.
  - C. Two Piece, Full Port with Bronze Trim:
    - 1. Comply with MSS SP-110.
    - 2. SWP Rating: 150 psig.
    - 3. CWP Rating: 600 psig.
    - 4. Body: Forged bronze or dezincified-brass alloy.
    - 5. Ends: Threaded.
    - 6. Seats: PTFE.
    - 7. Stem: Bronze.
    - 8. Ball: Chrome plated brass.
    - 9. Manufacturers:
-



- a. Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
- b. Viega LLC; [ ]: [www.viega.us/#sle](http://www.viega.us/#sle).
- c. Jomar Valves, a division of Jomar Group; [ ]: [www.jomarvalve.com/#sle](http://www.jomarvalve.com/#sle).
- d. Substitutions: See Section 01 6000 - Product Requirements.

## **2.05 BRONZE, LIFT CHECK VALVES**

- A. General:
  1. Fabricate from dezincification resistant material.
  2. Copper alloys containing more than 15 percent zinc are not permitted.
- B. Class 125:
  1. Comply with MSS SP-80, Type 1, Metal Disc to Metal Seat and Type 2, Nonmetallic Disc to Metal Seat.
  2. CWP Rating: 200 psig.
  3. Design: Vertical flow.
  4. Body: Comply with ASTM B61 or ASTM B62, bronze.
  5. Ends: Threaded as indicated.

## **2.06 BRASS, HORIZONTAL SWING CHECK VALVES**

- A. Threaded End-Connections:
  1. Class 125: CWP Rating: 200 psig, WOG.
  2. Body: Forged brass.
  3. Disc: Forged brass.
  4. Hinge-Pin, Screw, and Cap: Forged brass.
  5. Manufacturers:
    - a. Jomar Valves, a division of Jomar Group; [ ]: [www.jomarvalve.com/#sle](http://www.jomarvalve.com/#sle).
- B. Press End-Connections:
  1. Class 125: CWP Rating: 200 psig, WOG.
  2. Body: Forged brass.
  3. Disc: Forged brass.
  4. Hinge-Pin, Screw, and Cap: Forged brass.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Discard all packing materials and verify that valve interior, including threads and flanges are completely clean without signs of damage or degradation that could result in leakage.
- B. Verify valve parts to be fully operational in all positions from closed to fully open.
- C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.
- D. Should valve is determined to be defective, replace with new valve.

### **3.02 INSTALLATION**

- A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.
- B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.
- C. Where valve support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- D. Install check valves where necessary to maintain direction of flow as follows:
  1. Lift Check: Install with stem plumb and vertical.
  2. Swing Check: Install horizontal maintaining hinge pin level.



3. Orient plate-type into horizontal or vertical position, between flanges.

**END OF SECTION**



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**SECTION 22 0529**  
**HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Support and attachment components for equipment, piping, and other plumbing work.

**1.03 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 05 5000 - Metal Fabrications: Materials and requirements for fabricated metal supports.

**1.04 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- E. MFMA-4 - Metal Framing Standards Publication 2004.
- F. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
  - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
  - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
  - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
  - 5. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

**1.06 DEFINITIONS**

- A. MSS: Manufacturers Standardization Society of the Valve and Fitting Industry Inc.

**1.07 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
-



- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ACSE/SEI7.
  - 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, systems contents, and test water.
  - 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

#### 1.08 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

#### 1.09 QUALITY ASSURANCE

- A. Comply with applicable building code.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

### PART 2 PRODUCTS

#### 2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
  - 1. Comply with MSS SP-58.
  - 2. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.
  - 3. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
  - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of [\_\_\_\_]. Include consideration for vibration, equipment operation, and shock loads where applicable.
  - 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
    - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
    - b. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
    - c. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Metal Channel (Strut) Framing Systems:
  - 1. Manufacturers:
    - a. Cooper B-Line, a division of Eaton Corporation; [\_\_\_\_]: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
    - b. Unistrut, a brand of Atkore International Inc; [\_\_\_\_]: [www.unistrut.com/#sle](http://www.unistrut.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
    - d. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.
  - 2. Comply with MFMA-4.
- C. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.



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1. Minimum Size, Unless Otherwise Indicated or Required:
    - a. Equipment Supports: 1/2 inch diameter.
    - b. Piping up to 1 inch (27 mm) nominal: 1/4 inch diameter.
    - c. Piping larger than 1 inch (27 mm) nominal: 3/8 inch diameter.
    - d. Trapeze Support for Multiple Pipes: 3/8 inch diameter.
  - D. Thermal Insulated Pipe Supports:
    1. General Construction and Requirements:
      - a. Insulated pipe supports to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
      - b. Surface Burning Characteristics: Flame spread index/smoke developed index of 5/30, maximum, when tested in accordance with ASTM E84 or UL 723.
      - c. Pipe supports to be provided for nominally sized, 1/2 inch to 30 inch iron pipes.
      - d. Insulation inserts to consist of rigid phenolic foam insulation surrounded by a 360 degree, PVC jacketing.
  - E. Pipe Supports:
    1. Liquid Temperatures Up To 122 degrees F:
      - a. Overhead Support: MSS SP-58 Types 1, 3 through 12.
      - b. Support From Below: MSS SP-58 Types 35 through 38.
  - F. Anchors and Fasteners:
    1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
  - B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
  - C. Unless specifically indicated or approved by Architect/Engineer, do not provide support from suspended ceiling support system or ceiling grid.
  - D. Unless specifically indicated or approved by Architect/Engineer, do not provide support from roof deck.
  - E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
  - F. Provide thermal insulated pipe supports complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.
  - G. Equipment Support and Attachment:
    1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
    2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
    3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
    4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
-



- H. Secure fasteners according to manufacturer's recommended torque settings.
- I. Remove temporary supports.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

**END OF SECTION**



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**SECTION 22 0553**  
**IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Stencils.
- D. Pipe markers.

**1.03 RELATED REQUIREMENTS**

- A. Section 09 9123 - Interior Painting: Identification painting.

**1.04 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems 2020.
- B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials 2017.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION APPLICATIONS**

- A. Piping: Tags.
- B. Pumps: Nameplates.

**2.02 NAMEPLATES**

- A. Manufacturers:
  - 1. Brimar Industries, Inc; [ ]: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Kolbi Pipe Marker Co; [ ]: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 3. Seton Identification Products; [ ]: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Description: Laminated three-layer plastic with engraved letters.
  - 1. Letter Color: White.
  - 2. Letter Height: 1/4 inch.
  - 3. Background Color: Black.
  - 4. Plastic: Comply with ASTM D709.

**2.03 TAGS**

- A. Manufacturers:
    - 1. Brimar Industries, Inc; [ ]: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
    - 2. Kolbi Pipe Marker Co; [ ]: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
    - 3. Seton Identification Products; [ ]: [www.seton.com/#sle](http://www.seton.com/#sle).
    - 4. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
  - C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.
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**2.04 STENCILS**

- A. Manufacturers:
  - 1. Brady Corporation; [ ]: [www.bradycorp.com/#sle](http://www.bradycorp.com/#sle).
  - 2. Kolbi Pipe Marker Co.; [ ]: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 3. Seton Identification Products; [ ]: [www.seton.com/#sle](http://www.seton.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Stencils: With clean cut symbols and letters of following size:
  - 1. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
- C. Stencil Paint: As specified in Section 09 9123, semi-gloss enamel, colors complying with ASME A13.1.

**2.05 PIPE MARKERS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc; [ ]: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Kolbi Pipe Marker Co; [ ]: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 3. Seton Identification Products; [ ]: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Comply with ASME A13.1.
- C. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- D. Color code as follows:
  - 1. Domestic Water, Storm Drainage, Waste & Vent: Green with white letters.

**PART 3 EXECUTION****3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Section 09 9123 for stencil painting.

**3.02 INSTALLATION**

- A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Apply stencil painting in accordance with Section 09 9123.
- D. Install plastic pipe markers in accordance with manufacturer's instructions.
- E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- G. Use tags on piping 3/4 inch diameter and smaller.
  - 1. Identify service, flow direction, and pressure.
  - 2. Install in clear view and align with axis of piping.
  - 3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

**END OF SECTION**

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**SECTION 22 0719  
PLUMBING PIPING INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cellular glass insulation.
- B. Flexible removable and reusable blanket insulation.
- C. Glass fiber insulation.
- D. Jacket insulation.
- E. Section includes insulating the following pipe systems,
  - 1. Domestic Cold Water Piping
  - 2. Domestic Hot Water Piping
  - 3. Domestic recirculating hot water piping

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 09 9123 - Interior Painting: Painting insulation jacket.
- C. Section 22 1005 - Plumbing Piping: Placement of hangers and hanger inserts.

**1.03 REFERENCE STANDARDS**

- A. ASME A112.18.1 - Plumbing Supply Fittings 2018, with Errata.
- B. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019.
- C. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement 2007 (Reapproved 2019).
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form 2020a.
- E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation 2019.
- F. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation 2021a.
- G. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing 2010 (Reapproved 2016).
- H. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel 2008 (Reapproved 2018).
- I. ASTM C1695 - Standard Specification for Fabrication of Flexible Removable and Reusable Blanket Insulation for Hot Service 2020.
- J. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics 2019.
- K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
  - B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
  - C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.
-



### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.
- B. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.
- C. Maintain ambient conditions required by manufacturers of each product.
- D. Maintain temperature before, during, and after installation for minimum of 24 hours.

### **1.07 COORDINATION**

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

### **1.08 FIELD CONDITIONS**

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

## **PART 2 PRODUCTS**

### **2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

### **2.02 GLASS FIBER INSULATION**

- A. Manufacturers:
    - 1. CertainTeed Corporation; [ ]: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - 2. Johns Manville Corporation; [ ]: [www.jm.com/#sle](http://www.jm.com/#sle).
    - 3. Knauf Insulation; Earthwool 1000 Degree Pipe Insulation: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
    - 4. Owens Corning Corporation; Fiberglas Pipe Insulation ASJ: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
    - 5. Owens Corning Corporation; VaporWick Pipe Insulation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
    - 6. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
    - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
    - 2. Maximum Service Temperature: 850 degrees F.
    - 3. Maximum Moisture Absorption: 0.2 percent by volume.
  - C. (Non exposed existing and new piping) - Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches. (Note: provide new insulation on the existing piping at the point of connection at approximately 5'-0" both upsteam and down stream at point of connection.)
  - D. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
-



- E. (Exposed existing and new piping) - Breather Mastic: Vinyl emulsion type acrylic, compatible with insulation, color to be selected by Architect

## **2.03 CELLULAR GLASS INSULATION**

- A. Insulation: ASTM C552, Type II, Grade 6.
  - 1. K Value: 0.35 at 100 degrees F.
  - 2. Service Temperature Range: From 250 degrees F to 800 degrees F.
  - 3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
  - 4. Water Absorption: 0.5 percent by volume, maximum.

## **2.04 JACKET INSULATION**

- A. PVC Plastic.
  - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
    - a. Minimum Service Temperature: 0 degrees F.
    - b. Maximum Service Temperature: 150 degrees F.
    - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
    - d. Thickness: 10 mil.
    - e. Connections: Brush on welding adhesive.
- B. ABS Plastic:
  - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
    - a. Minimum Service Temperature: Minus 40 degrees F.
    - b. Maximum Service Temperature: 180 degrees F.
    - c. Moisture Vapor Permeability: 0.012 perm inch, when tested in accordance with ASTM E96/E96M.
    - d. Thickness: 30 mil.
    - e. Connections: Brush on welding adhesive.
- C. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire retardant lagging adhesive.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- E. Install cellular melamine with factory-applied jackets with a manufacturer-approved adhesive along seams, both straight lap joints and circumferential lap joints.
  - 1. Install seal over seams with factory-approved room temperature vulcanization (RTV) silicone sealant to ensure a positive vapor barrier seal in outdoor and sanitary washdown environments.
- F. Glass fiber insulated pipes conveying fluids below ambient temperature:
  - 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.



2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- G. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- H. Inserts and Shields:
  1. Application: Piping 1-1/2 inches diameter or larger.
  2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
  3. Insert Location: Between support shield and piping and under the finish jacket.
  4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
  5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
- J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

### 3.03 INDOOR PIPING INSULATION SCHEDULE

- A. **Domestic Cold Water:**
  1. NPS 1 and Smaller: Insulation shall be one of the following:
    - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
  2. NPS 1-1/4 and Larger: Insulation shall be one of the following:
    - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- B. **Domestic Hot and Recirculated Hot Water (105-140 F):**
  1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:
    - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inch thick.
  2. NPS 1-1/2 and Larger: Insulation shall be one of the following:
    - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inch thick.

### 3.04 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed:
- D. Piping, Exposed:
  1. PVC: 20 mils thick.

### 3.05 SCHEDULES

- A. Plumbing Systems:
  1. Domestic Hot Water Supply:
    - a. Glass Fiber Insulation:
  2. Domestic Hot Water Recirculation:
    - a. Glass Fiber Insulation:
      - 1) Pipe Size Range: All sizes.
      - 2) Thickness: 1 inch.
  3. Domestic Cold Water:

**END OF SECTION**



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**SECTION 22 1005  
PLUMBING PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Pipe, pipe fittings, specialties, and connections for piping systems.
  - 1. Sanitary sewer.
  - 2. Domestic water.
  - 3. Flanges, unions, and couplings.
  - 4. Pipe hangers and supports.
  - 5. Manufactured sleeve-seal systems.
  - 6. Balancing valves.
  - 7. Relief valves.
  - 8. Strainers.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 08 3100 - Access Doors and Panels.
- C. Section 09 9123 - Interior Painting.
- D. Section 22 0553 - Identification for Plumbing Piping and Equipment.
- E. Section 22 0719 - Plumbing Piping Insulation.
- F. Section 33 0110.58 - Disinfection of Water Utility Piping Systems.

**1.03 REFERENCE STANDARDS**

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2018.
- C. ASME B31.9 - Building Services Piping 2020.
- D. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators 2021.
- E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings 1999, with Editorial Revision (2018).
- F. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings 2021.
- G. ASTM B32 - Standard Specification for Solder Metal 2020.
- H. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes 2020.
- I. ASTM B68/B68M - Standard Specification for Seamless Copper Tube, Bright Annealed 2019.
- J. ASTM B75/B75M - Standard Specification for Seamless Copper Tube 2020.
- K. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2020.
- L. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.
- M. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube 2016.
- N. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings 2016.
- O. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings 2020a.
- P. AWWA C606 - Grooved and Shouldered Joints 2015.
- Q. AWWA C651 - Disinfecting Water Mains 2014, with Addendum (2020).



- R. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications 2018.
- S. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications 2018.
- T. NSF 61 - Drinking Water System Components - Health Effects 2020.
- U. NSF 372 - Drinking Water System Components - Lead Content 2020.

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Welders' Certificates: Submit certification of welders' compliance with ASME BPVC-IX.
- D. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.
- E. Sustainable Design Documentation: For soldered copper joints, submit installer's certification that the specified installation method and materials were used.
- F. Sustainable Design Documentation: For products meeting regulatory lead-content restrictions.
- G. Project Record Documents: Record actual locations of valves.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.
- D. Welder Qualifications: Certified in accordance with ASME BPVC-IX.
- E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

#### **1.07 FIELD CONDITIONS**

- A. Do not install underground piping when bedding is wet or frozen.

### **PART 2 PRODUCTS**

#### **2.01 GENERAL REQUIREMENTS**

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

#### **2.02 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING**

- A. Cast Iron Pipe: ASTM A74 service weight.
    - 1. Fittings: Cast iron.
-



2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.

### **2.03 SANITARY SEWER PIPING, ABOVE GRADE**

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
  1. Fittings: Cast iron.
  2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

### **2.04 DOMESTIC WATER PIPING, ABOVE GRADE**

- A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
  1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  2. Joints: ASTM B32, alloy Sn95 solder.
  3. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.
    - a. Manufacturers:
      - 1) Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
      - 2) Viega LLC; [ ]: [www.viega.us/#sle](http://www.viega.us/#sle).
      - 3) Nibco Inc.; [www.nibco.com](http://www.nibco.com)
      - 4) Substitutions: See Section 01 6000 - Product Requirements.

### **2.05 FLANGES, UNIONS, AND COUPLINGS**

- A. Unions for Pipe Sizes 3 Inches and Under:
  1. Ferrous Pipe: Class 150 malleable iron threaded unions.
  2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Size Over 1 Inch:
  1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
  2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
  1. Dimensions and Testing: In accordance with AWWA C606.
  2. Housing Material: Provide ASTM A47/A47M malleable iron, ductile iron, or [ ], galvanized.
  3. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
  4. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
  5. When pipe is field grooved, provide coupling manufacturer's grooving tools.
  6. Manufacturers:
    - a. Anvil International; [ ]: [www.anvilintl.com/#sle](http://www.anvilintl.com/#sle).
    - b. Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
    - c. Grinnell Products; [ ]: [www.grinnell.com/#sle](http://www.grinnell.com/#sle).
    - d. Nibco Inc. ; [www.nibco.com](http://www.nibco.com)
    - e. Substitutions: See Section 01 6000 - Product Requirements.
- D. No-Hub Couplings:
  1. Gasket Material: Neoprene complying with ASTM C564.
  2. Band Material: Stainless steel.
  3. Eyelet Material: Stainless steel.
  4. Manufacturers:
    - a. MIFAB, Inc; [ ]: [www.mifab.com/#sle](http://www.mifab.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- E. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.



## **2.06 STRAINERS**

- A. Manufacturers:
  - 1. Armstrong International, Inc; Model [ ]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  - 2. Green Country Filter Manufacturing; Model [ ]: [www.greencountryfilter.com/#sle](http://www.greencountryfilter.com/#sle).
  - 3. Jomar Valves, a division of Jomar Group; [ ]: [www.jomarvalve.com/#sle](http://www.jomarvalve.com/#sle).
  - 4. WEAMCO; Model [ ]: [www.weamco.com/#sle](http://www.weamco.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Size 1/2 Inches to 3 Inches:
  - 1. Class 150, threaded forged bronze Y-pattern body, stainless steel perforated mesh screen with cap, and rated for 150 psi, 250 deg F WOG service.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that excavations are to required grade, dry, and not over-excavated.

### **3.02 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
  - B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
  - C. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 22 0516.
  - D. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
    - 1. See Section 22 0719.
  - E. Provide access where valves and fittings are not exposed.
    - 1. Coordinate size and location of access doors with Section 08 3100.
  - F. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
    - 1. See Section 09 9123 for painting of interior plumbing systems and components.
  - G. Install bell and spigot pipe with bell end upstream.
  - H. Install valves with stems upright or horizontal, not inverted. See Section 22 0523.
  - I. Install water piping to ASME B31.9.
  - J. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
  - K. Inserts:
    - 1. Provide inserts for placement in concrete formwork.
    - 2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
    - 3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
    - 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
    - 5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
  - L. Pipe Hangers and Supports:
    - 1. Install in accordance with ASME B31.9.
-



2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
3. Place hangers within 12 inches of each horizontal elbow.
4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
7. Provide copper plated hangers and supports for copper piping.

### **3.04 APPLICATION**

- A. Use grooved mechanical couplings and fasteners only in accessible locations.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- D. Install gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- E. Provide spring-loaded check valves on discharge of water pumps.
- F. Provide flow controls in water recirculating systems where indicated.

### **3.05 TOLERANCES**

- A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/8 inch per foot slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

### **3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM**

- A. Disinfect water distribution system in accordance with Section 33 0110.58.
- B. Prior to starting work, verify system is complete, flushed, and clean.
- C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- D. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

### **3.07 SERVICE CONNECTIONS**

- A. Provide new sanitary sewer services. Before commencing work, check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

### **3.08 SCHEDULES**

- A. Pipe Hanger Spacing:
  1. Metal Piping:
    - a. Pipe Size: 1/2 inches to 1-1/4 inches:
      - 1) Maximum Hanger Spacing: 6.5 ft.
      - 2) Hanger Rod Diameter: 3/8 inches.



- b. Pipe Size: 1-1/2 inches to 2 inches:
  - 1) Maximum Hanger Spacing: 10 ft.
  - 2) Hanger Rod Diameter: 3/8 inch.
- c. Pipe Size: 2-1/2 inches to 3 inches:
  - 1) Maximum Hanger Spacing: 10 ft.
  - 2) Hanger Rod Diameter: 1/2 inch.

**END OF SECTION**



**SECTION 22 1006  
PLUMBING PIPING SPECIALTIES**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Cleanouts.
- B. Floor Drains
- C. Miscellaneous Sewer Drainage Specialties
- D. Through penetration fire stop assemblies
- E. Water hammer arrestors.
- F. Vacuum Breakers
- G. Hose Bibbs
- H. Escutcheons

**1.03 RELATED REQUIREMENTS**

- A. Section 22 1005 - Plumbing Piping.
- B. Section 22 3000 - Plumbing Equipment.
- C. Section 22 4000 - Plumbing Fixtures.

**1.04 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASME A112.6.3 - Floor and Trench Drains 2019.
- C. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers 2017.
- D. NSF 61 - Drinking Water System Components - Health Effects 2020.
- E. NSF 372 - Drinking Water System Components - Lead Content 2020.
- F. PDI-WH 201 - Water Hammer Arresters 2017.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
- D. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.
- E. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- F. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors, [\_\_\_\_\_].

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Accept specialties on site in original factory packaging. Inspect for damage.



## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

### **2.02 ESCUTCHEONS**

- A. One-piece, Cast-brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-piece, Deep-Pattern Type: Deep-drawn, box-shaped with chrome-plated finish and spring-clip fasteners.
- C. One-piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Casting Brass Type: With polished, chrome-plated finish and with the concealed hinge and setscrew.

### **2.03 FLOOR PLATES**

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Castbrass with concealed hinge.

### **2.04 DRAINS (SEE DRAWING GEN P001 FOR SCHEDULES)**

- A. Manufacturers: Subject to compliance with requirements, available manufactures product offering that maybe incorporated into the work include, but are not limited to the following:
  - 1. Jay R. Smith Manufacturing Company; [\_\_\_\_]: [www.jrsmith.com/#sle](http://www.jrsmith.com/#sle).
  - 2. Josam Companies.
  - 3. MIFAB, Inc; [\_\_\_\_]: [www.mifab.com/#sle](http://www.mifab.com/#sle).
  - 4. Watts Water Technology, Inc.
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

### **2.05 FLOOR DRAINS (FD-A & FD-B) SEE DRAWING GEN P001 FOR SCHEDULES**

### **2.06 CLEANOUTS (FCO & WCO) SEE DRAWING GEN P001 FOR SCHEDULES**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers product offering that maybe incorporated into the work include, but are not limited to, the following:

### **2.07 HOSE BIBBS**

- A. Manufacturers:
  - 1. Jay R. Smith Manufacturing Company; [\_\_\_\_]: [www.jayrsmith.com/#sle](http://www.jayrsmith.com/#sle).
  - 2. Mifab
  - 3. Watts Regulator Company; [\_\_\_\_]: [www.wattsregulator.com/#sle](http://www.wattsregulator.com/#sle).
  - 4. Zurn Industries, LLC; [\_\_\_\_]: [www.zurn.com/#sle](http://www.zurn.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Interior Hose Bibbs:

### **2.08 WASHING MACHINE BOXES AND VALVES**

- A. Box Manufacturers:
  - 1. IPS Corporation/Water-Tite; [\_\_\_\_]: [www.ipscorp.com/#sle](http://www.ipscorp.com/#sle).
  - 2. Oatey Supply Chain Services, Inc; [\_\_\_\_]: [www.oatey.com/#sle](http://www.oatey.com/#sle).
  - 3. Viega LLC; [\_\_\_\_]: [www.viega.us/#sle](http://www.viega.us/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

### **2.09 WATER HAMMER ARRESTORS (SA-X) SEE SCHEDULE ON GENP001**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers product offering that maybe incorporated into the work include, but are not limited to, the following:
  - 1. Jay R. Smith Manufacturing Company; [\_\_\_\_]: [www.jayrsmith.com/#sle](http://www.jayrsmith.com/#sle).
  - 2. Watts Regulator Company, a part of Watts Water Technologies; [\_\_\_\_]: [www.wattsregulator.com/#sle](http://www.wattsregulator.com/#sle).



3. Zurn Industries, LLC; [ ]: [www.zurn.com/#sle](http://www.zurn.com/#sle).
  4. MIFAB, Inc; [ ]: [www.mifab.com/#sle](http://www.mifab.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Water Hammer Arrestors:
1. Stainless steel construction, piston type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.

## 2.10 FLOOR DRAIN TRAP SEALS

- A. Manufacturers:
1. Green Drains; GD4: [www.greendrains.com/#sle](http://www.greendrains.com/#sle).
  2. MIFAB, Inc; [ ]: [www.mifab.com/#sle](http://www.mifab.com/#sle).
  3. Sure Seal.
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: Push-fit EPDM or silicone fitting with a one-way membrane.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install escutcheons for piping penetration of walls, ceilings, and finished floors.
- C. Install escutcheons with ID to closely fit around the pipe, tube, and insulation and with OD that completely covers the opening.
1. Escutcheons for New Piping:
    - a. Piping with Fittings or Sleeve Protruding from Wall: One-piece, deep-pattern type.
    - b. Chrome-Plating Piping: One-piece, cast-brass type with polished, chrome-plated finish.
    - c. Insulated Piping: One-piece, stamped-steel type.
    - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
    - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
    - f. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass, cast-brass type with polished, chrome-plated finish.
    - g. Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated finish.
  2. Escutheons for Existing Pipe:
    - a. Chrome-Plated Piping: Split-casting brass type with polished, chrome-plated finish.
    - b. Insulated Piping: Split-plate, stamped-steel type with concealed or exposed-rivet hinge.
    - c. Bare Piping at Wall or Floor Penetrations in Finished Spaces: Split-casting brass type with polished, chrome-plated finish.
    - d. Bare Piping at Ceiling Penetrations in Finished Spaces: Split-casting brass type with polished chrome-plate finish.
    - e. Bare Piping in Unfinished Service Spaces: Split-casting brass type with polished, chrome-plated finish.
    - f. Bare Piping in Equipment Rooms: Split-casting brass type with polished, chrome-plated finish.
- D. Install floor plates for piping penetrations of equipment-room floors.
- E. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping with OD that completely covers opening.
1. New Piping: One-piece, floor plate type.
  2. Existing Piping: Split-casting, floor-plate type.



- F. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- G. Install floor cleanouts at elevation to accommodate finished floor.
- H. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories, sinks, mop basins, janitor sinks, urinals, & water closets.

**END OF SECTION**



**SECTION 22 3000  
PLUMBING EQUIPMENT**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Balance Valves.
- B. In-line circulator pumps.

**1.03 RELATED REQUIREMENTS**

- A. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

**1.04 REFERENCE STANDARDS**

- A. ICC (IPC) - International Plumbing Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Conduct a preinstallation meeting at least one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data:
  - 1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
  - 2. Indicate pump type, capacity, power requirements.
  - 3. Provide certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
  - 4. Provide electrical characteristics and connection requirements.
- C. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- E. Project Record Documents: Record actual locations of components.

**1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Identification: Provide pumps with manufacturer's name, model number, and rating/capacity identified by permanently attached label.
- C. Performance: Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, operate within 25 percent of midpoint of published maximum efficiency curve.

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.
-



## **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for domestic water heaters.

## **PART 2 PRODUCTS**

### **2.01 MIXING VALVES (MV-1) SEE DRAWING GEN P001 FOR SCHEDULES**

- A. Thermostatic Master Tempering Valves:
  - 1. Manufacturers: Subject to compliance requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
    - a. Leonard Valve Company; [\_\_\_\_]: [www.leonardvalve.com/#sle](http://www.leonardvalve.com/#sle).
    - b. Chicago Faucets
    - c. Powers, A Watts Brand.
    - d. Lawler Valve Co.
    - e. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Valve: Cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment.

### **2.02 BALANCE VALVES (BV-1) SEE DRAWING P001 FOR SCHEDULES**

- A. Balance Valves
  - 1. Manufacturers: Subject to compliance requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
  - 2. Tacotherm Ltd; [\_\_\_\_]: [www.tacotherm.co.uk](http://www.tacotherm.co.uk).
  - 3. Bell & Gossett.
  - 4. Circuit Setter
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Body: Lead-Free Brass.
- C. Ball: 304 Stainless Steel.
- D. Seat Rings: Glass and Carbon filled TFE.
- E. Readout Valves: Brass with EPT check valves.
- F. Stem "O" Ring: EPDM.

### **2.03 IN-LINE CIRCULATOR PUMPS (RP-1) SEE DRAWING P0001 FOR SCHEDULES**

- A. Recirculation Pumps:
  - B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
    - 1. Armstrong Fluid Technology; [\_\_\_\_]: [www.armstrongfluidtechnology.com/#sle](http://www.armstrongfluidtechnology.com/#sle).
    - 2. Bell & Gossett, a xylem brand; [\_\_\_\_]: [www.bellgossett.com/#sle](http://www.bellgossett.com/#sle).
    - 3. PACO Pumps; Grundfos Pump Corporation, USA[\_\_\_\_]. **FC**
    - 4. Substitutions: See Section 01 6000 - Product Requirements.
  - C. Casing: Bronze, rated for 125 psig working pressure, with stainless steel rotor assembly.
  - D. Impeller: Bronze.
  - E. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.
  - F. Seal: Carbon rotating against a stationary ceramic seat.
  - G. Drive: Flexible coupling.
  - H. Performance:
    - 1. Flow: 3 gpm, at 12 feet head.
    - 2. Electrical Characteristics:
-



- a. 87 Watts
- b. 120 volts, single phase, 60 Hz,

#### **2.04 ELECTRICAL WORK**

- A. Provide electrical motor driven equipment specified complete with motors, motor starters, controls, and wiring.
- B. Electrical characteristics to be as specified or indicated.
- C. Furnish motor starters complete with thermal overload protection and other appurtenances necessary for the motor control specified.
- D. Supply manual or automatic control and protective or signal devices required for the operation specified, and any control wiring required for controls and devices not shown.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions of certification, if any.
- B. Coordinate with plumbing piping and related electrical work to achieve operating system.

**END OF SECTION**



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**SECTION 22 4000  
PLUMBING FIXTURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Water closets.
- B. Urinals.
- C. Lavatories.
- D. Sinks.
- E. Service sinks.
- F. Mop sinks.
- G. Under-lavatory pipe supply covers.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 4100 - Architectural Wood Casework: Preparation of counters for sinks and lavatories.
- B. Section 07 9200 - Joint Sealants: Sealing joints between fixtures and walls and floors.
- C. Section 22 1005 - Plumbing Piping.
- D. Section 22 1006 - Plumbing Piping Specialties.
- E. Section 22 3000 - Plumbing Equipment.
- F. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use 1997 (Reaffirmed 2017).
- C. ASME A112.18.1 - Plumbing Supply Fittings 2018, with Errata.
- D. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures 2011 (Reaffirmed 2017).
- E. ASME A112.19.2 - Ceramic Plumbing Fixtures 2018, with Errata.
- F. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks 2017.
- G. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices 2020.
- H. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping 2021.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- K. NSF 61 - Drinking Water System Components - Health Effects 2020.
- L. NSF 372 - Drinking Water System Components - Lead Content 2020.
- M. UL (DIR) - Online Certifications Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
  - C. Manufacturer's Instructions: Indicate installation methods and procedures.
-



- D. Sustainable Design Documentation: Submit appropriate evidence that materials used in potable water systems comply with the specified requirements.
- E. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for electric water cooler.

### **PART 2 PRODUCTS**

#### **2.01 GENERAL REQUIREMENTS**

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Water Efficiency: EPA WaterSense label is required for all water closets, urinals, lavatory faucets, and showerheads.

#### **2.02 REGULATORY REQUIREMENTS**

- A. Comply with applicable codes for installation of plumbing systems.
- B. Comply with UL (DIR) requirements.
- C. Perform work in accordance with local health department regulations.
- D. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation.

#### **2.03 PLUMBING FIXTURES (SEE DRAWING P000 FOR SCHEDULES)**

- A. See Plumbing Plans for Plumbing Fixture Schedule
  - 1. Provide Plumbing Fixtures and all accessories as indicated on the plumbing fixture schedule on the drawings. Acceptable manufacturer are indicated below.
    - a. American Standard, Inc; [\_\_\_\_]: [www.americanstandard-us.com/#sle](http://www.americanstandard-us.com/#sle).
    - b. Delany Products; [\_\_\_\_]: [www.delanyproducts.com/#sle](http://www.delanyproducts.com/#sle).
    - c. DXV by American Standard, Inc; [\_\_\_\_]: [www.dxv.com/#sle](http://www.dxv.com/#sle).
    - d. Sloan Valve Company; [\_\_\_\_]: [www.sloanvalve.com/#sle](http://www.sloanvalve.com/#sle).
    - e. Kohler Company; [\_\_\_\_]: [www.kohler.com/#sle](http://www.kohler.com/#sle).
    - f. Viega LLC; [\_\_\_\_]: [www.viega.us/#sle](http://www.viega.us/#sle).
    - g. Zurn Industries, Inc; [\_\_\_\_]: [www.zurn.com/#sle](http://www.zurn.com/#sle).
    - h. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.04 UNDER-LAVATORY PIPE SUPPLY COVERS**

- A. Manufacturers:
    - 1. Plumberex Specialty Products, Inc; [\_\_\_\_]: [www.plumberex.com/#sle](http://www.plumberex.com/#sle).
    - 2. [\_\_\_\_].
    - 3. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Basis of Design: Plumberex Specialty Products, Inc; [www.plumberex.com/#sle](http://www.plumberex.com/#sle).
-



1. Fusion Molded Under-Lavatory Insulators (Non-Sewn): Plumberex Handy-Shield Maxx.
- C. General:
  1. Insulate exposed drainage piping including hot, cold and tempered water supplies under lavatories or sinks per ADA Standards.
  2. Construction: 1/8 inch PVC with antimicrobial, antifungal and UV resistant properties.
    - a. Provide one piece injected molded design with internal bridge at top of J-bend to prevent separating.
    - b. Comply with ASTM E84 for flame and smoke development.
    - c. Comply with ASTM C1822 Type I for covers on accessible lavatory piping.
    - d. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
    - e. Comply with ICC A117.1.
  3. Color: High gloss white.
  4. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces. No cable ties allowed.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

### **3.02 PREPARATION**

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

### **3.03 INSTALLATION**

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.
- E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

### **3.04 INTERFACE WITH WORK OF OTHER SECTIONS**

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

### **3.05 ADJUSTING**

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

### **3.06 CLEANING**

- A. Clean plumbing fixtures and equipment.
- B. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

### **3.07 PROTECTION**

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.



- C. Repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**



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**SECTION 23 0000**  
**GENERAL PROVISIONS FOR MECHANICAL WORK**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Requirements of this Section apply to work in every Section of Division 23 equally as if incorporated therein.

**1.02 WORK INCLUDED**

- A. Work included in Division 23 - Mechanical: Materials, equipment, fabrication, installation, and tests in conformity with applicable codes and authorities having jurisdiction for Mechanical Work covered by all sections within this Division.

**1.03 SCOPE**

- A. Division of the Specification into sections is for the purpose of simplification alone. Responsibility for the work of various trades shall rest with the Contractor. Various sections of this Division are related to each other as well as the mechanical drawings. Examine all drawings and read all applicable parts of the project manual in order to ensure complete execution of all work in this Division, coordinating where required with other trades in order to avoid conflicts.
  - B. These specifications and accompanying drawings are intended to cover the furnishing of all labor, materials, equipment and services necessary for the complete installation and acceptable performance of the mechanical systems. Small items of material, equipment and appurtenances not mentioned in detail or shown on the drawings, but necessary for complete and operating systems shall be provided by this contractor without additional charge to the Owner and shall be included under this contract.
  - C. In general, specifications establish the quality of material, equipment and workmanship. The contract documents are intended to secure for the Owner, a first-class installation in every respect. Labor shall be performed by skilled mechanics, and the entire facility, when delivered to the Owner, shall be ready for satisfactory and efficient operation.
  - D. The Contractor shall carefully examine the drawings and specifications before accepting the contract. He shall call attention to any changes or additions which, in his opinion, are necessary to make possible the fulfillment of any guarantee called for by these specifications; failing which, it shall be deemed that he has accepted full responsibility for all such guarantees.
  - E. The contractor shall put his work in place as fast as is reasonably possible. He shall, at all times, keep a competent foreman in charge of the work, to make decisions necessary for the diligent advancement of the work. The Contractor shall facilitate the inspection of the work by the Owner's Representative.
  - F. The Contractor shall coordinate all work in the building in order to facilitate intelligent execution of the work. He shall also remove any rubbish as expeditiously as possible.
  - G. Materials or products specified herein and/or indicated on the drawings by trade's names, manufacturer's names, model number or catalog numbers establish the quality of materials or products to be furnished. Model numbers are to be confirmed by the manufacturer to provide required capacities and material to meet the specifications and design intent. In no instance shall an obsolete, incomplete or inaccurate trade name, manufacturer name, model number or catalog number indicated on the drawings, result in additional charges to the owner.
  - H. Points of connection or continuation of work under this contract are so marked on drawings or herein specified. In case of any doubt as to the required exact location of such points, the Owner's Representative shall decide and direct.
-



- 
- I. The plumbing contractor shall provide water services to within two (2) feet of HVAC equipment requiring same, and shall terminate service with a shutoff valve. The mechanical contractor shall make the final connection to the equipment.

#### **1.04 REFERENCE STANDARDS, CODES AND REGULATIONS**

- A. Requirements of Regulatory Agencies:
1. Nothing contained in these specifications or shown on the drawings shall be construed to conflict with any State or local laws, ordinances, rules and regulations, the UL and NFPA regulations. The Contractor shall make all changes required by the enforcing authorities. Where alterations to and / or deviations from the Contract Documents are required by the authorities having jurisdiction, report the requirements to the Engineer and secure acceptance before work is started. All such changes shall be made in a manner acceptable to the Engineer and shall be made without cost to the Owner.
  2. When drawings or specifications exceed requirements of applicable laws, ordinances, rules and regulations, comply with documents establishing the more stringent requirement. All work shall be done in full conformity with the requirements of all authorities having jurisdiction. Installation shall be made in compliance with all applicable regulations, and utility company rules, all of which shall be considered a part of this specification and shall take precedence in the order of listing.
  3. It is not the intent of drawings or specifications to repeat requirements of codes except where necessary for completeness in individual sections.
- B. Published specifications, standards, tests or recommended method of trade, industry or governmental organizations as listed below apply to all work in this Division, in addition to other standards which may be specified in individual sections:
1. Associated Air Balance Council
  2. Air Diffuser Balance Council
  3. Air Moving and Conditioning Association
  4. American Gas Association
  5. American National Standards Institute
  6. Air Conditioning and Refrigeration Institute
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers
  8. American Society of Mechanical Engineers
  9. American Society for Testing and Materials
  10. Cast Iron Soil Pipe Institute
  11. ETL Testing Laboratories
  12. Factory Mutual Engineering and Research Corporation
  13. National Standard Plumbing Code
  14. National Electrical Manufacturer's Association
  15. National Fire Protection Association
  16. National Board of Fire Underwriters
  17. National Electric Code
  18. Occupational Safety and Health Administration
  19. Plumbing Drainage Institute
  20. Sheet Metal & Air Conditioning Contractors National Association
  21. Underwriters Laboratories, Inc.
- C. Furnish and file with the proper authorities, all drawings required by them in connection with the work. Contractor shall secure and obtain all approvals, permits, licenses and inspections and pay all legal and proper fees and charges in this connection, before commencing work in order to avoid delays during construction. He shall deliver the official records of the granting of the permits, etc., to the Owner's Representative.
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**1.05 QUALITY ASSURANCE**

- A. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.
- B. Supply all equipment and accessories new and free from defects.
- C. Supply all equipment and accessories in compliance with the applicable standards listed in Article 1.4 of this section with all applicable national, state and local codes.
- D. All items of a given type shall be the product of same manufacturer.

**1.06 DESCRIPTION OF BID DOCUMENTS**

- A. Specifications:
  - 1. Specifications, in general, describe quality and character of materials and equipment.
  - 2. Specifications are of simplified form and include incomplete sentences.
  - 3. Words or phrases such as "The Contractor shall", "shall be", "furnish", "provide", "a", "an", "the", and "all" may have been omitted for brevity.
- B. Drawings: Mechanical drawings under this contract are made a part of these specifications. Deviations from these specifications as noted below must have the approval of the Engineer or Construction Manager without an increase in contract price.
  - 1. The drawings shall be considered as being diagrammatic and for bidding purposes only. Intention is to show size, capacity, approximate location, direction and general relationship of one work phase to another, but not exact detail or arrangement. The attention of the contractor is called to the fact that while these drawings are generally to scale and are made as accurately as the scale will permit, all critical dimensions shall be determined in the field. They are not to be considered as erection drawings.
  - 2. The drawings do not indicate every fitting, elbow, offset, valve, etc. which is required to complete the job. Contractor shall prepare field erection drawings as required for the use of his mechanics to insure proper installation.
  - 3. Scaled and figured dimensions are approximate and are for estimating purposes only. Indicated dimensions are limiting dimensions.
  - 4. Before proceeding with work check and verify all dimensions in field.
  - 5. Assume all responsibility for fitting of materials and equipment to other parts of equipment and structure.
  - 6. Make adjustments that may be necessary or requested in order to resolve space problems, preserve headroom, and avoid architectural openings, structural members and work of other trades.
  - 7. For exact locations of building elements, refer to dimensional Architectural/Structural drawings.
- C. Description of systems: Provide all materials to provide functioning systems in compliance with performance requirements specified, and any modifications resulting from reviewed shop drawings and field coordinated drawings.
  - 1. Installation of all systems and equipment is subject to clarification as indicated in reviewed shop drawings and field coordination drawings.
- D. Do not use equipment exceeding dimensions indicated or equipment or arrangements that reduce required clearances or exceed specified maximum dimensions.
- E. If any part of Specifications or Drawings appears unclear or contradictory, apply to Architect for his interpretation and decision as early as possible, including during bidding period.
  - 1. Do not proceed with work without Engineer's decision.

**1.07 EQUIPMENT MANUFACTURERS**

- A. The first named manufacturer is used as the basis of design. Other named manufacturers are identified as equivalent manufacturers, not equivalent products. Naming other manufacturers does not necessarily imply conformance of any specific product with the written specifications.
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- B. The contractor is required to verify that equipment and material to be used on the project meets the requirements of the specifications and will physically fit the available space, clearance and service requirements of the particular piece of equipment and include all pertinent information when he submits material for acceptance. Contractor shall also be responsible for and bear the cost of any modifications to openings available or anticipated as being available for rigging equipment to its final installation place. This shall include openings in exterior envelope, walls and roofs, interior walls, corridors, passage ways or door openings. Any on site dismantling and any reassembly of equipment made necessary by impediment to the rigging of said equipment shall be the sole responsibility of the contractor.
  - C. Contract document indicates power and physical requirements based on the equipment manufacturer's data as first named. If equipment requiring more system capacity is furnished, the contractor shall be responsible for the cost associated with modifying the design and installation of associated services, including any redesign costs associated with the engineer's review.

#### 1.08 DEFINITIONS

- A. "Provide": To supply, furnish, install and connect up complete and ready safe and regular operation of particular work referred to unless specifically noted.
  - B. "Install": To erect, mount and connect complete with related accessories.
  - C. "Supply", "Furnish": To purchase, procure, acquire and deliver complete with related accessories.
  - D. "Work": Labor, materials, equipment, apparatus, controls, accessories, and other items required for proper and complete installation.
  - E. "Piping": Pipe, tube, fittings, flanges, valves, controls, strainers, hangers, supports, unions, traps, drains, insulation, and related items.
  - F. "Wiring": Raceway, fittings, wire, boxes and related items.
  - G. "Concealed": Items referred to as hidden from normal sight, embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces, or in enclosures.
  - H. "Exposed": Not installed underground or "concealed" as defined above.
  - I. "Indicated", "Shown", or "Noted": As indicated, shown or noted on drawings or specifications.
  - J. "Directed": Directed by Engineer.
  - K. "Similar" or "Equal": Of base bid manufacture, equal in materials, weight, size, design, and efficiency of specified product.
  - L. "Reviewed", "Satisfactory", or "Directed": As reviewed, satisfactory, or directed by or to Engineer.
  - M. "Motor Controllers": Manual or magnetic starters (with or without switches), individual pushbuttons or hand-off-automatic (HOA) switches controlling the operation of motors.
  - N. "Control or Actuating Devices": Automatic sensing and switching devices such as thermostats, pressure, float, electro-pneumatic switches and electrodes controlling operation of equipment.
  - O. "Remove": Dismantle, demolish and take away from the site and dispose of in accordance with all applicable rules and regulations or, should the Owner so require, deliver to a location as designated by the Owner for the use of the Owner, at no additional costs to the Owner.
  - P. "Replace": Remove existing and provide an equivalent product or material as specified.
  - Q. "Extract (and Reinstall) ": Carefully disassemble, dismantle existing, save or store where directed by the Owner, in such a manner as to preserve the existing condition and reinstall as indicated on the drawings or as described in the specifications.
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- R. Where any device or piece of equipment is referred to in the singular number, such reference shall be deemed to apply to as many devices as are required to complete the installation.

#### **1.09 JOB CONDITIONS**

- A. This contractor shall investigate all conditions affecting his work and shall provide such offsets, fittings, valves, sheet metal work, etc., as may be required to meet conditions at the building.
- B. The contractor shall verify all measurements at the building site and shall be responsible for the correctness of same before ordering materials or before starting work of any Section.
1. Report to Architect, in writing, conditions which will prevent proper provision of this work.
  2. Beginning work of any Section without reporting unsuitable conditions to Architect constitutes acceptance of conditions by Contractor.
  3. Perform any required removal, repair or replacement of this work caused by unsuitable conditions at no additional cost to Owner.
- C. Piping and ductwork shall be concealed or run behind furring in finished spaces unless otherwise noted to be run exposed.
- D. Horizontal piping and ductwork not run below slabs on grade shall be run as close as possible to underside of roof or floor slab above and parallel to building lines. Maintain maximum headroom in all areas.
- E. Determine possible interference between trades before the work is fabricated or installed. The contractor must coordinate his work to insure that erection will proceed without such interference. Coordination is of paramount importance and no request for additional payment will be considered where such request is based upon interference between trades.
- F. Connections to Existing Work:
1. Install new work and connect to existing work with minimum of interference to existing facilities.
  2. Temporary shutdowns of existing services:
  3. At no additional charges
    - a. At times not to interfere with normal operation of existing facilities.
    - b. Only with written consent of Owner.
  4. Maintain continuous operation of existing facilities as required with necessary temporary connections between new and existing work.
  5. Restore existing disturbed work to original condition.
- G. Removal, extraction and relocation of existing work.
1. The work includes demolition or removal of all construction indicated or specified. All materials resulting from demolition work, except as indicated or specified otherwise, shall become the property of the Contractor and shall be removed from the site. Rubbish and debris shall be removed from the site daily unless otherwise directed so as to not allow accumulation inside or outside the building. Materials that cannot be removed daily shall be stored in areas specified by the Owner.
  2. Title to all materials and equipment to be demolished, excepting Owner salvage and historical items, is vested in the Contractor upon receipt of notice to proceed. The Owner will not be responsible for the condition, loss or damage to such property after notice to proceed.
  3. The Owner reserves the "Right of First Refusal" on all material for salvage. Material for salvage shall be stored as approved by the Owner. Salvage materials shall be removed from the site before completion of the Contract. Material for salvage shall not be sold on the site.
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4. Property of the Owner: Salvaged items remaining the property of the Owner shall be removed in a manner to prevent damage and packed or crated to protect the items from damage while in storage or during shipment and relocated by the contractor at no cost, to the Owners designated storage facility on the site. Containers shall be properly identified as to contents.
  5. Damaged Items: Items damaged during removal or storage shall be repaired or replaced to match existing.
  6. Disconnect, remove or relocate material, equipment, plumbing fixtures, piping and other work noted and required by removal or changes in existing conditions.
  7. Where existing pipes, conduits and/or ducts which are to remain prevent installation of new work as indicated, relocate, or arrange for relocation, of existing pipes, conduits, and/or ducts.
  8. Provide new material and equipment required for relocated equipment.
  9. Plug or cap active piping or ductwork behind or below finish.
  10. Do not leave long dead-end branches.
    - a. Cap or plug as close as possible to active line.
  11. Remove unused piping, ductwork and equipment.
  12. Dispose of unusable piping, ductwork and material.

#### **1.10 CLEARANCE FROM ELECTRICAL EQUIPMENT**

- A. Piping or ductwork:
  1. Prohibited, except as noted, in:
    - a. Electric rooms and closets.
    - b. Telephone rooms and closets.
    - c. Elevator machine rooms.
    - d. Electric switchboard room.
  2. Prohibited, except as noted, over or within 5 ft. of:
    - a. Transformers.
    - b. Substations.
    - c. Switchboards.
    - d. Motor control centers.
    - e. Standby power plant.
    - f. Bus ducts.
    - g. Electrical panels.
  3. Drip pans under piping:
    - a. Only where unavoidable and approved.
    - b. 18 gauge galvanized steel.
      - 1) With bituminous paint coating.
    - c. Reinforced and supported.
    - d. Watertight.
    - e. With 1-1/4 inch drain outlet piped to floor drain or service sink.

#### **1.11 TEMPORARY FACILITIES**

- A. Temporary facilities are not included within this Section.

#### **1.12 SPECIAL TOOLS**

- A. Furnish to Owner at completion of work:
    1. One set of any special tools required to operate, adjust, dismantle or repair equipment furnished under any section of the Division.
    2. "Special tools": those not normally found in possession of mechanics or maintenance personnel.
    3. One pressure grease gun for each type of grease required.
      - a. With adapters to fit all lubricating fittings on equipment.
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- b. Include lubricant for lubricated plug valves.

### **1.13 PRODUCT DELIVERY, HANDING AND STORAGE**

- A. Provide adequate and secure storage facilities for materials and equipment during the progress of the work.
- B. Contractor shall be responsible for the condition of all materials and equipment employed in the mechanical installation until final acceptance by the Owner. Protect same from any cause whatsoever.
- C. Where necessary, ship in crated sections of size to permit passing through available space.
- D. Ship equipment in original packages, to prevent damaging or entrance of foreign matter.
- E. Handle and ship in accordance with manufacturer's recommendations.
- F. Provide protective coverings during construction.
- G. Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by Engineer.
- H. Tag all items with weatherproof tag, identifying equipment by name and purchase order number.
- I. Include packing and shipping lists.
- J. Adhere to special requirements as specified in individual sections.

### **1.14 PROTECTION OF MATERIALS**

- A. Protect from damage, water, dust, etc., material, equipment and apparatus provided under this Division, both in storage and installed, until Notice of Completion has been filed.
- B. Provide temporary storage facilities for materials and equipment.
- C. Material, equipment or apparatus damaged because of improper storage or protection will be rejected.
  - 1. Remove from site and provide new, duplicate, material, equipment, or apparatus in replacement of that rejected.
- D. Cover motors and other moving machinery to protect from dirt and water during construction. Rotate moving equipment, shafts, bearings, motors etc. to prevent corrosion and to circulate lubricants.
- E. Protect premises and work of other Divisions from damage arising out of installation of work of this Division.
  - 1. Contractor shall be responsible for the replacement of all damaged or defective work, materials or equipment. Do not install sensitive or delicate equipment until major construction work is completed.
  - 2. Remove replaced parts from premises.
- F. Make good any damage to the work caused by floods, storms, accidents, acts of God, acts of negligence, strikes, violence or theft up to time of final acceptance by the Owner.
- G. Do not leave any mechanical work in a hazardous condition, even temporarily.

### **1.15 REVIEW OF CONSTRUCTION**

- A. Work may be reviewed at any time by representative of the Engineer.
  - B. Advise Architect and Engineer that work is ready for review at following times:
    - 1. Prior to backfilling buried work.
    - 2. Prior to concealment of work in walls and above ceilings.
    - 3. When all requirements of Contract have been completed.
  - C. Neither backfill nor conceal work without Engineer's consent.
  - D. Maintain on job a set of Specifications and Drawings for use by Engineer's representatives.
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**1.16 SCHEDULE OF WORK**

- A. Arrange work to conform to schedule of construction established or required to comply with Contract Documents.
- B. In scheduling, anticipate means of installing equipment through available openings in structure.
- C. Confirm in writing to Architect and Engineer, within 30 days of signing of contract, anticipated number of days required to perform test, balance, and acceptance testing of mechanical systems.
  - 1. This phase must occur after completion of mechanical systems, including all control calibration and adjustment, and requires substantial completion of the building, including closure, ceilings, lighting, partitioning, etc.
  - 2. Submit for approval at this time, names and qualifications of test and balancing agencies to be used.
- D. Arrange with Owner schedule for work in each area.
- E. Unless otherwise directed by Owner, perform work during normal working hours.
- F. Work delays:
  - 1. In case noisy work interferes with Owner's operations, Owner may require work to be stopped and performed at some other time, or after normal working hours.

**1.17 ACCESS TO MECHANICAL WORK**

- A. Access doors in walls and ceilings.
- B. Access Units Fire-Resistance Ratings: Where fire-resistance rating is indicated for construction penetrated by access units, provide UL listed-and-labeled units, except for units which are smaller than minimum size requiring ratings as recognized by governing authority.
- C. Product Data, Access Units: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.
- D. Furnish to the general contractor all access doors necessary for access through inaccessible wall or ceiling construction, for installation by the general contractor. Information on the size and location of the subject access doors is to be communicated in writing to the general contractors during the bidding period.

**1.18 CONCRETE FOR MECHANICAL WORK**

- A. Concrete for Mechanical Work
    - 1. Basins and curbs for mechanical equipment.
    - 2. Mechanical equipment foundations and housekeeping pads.
    - 3. Inertia bases for isolation of mechanical work.
    - 4. Rough grouting in and around mechanical work.
    - 5. Patching concrete cut to accommodate mechanical work.
  - B. Quality control testing for concrete is required as work of this section.
  - C. Concrete Work Codes and Standards:
    - 1. Comply with governing regulations and, where not otherwise indicated, comply with the following industry standards; whichever is the most stringent in its application to work in each instance.
      - a. ACI 301: "Specifications for Structural Concrete for Buildings"
      - b. ACI 311: "Recommended Practice for Concrete Inspection"
      - c. ACI 318: "Building Code Requirements for Reinforced Concrete"
      - d. ACI 347R: "Recommended Practice for Concrete Form work"
      - e. ACI 304R: "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete"
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- f. Concrete Reinforcing Steel Institute's, "Manual of Standard Practice"
- D. Submittals: Shop Drawings, Mechanical Concrete Work: Submit shop drawings for structural type concrete work, showing dimensions of formed shapes of concrete; bending, placement, sizes and spacing of reinforcing steel; location of anchors, isolation units, hangers and similar devices to be integrated with concrete work; and piping penetrations, access openings, inlets and other accessories and work to be accommodated by concrete work.
- E. Laboratory Test Reports, Mechanical Concrete Work: Submit laboratory test reports for concrete work materials, and for tested samples of placed concrete (where required as work of this section).

#### **1.19 NOISE REDUCTION**

- A. Cooperate in reducing objectionable noise or vibration caused by mechanical systems.
  - 1. To extent of adjustments to specified and installed equipment and appurtenances.
- B. Correct noise problems caused by failure to install work in accordance with Contract Documents.
  - 1. Include labor and materials required as result of such failure.

#### **1.20 CUTTING AND PATCHING**

- A. Provide all carpentry, cutting and patching required for proper installation of material and equipment specified.
- B. Do not cut or drill structural members without consent of Architect.

#### **1.21 COORDINATION DRAWINGS**

- A. Layout Shop Drawings Required:
  - 1. Prepare layout shop drawings for all areas; minimum 3/8 inch scale.
  - 2. Individual coordinated trade layout drawings are to be prepared for all areas.
  - 3. General Contractor is to assure that each trade has coordinated work with other trades, prior to submittal where submittal is required.
    - a. Include stamp on each submittal indicating that layout shop drawing has been coordinated.
  - 4. No layout shop drawing will be reviewed without stamped and signed coordinated assurance by General Contractor.
  - 5. All changes shall be clearly marked on each submitted layout drawing.
  - 6. Drawings shall show work of all trades including but not limited to'
    - a. Ductwork.
    - b. Piping: All Trades.
    - c. Mechanical Equipment.
    - d. Electrical Equipment.
    - e. Main Electrical conduits and bus ducts.
    - f. Equipment supports and suspension devices.
    - g. Structural and architectural constraints.
    - h. Show location of:
      - 1) Valves
      - 2) Piping specialties
      - 3) Dampers
      - 4) Access Doors
      - 5) Control and electrical panels
      - 6) Disconnect switches
  - 7. Drawings shall indicate coordination with work in other Divisions that must be incorporated in mechanical spaces, including, but not limited to:
    - a. Elevator equipment.
    - b. Cable trays not furnished under Division 16.



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- c. Computer equipment.
  - 8. Submission of drawings:
    - a. Prepare reproducible drawings.
    - b. Submit to other trades for review of space allocated to all trades.
    - c. Revise drawings to compensate for requirements of existing conditions and conditions created by other trades.
    - d. Review revisions and other trades.
    - e. Submit one reproducible and one blueline print to Engineer for review.
  - 9. Final prepared drawings shall show that other trades affected have made reviews and signed, by each trade, at completions of coordination.
    - a. General Contractor
    - b. Include stamp on each submittal indicating that layout shop drawing has been coordinated.
  - 10. No layout shop drawing will be reviewed without stamped and signed coordination assurance by General Contractor.
- B. Shop Drawings:
- 1. Layout drawings of mechanical equipment rooms and penthouses showing all related equipment and equipment clearances required by other trades.
  - 2. Layout drawings of areas in which it may be necessary to deviate substantially from layout shown on the drawings. Minor transitions in ductwork, if required due to job conditions, need not be submitted as long as the duct area is maintained. Show major relocation of ductwork and major changes in size of ducts. Coordinate shop drawings with all trades prior to ductwork fabrication.
  - 3. Details of intermediate structural steel members required to span main structural steel for the support of ductwork.
  - 4. Method of attachment of duct hangers to building construction.
  - 5. Duct material, gage, type of joints and duct reinforcing for each size range, including sketches or SMACNA plate numbers for joints, method of fabrication and reinforcing.

## 1.22 GUARANTEE

- A. Furnish guarantee covering all work in accordance with general requirements of the contract for minimum period of one year. This personal guarantee shall exist for a period of one (1) year from the date of final acceptance of the work and shall apply to defects in materials and to defective workmanship of any kind.
  - B. For factory-assembled equipment and devices on which the manufacturers furnish standard published guarantees as regular trade practice, obtain such guarantees and replace any such equipment that proves defective during the life of these guarantees.
  - C. Guarantee all work for which materials are furnished, fabricated or field erected by the contractor, all factory-assembled equipment for which no specific manufacturer's guarantee is furnished, and all work in connection with installing manufacturer's guarantee is furnished, and all work in connection with installing manufacturer's guaranteed equipment.
  - D. In the event of failure of any work, equipment or device during the life of the guarantee, repair or replace the equipment or defective work. Remove, replace or restore, at no cost to the Owner, any part of the structure or building which may be damaged either as the direct result of the defective work or in the course of the contractor's making replacement of the defective work or materials. Work shall be done at a time and in a manner as to cause no undue inconvenience to the Owner. Provide new materials, equipment, apparatus and labor to replace that determined by Engineer to be defective or faulty.
  - E. This guarantee also applies to services including Instructions, Adjusting, Testing, Noise, Balancing, etc.
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- F. Additional equipment and material guarantees and warranties may be indicated in other sections. In all cases, the more stringent guarantee or warranty shall be provided.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS AND EQUIPMENT QUALITY**

- A. Material and equipment furnished under this Division of specification shall be new. Defective or inferior materials must be replaced by contractor at no cost to Owner regardless of the stage of construction. Inferior material shall be defined as material or equipment of a quality or performance less than that specified as determined by the Owner's Representative.
- B. Provide each item of equipment with manufacturer's identification tag which is readily accessible and clearly shows model and size.

### **2.02 ACCESS TO MECHANICAL WORK**

- A. Access Doors:
1. General: Where walls and ceilings must be penetrated for access to mechanical work, access doors shall be provided. Furnish adequate size for intended and necessary access. Furnish doors with UL Fire Rating to match wall or ceiling construction. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.
- B. Access Door Construction: Refer to Section 083113 – ACCESS DOORS AND FRAMES

## **PART 3 - EXECUTION**

### **3.01 FIELD QUALITY CONTROL**

- A. Tests:
1. Perform as specified in individual sections, and as required by authorities having jurisdiction.
  2. Duration as noted.
- B. Provide required labor, material, equipment, and connections.
- C. Furnish written report and certification those tests have been satisfactorily completed.
- D. Repair or replace defective work, as directed.
- E. Pay for restoring or replacing damaged work due to tests as directed.
- F. Pay for restoring or replacing damaged work of others, due to tests, as directed.

### **3.02 ACCESS TO MECHANICAL WORK**

- A. Coordinate installation and placement of access doors and panels with contractor for general construction.
- B. Remove or replace panels or frames that are warped, bowed, or otherwise damaged.

**END OF SECTION**



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**SECTION 23 0002**  
**MECHANICAL AND ELECTRICAL COORDINATION****PART 1 - GENERAL****1.01 WORK INCLUDED**

- A. Work Included in This Section: Materials, equipment, fabrication, installation, and tests in conformity with applicable codes and authorities having jurisdiction for the following:
  - 1. Motors.
  - 2. Factory-wired equipment (FWE).
  - 3. Factory-wired control panels (FWCP).
  - 4. Motor controllers where provided as part of mechanical equipment.
  - 5. Motor controllers where supplied under Division 23 - Mechanical Work.
  - 6. Disconnects and safety switches for mechanical equipment.
  - 7. Fuses for equipment provided, and starters and disconnect switches.
  - 8. Emergency Pushbutton Operator Station.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. Division 23 - HVAC Instrumentation and Controls, Motors.
- B. Installation and Power Wiring of Motor Controllers.

**1.03 REFERENCE STANDARDS**

- A. Published specifications standards, tests, or recommended methods of trade, industry or governmental organization as apply to work in this section where cited below:
  - 1. ANSI - American National Standards Institute.
  - 2. NEMA - National Electrical Manufacturer's Association.
  - 3. IEEE - Institute of Electrical and Electronic Engineers.

**1.04 QUALITY ASSURANCE**

- A. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.
- B. Supply all equipment and accessories new and free from defects.
- C. Supply all equipment and accessories in compliance with the applicable standards listed in Article 1.03 of this Section and with all applicable National, State and local codes.
- D. All items of a given-type shall be the products of the same manufacturer.

**1.05 DIVISION OF WORK**

- A. This section delineates the work required to be performed by Contractors under Division 23 and Division 26.

**1.06 WORK REQUIRED UNDER DIVISION 23**

- A. Furnish motors, manual and combination starters, pushbutton devices, contactors, disconnect switches, electric thermostats, low voltage transformers, Emergency Break Glass Stations and other electrical devices required for equipment furnished.
- B. Install all items in piping and ductwork such as control valves, aquastats, ductstats, etc.
- C. All external wiring of equipment, all temperature control wiring, external wiring of control circuits of magnetic starters, interlocking wiring, boiler wiring, Emergency Break Glass Stations, and mounting of control devices, etc., shall be included under Division 23. All external wiring shall be in conduit. (Unless specifically shown to be provided by the Electrical Contractor)



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- D. The Electrical Contractor, under Division 26, shall furnish and install all power wiring and conduit to junction box, to disconnect switch on unit, to motor starters and contactors, and between motor starters and contactors to motor or other load. Electrical Contractor shall be responsible for proper direction of rotation for all three phase equipment. The Electrical Contractor shall mount all starters, disconnects.
  - E. Wiring required under Division 23 shall comply with the specifications as described in Division 26.
  - F. The Plumbing Contractor, under Division 22, shall provide water and natural gas services to within two (2) feet of HVAC equipment requiring same and terminating with shut-off valves. The HVAC Contractor, under Division 23, shall make final connections to equipment.
  - G. Provide disconnect switches or safety switches for equipment. (Unless specifically shown to be provided by the Electrical Contractor, starters and disconnects shown on the electrical drawings are for installation and do not require the Electrical Contractor to furnish units)
  - H. Emergency Generator - Exhaust muffler and flexible exhaust connection shall be furnished by the generator manufacturer under Division 26. Installation of the exhaust system including providing piping, insulation and accessories shall be included under Division 23.

#### **1.07 SUBMITTALS**

- A. Shop Drawings: Complete wiring diagrams of all power and control connections (standard diagrams will not be accepted). Deliver 2 copies of approved wiring diagrams to the Electric Contractor for installation of wiring and connections required under the Electric Contract.
- B. Product Data for Motor Controllers and Disconnect Switches: Manufacturer's catalog sheets, specifications and installation instructions. Submit enclosure type coordinated for service and location. Submit simultaneously with product data required for motors. Identify each controller for use with corresponding motor. Submit shop drawings and product data in accordance with project requirements.
- C. All warranties shall be delivered as part of the close-out submission.
- D. A receipt shall be delivered as part of the close-out submission that states all required spare parts have been delivered to the owner. This receipt must be signed and dated by the owner.

### **PART 2 - PRODUCTS**

#### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Motor Controllers and Disconnects
  - 1. Square D
  - 2. Allen-Bradley
  - 3. General Electric
  - 4. Cutler-Hammer

#### **2.02 MOTOR CONTROLLERS**

- A. General: All starters shall be correctly sized to motor connected thereto. Provide one (1) additional auxiliary contact over and above that normally furnished, at least two (2) required. Provide overload heaters for each phase. Coordinate starters and controllers with the temperature control Contractor and sequence of operations.
  - B. Minimum Size: The minimum allowable size of single or three phase magnetic motor controller is NEMA size 0.
  - C. Enclosures: Unless otherwise indicated furnish NEMA 1 enclosures, except where installed outdoors furnish NEMA 3R enclosures.
  - D. Control Power: Furnish control power transformer (maximum control voltage 120 volts) mounted within each magnetic motor controller enclosure.
-



- E. Pilot Lights: Furnish pilot lights of the neon lamp type mounted in the controller enclosure, green for running, red for not running.

### **2.03 MOTOR CONTROLLER TYPES:**

- A. Type A (Full Voltage, Manual, Non-Magnetic):
1. Allen-Bradley Co. Bulletin 609 (or Bulletin 600 - single phase, 1 HP or less only).
  2. General Electric Co. CR-1062 (or CR-101 - single phase, 1 HP or less only).
  3. Cutler-Hammer. B100 (or MS - single phase, 1 HP or less only).
- B. Type A2 (2 Speed, 2 Winding, Full Voltage, Manual, Non-Magnetic):
1. Allen-Bradley Co. Bulletin 609TS (or Bulletin 600 - single phase, 1 HP or less only).
  2. General Electric Co. CR-1062 (or CR-101 - single phase, 1 HP or less only).
  3. Square D Co. Class 2512, Type M (or Class 2512, Type F - single phase, 1 HP or less only).
- C. Type B (Full Voltage Magnetic):
1. Allen-Bradley Co. Bulletin 709.
  2. General Electric Co. CR-206.
  3. Square D Co. Class 8536.
  4. Cutler-Hammer. ECN05.
- D. Type B-COM (Combination Full Voltage Magnetic/Safety Switch):
1. Allen-Bradley Co. Bulletin 712.
  2. General Electric Co. CR-208.
  3. Square D Co. Class 8538.
  4. Cutler-Hammer. ECN16.
- E. Type B2 (2 Speed, 2 Winding, Full Voltage, Magnetic):
1. Allen-Bradley Co. Bulletin 715.
  2. General Electric Co. CR209.
  3. Square D Co. Class 8810.
  4. Cutler-Hammer. ECN33.
- F. Type C (Automatic, Reduced Voltage, Magnetic):
1. Allen-Bradley Co. Bulletin 746.
  2. General Electric Co. CR-231.
  3. Square D Co. Class 8606.
  4. Cutler-Hammer. ECA42.
- G. Type C-COM (Combination Automatic, Reduced Voltage, Magnetic/ Safety Switch):
1. Allen-Bradley Co. Bulletin 746C.
  2. Square D Co. Class 8606.
  3. Cutler-Hammer. ECA43.
- H. Type D (Part Winding, Magnetic):
1. Allen-Bradley Co. Bulletin 736.
  2. General Electric Co. CR-230.
  3. Square D Co. Class 8640.
  4. Cutler-Hammer. ECA45.

### **2.04 REMOTE PUSH BUTTON STATIONS**

- A. Start-Stop with pilot light in NEMA 1 enclosure unless otherwise indicated.
1. Allen-Bradley Co. Bulletin 800S.



2. General Electric Co. CR-2943.
3. Square D Co. Class 9001.
4. Cutler-Hammer. Class 10250.

## **2.05 SAFETY SWITCHES**

- A. General Electric Co. Type TH; Square D Co. Heavy Duty Series; Cutler-Hammer HD Series; with the following:
  1. Fused switches equipped with fuseholders to accept only the fuses specified in Section 16181 (U.L. Class RK-1, RK-5, L).
  2. NEMA 1 enclosure unless otherwise indicated on drawing or required. 3R for devices installed outdoors.
  3. Switch rated 240V for 120V, 208V, 240V, circuits; 600 V for 277V, 480V circuits.
  4. Switch rated 600V for 277V, 480V circuits.
  5. Solid neutral bus when neutral or grounding conductor is included with circuit.
  6. Current rating and number of poles as indicated on drawings.

## **2.06 NAMEPLATES**

- A. Phenolic Type: Standard phenolic nameplates with 3/8" minimum size lettering engraved thereon.
- B. Embossed Aluminum: Standard stamped or embossed aluminum tags: Tech Products, Inc., Seton Name Plate Corp.

## **2.07 EMERGENCY PUSHBUTTON OPERATOR STATION**

- A. Acceptable Manufacturer: Square D or equal.
- B. Switch Style: Class 9001, NEMA 4 rated emergency mushroom head pushbutton.
- C. Voltage: 120VAC, 60Hz as required.
- D. Contacts: 20A, 2-NO/2-NC contact.
- E. Operation: Manual.
- F. Normal position: Operator out.
- G. Activated position: Operator in.
- H. Reset: Manual, turn to release.
- I. Enclosure: NEMA 4.

## **2.08 CUSTOM LEGEND PLATE**

- A. "EMERGENCY BOILER SHUTOFF"

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Equipment shall be connected in a neat and skillful manner. Equipment delivered with terminal boxes that are inadequate shall be equipped with special boxes that suit the conditions by the Mechanical Contractor furnishing the equipment.
- B. In general, rigid conduit or tubing shall be used, but equipment that requires movement or that would transmit vibration to conduit shall be wired with flexible (liquid tight) steel conduit not over 18" long.
- C. All equipment shall be grounded with a green-covered ground wire run inside the conduit and connected to equipment frame on one end and to grounding system on the other end.
- D. All electrical work required in the Mechanical Contract shall conform to the applicable requirements of Division 26 of these Specifications.



- E. The Heating, Ventilating, and Air Conditioning Contractor shall assign all Electrical Work required under his contract to the approved Automatic Temperature Control Contractor, who shall perform this work with qualified electricians employed by that Contractor.
- F. The Mechanical Contractors shall cooperate with the Contractor for Electrical Work in making all necessary tests and in receiving, storing, and setting all motor-driven equipment, electrical devices, and controls furnished and/or installed under these contracts.
- G. Install heaters correlated with full load current of motors provided.
- H. Set overload devices to suit motors provided.

### **3.02 INSTALLATION**

- A. Control Wiring:
  - 1. Provide control wiring and connections.
  - 2. Where control circuit interlocking is required between individually mounted motor controllers, provide a single pole on-off switch in a threaded type box mounted adjacent to motor safety switches which are remote from the control transformer (to enable interlock circuit to be opened when the motor safety switch is opened).
- B. Nameplates: Rivet or bolt the nameplate on the cover of NEMA 1 enclosures. Rivet or bolt and gasket the nameplate on cover of NEMA 3R or NEMA 12 enclosures. Provide phenolic or embossed aluminum nameplates as follows:
  - 1. On each remote control station, indicating motor controlled.
  - 2. On each interlock circuit switch, indicating purpose of switch.
- C. Emergency Pushbutton Operator Station: Wire all switches in series with boiler control branch circuits.

### **3.03 TYPES OF MOTOR CONTROLLERS REQUIRED FOR SINGLE SPEED MOTORS (SYSTEMS UNDER 250 VOLTS)**

- A. Single Phase Motors Less than 5 HP - Manually Operated: Type A.
- B. Single Phase Motors Less than 1/2 HP - Automatically Operated: Type A.
- C. Single Phase Motors 1/2 to 5 HP - Automatically Operated: Type B.
- D. Three Phase Squirrel Cage Motors Less than 7-1/2 HP: Type B (B-COM when indicated on drawings).
- E. Three Phase Squirrel Cage Motors 7-1/2 HP and Larger: Type C (C-COM when indicated on drawings).
- F. Three Phase Hermetically Sealed Compressor Motors Less than 7-1/2 HP: Type B.
- G. Three Phase Hermetically Sealed Compressor Motors 7-1/2 HP and Larger: Type D.

### **3.04 TYPES OF MOTOR CONTROLLERS REQUIRED FOR SINGLE SPEED MOTORS (277/480 VOLT SYSTEM)**

- A. Single Phase Motors Less than 5 HP - Manually Operated: Type A.
- B. Single Phase Motors Less than 1 HP - Automatically Operated: Type A.
- C. Single Phase Motors 1 to 5 HP - Automatically Operated: Type B.
- D. Three Phase Squirrel Cage Motors Less than 15 HP: Type B (B-COM when indicated on drawings).
- E. Three Phase Squirrel Cage Motors 15 HP and Larger: Type C (C-COM when indicated on drawings).
- F. Three Phase Hermetically Sealed Compressor Motors Less than 15 HP: Type B.



- G. Three Phase Hermetically Sealed Compressor Motors 15 HP and Larger: Type D.

**3.05 TYPES OF MOTOR CONTROLLERS REQUIRED FOR 2 SPEED MOTORS (SYSTEMS UNDER 250 VOLTS)**

- A. Single Phase Motors Less than 5 HP - Manually Operated: Type A2.
- B. Single Phase Motors Less than 1/2 HP - Automatically Operated: Type A2.
- C. Single Phase Motors 1/2 to 5 HP - Automatically Operated: Type B2.
- D. Three Phase Squirrel Cage Motors Less than 7-1/2 HP: Type B2.

**3.06 TYPES OF MOTOR CONTROLLERS REQUIRED FOR 2 SPEED MOTORS (277/480 VOLT SYSTEM)**

- A. Single Phase Motors Less than 5 HP - Manually Operated: Type A2.
- B. Single Phase Motors Less than 1 HP - Automatically Operated: Type A2.
- C. Single Phase Motors 1 to 5 HP - Automatically Operated: Type B2.
- D. Three Phase Squirrel Cage Motors Less than 15 HP: Type B2.

**3.07 DISCONNECTS**

- A. Motor Controllers: Provide safety switch for all motor controllers. Provide combination type starter-disconnect unless otherwise noted on drawings.
- B. Motors: Provide a disconnect switch for all motors. Provide a separate safety switch for motors which are not within sight of the starter.
- C. Provide safety switches for all factory packaged equipment.
- D. Provide NEMA 3R safety switch for all rooftop and outdoor equipment.
- E. Provide unit mounted disconnect switches for all equipment such as unit heaters, fans, unit ventilators, incremental units, etc

**3.08 EMERGENCY PUSHBUTTON OPERATOR STATION**

- A. Provide Emergency Pushbutton Operator Station at each boiler room exit to de-energize the primary control circuit and to close the main fuel valves to stop the flow of fuel to the burner during an emergency.
- B. Review plans for locations.
- C. Provide all conduit and wiring for interlock of each boiler.

**END OF SECTION**



**SECTION 23 0130.51**  
**HVAC AIR-DISTRIBUTION SYSTEM CLEANING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Cleaning of HVAC duct system, equipment, and related components.
- B. Testing and inspection agency employed by Owner.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 4000 - DO NOT USE BSD Quality Requirements: Additional requirements for testing and inspection agencies.
- B. Section 01 5719 - Temporary Environmental Controls.
- C. Section 01 9113 - General Commissioning Requirements: Commissioning requirements that apply to all types of work.
- D. Section 23 0800 - Commissioning of HVAC.

**1.03 PRICE AND PAYMENT PROCEDURES**

- A. See Section 01 2100 - DO NOT USE BSD Allowances, for cash, testing, and quantity allowances affecting this section.
- B. See Section 01 2200 - DO NOT USE BSD Unit Prices, for additional unit price requirements.

**1.04 DEFINITIONS**

- A. HVAC System: For purposes of this section, the surfaces to be cleaned include all interior surfaces of the heating, air-conditioning and ventilation system from the points where the air enters the system to the points where the air is discharged from the system, including the inside of air distribution equipment, coils, and condensate drain pans; see NADCA ACR for more details.
  - 1. Above-ceiling plenum for supply air is required to be cleaned.
  - 2. Above-ceiling plenum for return air is required to be cleaned.
  - 3. Makeup air system is required to be cleaned.
  - 4. Exhaust-only system is required to be cleaned.

**1.05 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- B. NADCA ACR - The NADCA Standard for Assessment, Cleaning, and Restoration of HVAC System 2021.
- C. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors current edition, including all revisions.
- D. UL 181A - Closure Systems for Use with Rigid Air Ducts Current Edition, Including All Revisions.

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Manufacturer's data sheets on each product to be used.
  - C. Qualifications Statement: Submit qualifications of proposed cleaning contractor for approval.
  - D. Qualifications Statement: Submit qualifications of proposed testing and inspection agency for approval.
  - E. Project Cleanliness Evaluation and Cleaning Plan, as specified.
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- F. Material Safety Data Sheets (MSDS): For all chemical products proposed to be used in the cleaning process; submit directly to Owner.
- G. Project Closeout Report: Include field quality control reports, evidence of satisfactory cleaning, and documentation of items needing further repair.

### **1.07 QUALITY ASSURANCE**

- A. Information Available to Contractor: No existing system documentation is available.
- B. Cleaning Contractor Qualifications: Company specializing in the cleaning and restoration of HVAC systems as specified in this section.
  - 1. Certified by one of the following:
    - a. NADCA, National Air Duct Cleaners Association: [www.nadca.com](http://www.nadca.com)
    - b. Nationally recognized certification program and organization dedicated to the cleaning of HVAC systems.
  - 2. Having minimum of three years documented experience.
  - 3. Employing for this project a supervisor certified by same organization that certified the cleaning contractor.
- C. Testing and Inspection Agency Qualifications: Experienced in inspection and testing using methods defined in NADCA ACR.
  - 1. See Section 01 4000 for additional requirements.

## **PART 2 PRODUCTS**

### **2.01 TOOLS AND EQUIPMENT**

- A. Vacuum Devices and Other Tools: Exceptionally clean, in good working order, and sealed when brought into the facility.
- B. Vacuum Devices That Exhaust Air Inside Building, Including Hand-Held and Wet Vacuums: Equipped with HEPA filtration with 99.97 percent collection efficiency for minimum 0.3-micron size particles and DOP test number.
- C. Vacuum Devices That Exhaust Air Outside Building, Including Truck- and Trailer-Mounted Types: Equipped with particulate collection including adequate filtration to contain debris removed from the HVAC system; exhausted in manner that prevents contaminant re-entry to building; compliant with applicable regulations as to outdoor environmental contamination.

### **2.02 REPLACEMENT PRODUCTS**

- A. Fibrous Glass Insulation: Provide material complying with UL 181 equivalent to existing material in quality and thickness.

### **2.03 SURFACE TREATMENTS**

- A. Anti-Microbial Materials: EPA registered specifically for use on non-porous HVAC system surfaces and applied per manufacturer's instructions.
- B. Surface Coating for Fibrous Glass Materials: Water-based, zero VOC; flame spread index less than 25, smoke developed index less than 450, Class A, when tested in accordance with ASTM E84.

## **PART 3 EXECUTION**

### **3.01 PROJECT CONDITIONS**

- A. Comply with applicable federal, state, and local requirements.
- B. Perform cleaning, inspection, and remediation in accordance with the recommendations of NADCA "Assessment, Cleaning and Restoration of HVAC Systems" (ACR) and as specified herein.
- C. Where NADCA ACR uses the terms "recommended", "highly recommended", or "ideally" in regard to a certain procedure or activity, do that unless it is clearly inapplicable to the project.



- D. Take precautions to prevent introduction of additional hazards into occupied spaces.
- E. Comply with requirements of Section 01 5719.
- F. Obtain Owner's approval of proposed temporary locations for large equipment.
- G. Designate a decontamination area and obtain Owner's approval.
- H. When portions of the facility are to remain occupied or in operation during cleaning activities, provide adequate controls or containment to prevent access to spaces being cleaned by unauthorized persons and provide detailed instructions to Owner as to these controls or containment.
- I. If unforeseen mold or other biological contamination is encountered, notify Architect/Engineer immediately, identifying areas affected and extent and type of contamination.

### **3.02 EXAMINATION**

- A. Prior to the commencement of any cleaning work, prepare and submit to Architect/Engineer a project evaluation and plan for this project, including considerations recommended in NADCA ACR.
- B. Coordinate cleaning plan with indoor air quality control plan specified in Section 01 5719.
- C. Inspect the system as required to determine appropriate methods, tools, equipment, and protection.
- D. Start of cleaning work constitutes acceptance of existing conditions.
- E. When concealed spaces are later made accessible, examine and document interior conditions prior to beginning cleaning.
- F. Document all instances of mold growth, rodent droppings, other biological hazards, and damaged system components.

### **3.03 PREPARATION**

- A. When cleaning work might adversely affect life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with authorities having jurisdiction.
- B. Ensure that electrical components that might be adversely affected by cleaning are de-energized, locked out, and protected prior to beginning work.
- C. Air-Volume Control Devices: Mark the original position of dampers and other air-directional mechanical devices inside the HVAC system prior to starting cleaning.
- D. Access to Concealed Spaces: Use existing service openings and make additional service openings as required to accomplish cleaning and inspection.
  - 1. Do not cut openings in non-HVAC components without obtaining the prior approval of Owner.
  - 2. Make new openings in HVAC components in accordance with NADCA Standard 05; do not compromise the structural integrity of the system.
  - 3. Do not cut service openings into flexible duct; disconnect at ends for cleaning and inspection.
- E. Ceiling Tile: Lay-in ceiling tile may be removed to gain access to HVAC systems during the cleaning process; protect tile from damage and reinstall upon completion; replace damaged tile.

### **3.04 CLEANING**

- A. Use any cleaning method recommended by NADCA ACR unless otherwise specified; do not use methods prohibited by NADCA ACR, or that will damage HVAC components or other work, or that will significantly alter the integrity of the system.
  - B. Obtain Owner's approval before using wet cleaning methods; ensure that drainage is adequate before beginning.
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- C. Ducts: Mechanically clean all portions of ducts.
  - D. Hoses, Cables, and Extension Rods: Clean using suitable sanitary damp wipes at the time they are being removed or withdrawn from their normal position.
  - E. Registers, Diffusers, and Grilles: When removing, take care to prevent containment exposure due to accumulated debris.
  - F. Coils: Follow NADCA ACR completely including measuring static pressure drop before and after cleaning; do not remove refrigeration coils from system to clean; report coils that are permanently impacted.
  - G. Fibrous Glass Material: Use HEPA vacuuming equipment, under constant negative pressure, do not permit to get wet, and do not damage surfaces; replace material damaged by cleaning operations.
  - H. Existing Damaged Fibrous Glass Material: Report to Architect/Engineer all evidence of damage, deterioration, delaminating, friable material, mold or fungus growth, or moisture that cannot be remedied by cleaning or resurfacing with an acceptable insulation repair coating.
    - 1. Material with active fungal growth is considered unremediable.
    - 2. Remove unremediable material and clean underlying surfaces.
    - 3. Where surface damage can be repaired by applying a coating, do so at no extra cost to Owner.
    - 4. Replacement of unremediable material is not covered by this specification.
  - I. Collect debris removed during cleaning; ensure that debris is not dispersed outside the HVAC system during the cleaning process.
  - J. Store contaminated tools and equipment in polyethylene bags until cleaned in the designated decontamination area.

### 3.05 REPAIR

- A. Repair openings cut in the ventilation system so that they do not significantly alter the airflow or adversely impact the facility's indoor air quality.
- B. At insulated ducts and components, accomplish repairs in such a manner as to achieve the equivalent thermal value.
- C. Reseal new openings in accordance with NADCA Standard 05.
- D. Reseal rigid fiber glass duct systems using closure techniques that comply with UL 181 or UL 181A.
- E. When new openings are intended to be capable of being re-opened in the future, clearly mark them and report their locations to Owner in project report documents.

### 3.06 FIELD QUALITY CONTROL

- A. Ensure that the following field quality control activities are completed prior to application of any treatments or coatings and prior to returning HVAC system to normal operation.
  - B. Visually inspect all portions of the cleaned components; if not visibly clean as defined in NADCA ACR, re-clean and reinspect.
  - C. Coils: Cleaning must restore the coil pressure drop to within 10 percent of the coil's original installed pressure drop; if original pressure drop is not known, coil will be considered clean if free of foreign matter and chemical residue based on visual inspection.
  - D. Notify Architect/Engineer when cleaned components are ready for inspection.
  - E. Notify Owner's testing and inspection agency when cleaned components are ready for inspection.
  - F. Owner reserves the right to verify cleanliness using NADCA ACR Surface Comparison Testing or NADCA Vacuum Test.
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- G. When directed, re-clean components until they pass.
- H. Contractor shall bear the costs of retesting due to inadequate cleaning.
- I. Submit evidence that all portions of the system required to be cleaned have been cleaned satisfactorily.

**3.07 ANTI-MICROBIAL TREATMENT**

- A. When directed, apply anti-microbial treatment to internal surfaces.
- B. Apply anti-microbial agent after removal of surface deposits and debris.
- C. Apply anti-microbial treatments and coatings in strict accordance with the manufacturer's written recommendations and EPA registration listing.
- D. Spray coatings directly onto interior ductwork surfaces; do not "fog" into air stream.

**3.08 ADJUSTING**

- A. After satisfactory completion of field quality control activities, restore adjustable devices to original settings, including, but not limited to, dampers, air directional devices, valves, fuses, and circuit breakers.

**3.09 WASTE MANAGEMENT**

- A. Double-bag waste and debris in 6 mil, 0.006 inch thick polyethylene plastic bags.
- B. Dispose of debris off-site in accordance with applicable federal, state and local requirements.

**END OF SECTION**



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**SECTION 23 0513**  
**COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General construction and requirements.
- B. Applications.
- C. Single phase electric motors.
- D. Three phase electric motors.
- E. Electronically Commutated Motors (ECM).

**1.02 RELATED REQUIREMENTS**

- A. Section 26 2913 - Enclosed Controllers.

**1.03 REFERENCE STANDARDS**

- A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings 2015.
- B. IEEE 112 - IEEE Standard Test Procedure for Polyphase Induction Motors and Generators 2017.
- C. NEMA MG 1 - Motors and Generators 2018.
- D. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.
- C. Manufacturer's Installation Instructions: Indicate setting, mechanical connections, lubrication, and wiring instructions.
- D. Operation Data: Include instructions for safe operating procedures.
- E. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

**1.05 QUALITY ASSURANCE**

- A. Comply with NFPA 70.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty for motors larger than 20 horsepower.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Baldor Electric Company/ABB Group: [www.baldor.com/#sle](http://www.baldor.com/#sle).
  - B. Leeson Electric Corporation: [www.leeson.com/#sle](http://www.leeson.com/#sle).
  - C. Regal-Beloit Corporation (Century): [www.centuryelectricmotor.com/#sle](http://www.centuryelectricmotor.com/#sle).
  - D. Substitutions: See Section 01 6000 - Product Requirements.
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**2.02 GENERAL CONSTRUCTION AND REQUIREMENTS**

- A. Construction:
  - 1. Open drip-proof type except where specifically noted otherwise.
  - 2. Design for continuous operation in 104 degrees F environment.
  - 3. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
- B. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
- C. Wiring Terminations:
  - 1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
  - 2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

**2.03 APPLICATIONS**

- A. Exception: Motors less than 250 watts, for intermittent service may be the equipment manufacturer's standard and need not comply with these specifications.
- B. Single phase motors for fans, blowers, and pumps: Capacitor start, capacitor run type.
- C. Motors located in exterior locations, wet air streams downstream of sprayed coil dehumidifiers, draw through cooling towers, air cooled condensers, humidifiers, direct drive axial fans, roll filters, explosion proof environments, and dust collection systems: Totally enclosed type.

**2.04 SINGLE PHASE POWER - CAPACITOR START MOTORS**

- A. Starting Torque: Three times full load torque.
- B. Starting Current: Less than five times full load current.
- C. Pull-up Torque: Up to 350 percent of full load torque.
- D. Breakdown Torque: Approximately 250 percent of full load torque.
- E. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.
- F. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve bearings.
- G. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

**2.05 THREE PHASE POWER - SQUIRREL CAGE MOTORS**

- A. Starting Torque: Between 1 and 1-1/2 times full load torque.
  - B. Starting Current: Six times full load current.
  - C. Power Output, Locked Rotor Torque, Breakdown or Pull Out Torque: NEMA Design B characteristics.
  - D. Design, Construction, Testing, and Performance: Comply with NEMA MG 1 for Design B motors.
  - E. Insulation System: NEMA Class B or better.
  - F. Testing Procedure: In accordance with IEEE 112. Load test motors to determine free from electrical or mechanical defects in compliance with performance data.
  - G. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
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- H. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid state control relay for wiring into motor starter; refer to Section 26 2913.
- I. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum ABMA STD 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- J. Sound Power Levels: To NEMA MG 1.
- K. Part Winding Start Where Indicated: Use part of winding to reduce locked rotor starting current to approximately 60 percent of full winding locked rotor current while providing approximately 50 percent of full winding locked rotor torque.
- L. Nominal Efficiency: As indicated at full load and rated voltage when tested in accordance with IEEE 112.
- M. Nominal Power Factor: As indicated at full load and rated voltage when tested in accordance with IEEE 112.

## **2.06 ELECTRONICALLY COMMUTATED MOTORS (ECM)**

- A. Applications:
  - 1. Commercial:
    - a. Roof Top Unit:
      - 1) Operating Mode: Constant speed.
      - 2) Input: Motor manufacturer to coordinate control requirements with the control board of the roof top unit and/or specified sequence of operation.
      - 3) Shaft Extension: Single.
    - b. DX Fan Coil Unit:
      - 1) Input: Motor manufacturer to coordinate control requirements with the control board of the DX fan coil unit and/or specified sequence of operation.
    - c. Power Roof Ventilator (PRV):
      - 1) Operating Mode: Constant cfm.
      - 2) Input: Motor manufacturer to coordinate control requirements with the control board of the PRV and/or specified sequence of operation.
      - 3) Shaft Extension: Single.
    - d. Energy Recovery Ventilator:
      - 1) Operating Mode: Constant cfm.
      - 2) Input: Motor manufacturer to coordinate control requirements with the control board of the energy recovery ventilator and/or specified sequence of operation.
      - 3) Shaft Extension: Single.
    - e. Hydronic Pump:
      - 1) Operating Mode: Constant speed.
      - 2) Input: Motor manufacturer to coordinate control requirements with the control board of the hydronic pump and/or specified sequence of operation.
      - 3) Flange Configuration: "C".

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

**END OF SECTION**



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**SECTION 23 0517**  
**SLEEVES AND SLEEVE SEALS FOR HVAC PIPING-CPL****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Pipe sleeves.
- B. Manufactured sleeve-seal systems.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 23 0523 - General-Duty Valves for HVAC Piping-CPL.
- C. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL: Piping identification.
- D. Section 23 0716 - HVAC Equipment Insulation-CPL.
- E. Section 23 0719 - HVAC Piping Insulation-CPL.

**1.03 REFERENCE STANDARDS**

- A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type) 2016.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

**PART 2 PRODUCTS****2.01 PIPE SLEEVES**

- A. Vertical Piping:
    - 1. Sleeve Length: 1 inch above finished floor.
    - 2. Provide sealant for watertight joint.
    - 3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.
    - 4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.
  - B. Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
  - C. Pipe Passing Through Below Grade Exterior Walls:
    - 1. Zinc coated or cast iron pipe.
-



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2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.
  - D. Pipe Passing Through Concrete Beam Flanges, except where Brass Pipe Sleeves are Specified:
    1. Galvanized steel pipe or black iron pipe with asphalt coating.
    2. Connect sleeve with floor plate except in mechanical rooms.
  - E. Pipe Passing Through Mechanical, Laundry, and Animal Room Floors above Basement:
    1. Galvanized steel pipe or black iron pipe with asphalt coating.
    2. Connect sleeve with floor plate except in mechanical rooms.
  - F. Clearances:
    1. Provide allowance for insulated piping.
    2. Wall, Floor, Floor, Partitions, and Beam Flanges: 1 inch greater than external; pipe diameter.
    3. All Rated Openings: Caulked tight with fire stopping material in compliance with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.

## **2.02 MANUFACTURED SLEEVE-SEAL SYSTEMS**

- A. Modular/Mechanical Seal:
  1. Synthetic rubber interlocking links continuously fill annular space between pipe and wall/casing opening.
  2. Provide watertight seal between pipe and wall/casing opening.
  3. Elastomer element size and material in accordance with manufacturer's recommendations.
  4. Glass reinforced plastic pressure end plates.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

### **3.02 INSTALLATION**

- A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
  - B. Install piping to conserve building space, to not interfere with use of space and other work.
  - C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
  - D. Inserts:
    1. Provide inserts for placement in concrete formwork.
    2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
    3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
    4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
    5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
  - E. Structural Considerations:
    1. Do not penetrate building structural members unless indicated.
  - F. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
    1. Underground Piping: Caulk pipe sleeve watertight with lead and oakum or mechanically expandable chloroprene inserts with bitumen sealed metal components.
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2. Aboveground Piping:
    - a. Pack solid using mineral fiber in compliance with ASTM C592.
    - b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
  3. All Rated Openings: Caulk tight with fire stopping material in compliance with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.
  4. Caulk exterior wall sleeves watertight with lead and oakum or mechanically expandable chloroprene inserts with mastic-sealed components.
- G. Manufactured Sleeve-Seal Systems:
1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
  2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
  3. Locate piping in center of sleeve or penetration.
  4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
  5. Tighten bolting for a water-tight seal.
  6. Install in accordance with manufacturer's recommendations.
- H. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

### **3.03 CLEANING**

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

**END OF SECTION**



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**SECTION 23 0519**  
**METERS AND GAUGES FOR HVAC PIPING-CPL****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Pressure gauges and pressure gauge taps.
- B. Thermometers and thermometer wells.
- C. Static pressure gauges.
- D. Filter gauges.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0993 - Sequence of Operations for HVAC Controls.
- B. Section 23 2213 - Steam and Condensate Heating Piping.

**1.03 REFERENCE STANDARDS**

- A. ASME B40.100 - Pressure Gauges and Gauge Attachments 2013.
- B. ASTM E1 - Standard Specification for ASTM Liquid-in-Glass Thermometers 2014 (Reapproved 2020).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide list that indicates use, operating range, total range and location for manufactured components.

**1.05 FIELD CONDITIONS**

- A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

**PART 2 PRODUCTS****2.01 LIQUID FLOW METERS**

- A. Manufacturers:
  - 1. Dwyer Instruments, Inc; [ ]: [www.dwyer-inst.com/#sle](http://www.dwyer-inst.com/#sle).
  - 2. McCrometer; [ ]: [www.mccrometer.com/#sle](http://www.mccrometer.com/#sle).
  - 3. Venture Measurement, a Danaher Company; [ ]: [www.venturemeasurement.com/#sle](http://www.venturemeasurement.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Calibrated ASME MFC-3M Venturi orifice plate and flanges with valved taps, chart for conversion of differential pressure readings to flow rate, with pressure gauge in case.
- C. Annular element flow stations with meter set.
  - 1. Measuring Station: Type 316 stainless steel pitot type flow element inserted through welded threaded couplet, with safety shut-off valves and quick coupling connections, and permanent metal tag indicating design flow rate, reading for design flow rate, metered fluid, line size, station or location number.
    - a. Pressure rating: 275 psi.
    - b. Maximum temperature: 400 degrees F.
    - c. Accuracy: Plus 0.55 percent to minus 2.30 percent.

**2.02 PRESSURE GAUGES**

- A. Manufacturers:
    - 1. Dwyer Instruments, Inc; [ ]: [www.dwyer-inst.com/#sle](http://www.dwyer-inst.com/#sle).
    - 2. Moeller Instrument Company, Inc; [ ]: [www.moellerinstrument.com/#sle](http://www.moellerinstrument.com/#sle).
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3. Omega Engineering, Inc; [ ]: [www.omega.com/#sle](http://www.omega.com/#sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Pressure Gauges: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background.
1. Case: Steel with brass bourdon tube.
  2. Size: 4-1/2 inch diameter.
  3. Mid-Scale Accuracy: One percent.
  4. Scale: Psi.

### 2.03 PRESSURE GAUGE TAPPINGS

- A. Gauge Cock: Tee or lever handle, brass for maximum 150 psi.
- B. Needle Valve: Brass, 1/4 inch NPT for minimum 150 psi.
- C. Pulsation Damper: Pressure snubber, brass with 1/4 inch connections.
- D. Syphon: Steel, Schedule 40, 1/4 inch angle or straight pattern.

### 2.04 STEM TYPE THERMOMETERS

- A. Manufacturers:
  1. Dwyer Instruments, Inc; [ ]: [www.dwyer-inst.com/#sle](http://www.dwyer-inst.com/#sle).
  2. Omega Engineering, Inc; [ ]: [www.omega.com/#sle](http://www.omega.com/#sle).
  3. Weksler Glass Thermometer Corp; [ ]: [www.wekslerglass.com/#sle](http://www.wekslerglass.com/#sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Thermometers - Fixed Mounting: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish.
  1. Size: 9 inch scale.
  2. Window: Clear Lexan.
  3. Stem: 4 inch brass.
  4. Calibration: Degrees F.
- C. Thermometers - Adjustable Angle: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device; adjustable 360 degrees in horizontal plane, 180 degrees in vertical plane.
  1. Size: 9 inch scale.
  2. Window: Clear Lexan.
  3. Stem: 3/4 inch NPT brass.
  4. Accuracy: 2 percent, per ASTM E77.
  5. Calibration: Degrees F.

### 2.05 THERMOMETER SUPPORTS

- A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain.
- B. Flange: 3 inch outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

### 2.06 TEST PLUGS

- A. Test Plug: 1/4 inch or 1/2 inch brass fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with neoprene core for temperatures up to 200 degrees F.

### 2.07 STATIC PRESSURE GAUGES

- A. Manufacturers:
    1. Dwyer Instruments, Inc; [ ]: [www.dwyer-inst.com/#sle](http://www.dwyer-inst.com/#sle).
    2. Omega Engineering, Inc; [ ]: [www.omega.com/#sle](http://www.omega.com/#sle).
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3. Veris Industries; [ ]: [www.veris.com/#sle](http://www.veris.com/#sle).
  4. Weksler Glass Thermometer Corp; [ ]: [www.wekslerglass.com/#sle](http://www.wekslerglass.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. 3-1/2 inch diameter dial in metal case, diaphragm actuated, black figures on white background, front recalibration adjustment, 2 percent of full scale accuracy.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Provide one pressure gauge per pump, installing taps before strainers and on suction and discharge of pump. Pipe to gauge with needle valves for isolation suction and discharge pressure.
- C. Install pressure gauges with pulsation dampers. Provide gauge cock to isolate each gauge. Provide siphon on gauges in steam systems. Extend nipples and siphons to allow clearance from insulation.
- D. Install pressure gauges on the inlet and outlet piping of all hydronic zones, hydronic coils, and heat transfer equipment.
- E. Install pressure gauges upstream and downstream of all pressure reducing valves.
- F. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Ensure sockets allow clearance from insulation.
- G. Install thermometers in air duct systems on flanges.
- H. Install thermometers in the return duct, outside air duct, inlet duct, and supply duct of all air handling systems and terminal units.
- I. Install thermometers on the inlet and outlet piping of all hydronic zones, hydronic coils, and heat transfer equipment.
- J. Locate duct mounted thermometers minimum 10 feet downstream of mixing dampers, coils, or other devices causing air turbulence.
- K. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- L. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- M. Adjust gauges and thermometers to final angle, clean windows and lenses, and calibrate to zero.
- N. Locate test plugs adjacent to pressure gauges and pressure gauge taps.

### **3.02 SCHEDULE**

- A. Positive Displacement Meters, Location:
  1. Condensate return.
  2. Expansion tank make-up.
- B. Flow Meters, Location:
  1. Condensate water system.
- C. Pressure Gauge Tappings, Location:
  1. Control valves 3/4 inch & larger - inlets and outlets.
  2. Boiler - inlets and outlets.
- D. Stem Type Thermometers, Location and Scale Range:
  1. Boilers - inlets and outlets, 0 to 400 degrees F.



- E. Thermometer Sockets, Location:
  - 1. Cabinet heaters - inlets and outlets.
  - 2. Unit heaters - inlets and outlets.
- F. Dial Thermometers, Location and Scale Range:
  - 1. Return air, 0 to 250 degrees F.
- G. Static Pressure and Filter Gauges, Location and Scale Range:
  - 1. Supply fan discharge, 0 to 15 inches W.C..

**END OF SECTION**



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**SECTION 23 0523**  
**GENERAL-DUTY VALVES FOR HVAC PIPING-CPL****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Applications.
- B. Globe valves.
- C. Ball valves.
- D. Butterfly valves.
- E. Check valves.
- F. Gate valves.
- G. Chainwheels.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL.
- C. Section 23 0716 - HVAC Equipment Insulation-CPL.
- D. Section 23 0719 - HVAC Piping Insulation-CPL.
- E. Section 23 2213 - Steam and Condensate Heating Piping.

**1.03 ABBREVIATIONS AND ACRONYMS**

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. NRS: Nonrising stem.
- E. OS&Y: Outside screw and yoke.
- F. PTFE: Polytetrafluoroethylene.
- G. RS: Rising stem.
- H. SWP: Steam working pressure.
- I. TFE: Tetrafluoroethylene.
- J. WOG: Water, oil, and gas.

**1.04 REFERENCE STANDARDS**

- A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch 2013 (Reaffirmed 2018).
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250 2020.
- C. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard 2020.
- D. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves 2017.
- E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- F. ASME B16.34 - Valves — Flanged, Threaded, and Welding End 2020.
- G. ASME B31.9 - Building Services Piping 2020.
- H. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings 2004 (Reapproved 2019).



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- I. ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service 2021.
  - J. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings 2017.
  - K. AWWA C606 - Grooved and Shouldered Joints 2015.
  - L. MSS SP-45 - Drain and Bypass Connections 2020.
  - M. MSS SP-68 - High Pressure Butterfly Valves with Offset Design 2021.
  - N. MSS SP-70 - Gray Iron Gate Valves, Flanged and Threaded Ends 2011.
  - O. MSS SP-71 - Gray Iron Swing Check Valves, Flanged and Threaded Ends 2018.
  - P. MSS SP-72 - Ball Valves with Flanged or Butt-Welding Ends for General Service 2010a.
  - Q. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves 2019.
  - R. MSS SP-85 - Gray Iron Globe and Angle Valves, Flanged and Threaded Ends 2011.
  - S. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer:
  - 1. Obtain valves for each valve type from single manufacturer.
  - 2. Company must specialize in manufacturing products specified in this section, with not less than three years of documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Prepare valves for shipping as follows:
    - 1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
    - 2. Protect valve parts exposed to piped medium against rust and corrosion.
    - 3. Protect valve piping connections such as grooves, weld ends, threads, and flange faces.
    - 4. Adjust globe, gate, and angle valves to the closed position to avoid clattering.
    - 5. Secure check valves in either the closed position or open position.
    - 6. Adjust butterfly valves to closed or partially closed position.
  - B. Use the following precautions during storage:
    - 1. Maintain valve end protection and protect flanges and specialties from dirt.
      - a. Provide temporary inlet and outlet caps.
      - b. Maintain caps in place until installation.
    - 2. Store valves in shipping containers and maintain in place until installation.
      - a. Store valves indoors in dry environment.
  - C. Exercise the following precautions for handling:
    - 1. Handle large valves with sling, modified to avoid damage to exposed parts.
    - 2. Avoid the use of operating handles or stems as rigging or lifting points.
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**PART 2 PRODUCTS****2.01 APPLICATIONS**

- A. Provide the following valves for the applications if not indicated on drawings:
  - 1. Throttling (Steam): Gate.
  - 2. Isolation (Shutoff): Butterfly and Ball.
  - 3. Swing Check (Pump Outlet):
    - a. 2 NPS and Smaller: Bronze with bronze disc.
    - b. 2-1/2 NPS and Larger: Iron with lever and weight, lever and spring, center-guided metal, or center-guided with resilient seat.
  - 4. Dead-End: Butterfly, single-flange (lug) type.
- B. Required Valve End Connections for Non-Wafer Types:
  - 1. Steel Pipe:
    - a. 2 NPS and Smaller: Threaded ends.
    - b. 2-1/2 NPS and Larger: Grooved ends or flanged.
  - 2. Copper Tube:
    - a. 2 NPS and Smaller: Threaded ends (Exception: Solder-joint valve-ends).
  - 3. Steam and Steam Condensate Pipe: Grooved ends not acceptable.
- C. Low Pressure Steam Valves (15 PSIG or Less):
  - 1. 2 NPS and Smaller, Brass and Bronze Valves:
    - a. Gate: NRS, Class 125.
    - b. Globe: Bronze disc, Class 125.
  - 2. 2-1/2 NPS and Larger, Iron Valves:
    - a. Gate: NRS, Class 125.
- D. Steam-Condensate Valves:
  - 1. 2 NPS and Smaller, Brass and Bronze Valves:
    - a. Gate: NRS, Class 125.
    - b. Swing Check: Metal seats, Class 125.
  - 2. 2-1/2 NPS and Larger, Iron Valves:
    - a. Swing Check: Metal seats, Class 125.
    - b. Gate: NRS, Class 125.

**2.02 GENERAL REQUIREMENTS**

- A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.
  - B. Valve Sizes: Match upstream piping unless otherwise indicated.
  - C. Valve Actuator Types:
    - 1. Gear Actuator: Quarter-turn valves 8 NPS and larger.
    - 2. Handwheel: Valves other than quarter-turn types.
    - 3. Hand Lever: Quarter-turn valves 6 NPS and smaller.
    - 4. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator, of size and with chain for mounting height, as indicated in the "Valve Installation" Article.
  - D. Valves in Insulated Piping: Provide 2 NPS stem extensions and the following features:
    - 1. Gate Valves: Rising stem.
    - 2. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
    - 3. Butterfly Valves: Extended neck.
    - 4. Memory Stops: Fully adjustable after insulation is installed.
  - E. Memory Stops: Fully adjustable after insulation is installed.
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- F. Valve-End Connections:
    - 1. Threaded End Valves: ASME B1.20.1.
    - 2. Flanges on Iron Valves: ASME B16.1 for flanges on iron valves.
    - 3. Pipe Flanges and Flanged Fittings 1/2 NPS through 24 NPS: ASME B16.5.
    - 4. Solder Joint Connections: ASME B16.18.
    - 5. Grooved End Connections: AWWA C606.
  - G. General ASME Compliance:
    - 1. Ferrous Valve Dimensions and Design Criteria: ASME B16.10 and ASME B16.34.
    - 2. Building Services Piping Valves: ASME B31.9.
  - H. Bronze Valves:
    - 1. Fabricate from dezincification resistant material.
    - 2. Copper alloys containing more than 15 percent zinc are not permitted.
  - I. Valve Bypass and Drain Connections: MSS SP-45.
  - J. Source Limitations: Obtain each valve type from a single manufacturer.

### **2.03 BRONZE, GLOBE VALVES**

- A. Class 125: CWP Rating: 200 psig:
  - 1. Comply with MSS SP-80, Type 1.
  - 2. Body: Bronze; ASTM B62, with integral seat and screw in bonnet.
  - 3. Ends: Threaded or solder joint.
  - 4. Stem and Disc: Bronze or PTFE.
  - 5. Packing: Asbestos free.
    - a. Handwheel: Malleable iron.

### **2.04 IRON, GLOBE VALVES**

- A. Class 125: CWP Rating: 200 psig: and Class 250: CWP Rating: 500 psig:
  - 1. Comply with MSS SP-85, Type I.
  - 2. Body: Gray iron; ASTM A126, with bolted bonnet.
  - 3. Ends: Flanged.
  - 4. Trim: Bronze.
  - 5. Packing and Gasket: Asbestos free.
  - 6. Operator: Handwheel or chainwheel.

### **2.05 BRONZE, BALL VALVES**

- A. General:
  - 1. Fabricate from dezincification resistant material.
  - 2. Copper alloys containing more than 15 percent zinc are not permitted.
- B. Two Piece, Full Port with Stainless Steel Trim:
  - 1. Comply with MSS SP-110.
  - 2. SWP Rating: 150 psig.
  - 3. CWP Rating: 600 psig.
  - 4. Body: Forged bronze or dezincified-brass alloy.
  - 5. Ends: Threaded.
  - 6. Seats: PTFE.
  - 7. Stem: Stainless steel.
  - 8. Ball: Stainless steel, vented.

### **2.06 CARBON STEEL, BALL VALVES**

- A. Class 150, Full Port, Stainless Steel Trim, Flanged:
    - 1. Comply with MSS SP-72.
    - 2. CWP Rating: 300 psig WOG.
-



3. SWP Rating: 150 psig.
4. Body: Carbon steel, ASTM A216/A216M, Type WCB.
5. Seats: PTFE.
6. Stem: Stainless steel.
7. Ball: Stainless steel, vented.

## **2.07 IRON, BALL VALVES**

- A. Split Body, Full Port:
  1. Comply with MSS SP-72.
  2. CWP Rating: 200 psig.
  3. Body: ASTM A126, gray iron.
  4. Ends: Flanged.
  5. Seats: PTFE.
  6. Stem: Stainless steel.
  7. Ball: Stainless steel.

## **2.08 HIGH-PERFORMANCE, SINGLE FLANGE BUTTERFLY VALVES**

- A. Lug type: Bi-directional dead end service without downstream flange.
  1. Comply with MSS SP-68.
  2. Class 150: CWP Rating: 285 psig and Class 300: CWP Rating: 720 psig at 100 degrees F.
  3. Body: Provide carbon steel, cast iron, ductile Iron, or stainless steel.
  4. Seat: Metal or reinforced PTFE.
  5. Offset stem: Stainless steel.
  6. Disc: Carbon steel.

## **2.09 BRONZE, SWING CHECK VALVES**

- A. Class 125: CWP Rating: 200 psig (1380 kPa) and Class 150: CWP Rating: 300 psig (2070 kPa).
  1. Comply with MSS SP-80, Type 3.
  2. Body Design: Horizontal flow.
  3. Body Material: Bronze, ASTM B62.
  4. Ends: Threaded.
  5. Disc: Bronze.

## **2.10 IRON, FLANGED END SWING CHECK VALVES**

- A. Class 125: CWP Rating: 200 psig (1380 kPa) with Metal Seats.
  1. Comply with MSS SP-71, Type I.
  2. Design: Clear or full waterway with flanged ends.
  3. Body: Gray iron with bolted bonnet in accordance with ASTM A126.
  4. Trim: Bronze.
  5. Gasket: Asbestos free.

## **2.11 BRONZE, GATE VALVES**

- A. Non-Rising Stem (NRS) or Rising Stem (RS):
  1. Comply with MSS SP-80, Type I.
  2. Class 150: CWP Rating: 300 psig.
  3. Body Material: Bronze with integral seat and union-ring bonnet.
  4. Ends: Threaded.
  5. Stem: Bronze.
  6. Disc: Solid wedge; bronze.
  7. Packing: Asbestos free.
  8. Handwheel: Malleable iron, bronze, or aluminum.



**2.12 IRON, GATE VALVES**

- A. NRS or OS&Y:
  - 1. Comply with MSS SP-70, Type I.
  - 2. Class 125: 2-1/2 NPS to 12 NPS, CWP Rating: 200 psig.
  - 3. Body Material: Gray iron with bolted bonnet.
  - 4. Ends: Flanged.
  - 5. Trim: Bronze.
  - 6. Disc: Solid wedge.
  - 7. Packing and Gasket: Asbestos free.

**2.13 CHAINWHEELS**

- A. Description: Valve actuation assembly with sprocket rim, brackets, and chain.
  - 1. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
  - 2. Attachment: For connection to ball, butterfly, and plug valve stems.
  - 3. Sprocket Rim with Chain Guides: Ductile iron include zinc coating.
  - 4. Chain: Hot-dip galvanized steel. Sized to fit sprocket rim.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Discard all packing materials and verify that valve interior, including threads and flanges, are completely clean without signs of damage or degradation that could result in leakage.
- B. Verify valve parts to be fully operational in all positions from closed to fully open.
- C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.
- D. Should valve is determined to be defective, replace with new valve.

**3.02 INSTALLATION**

- A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.
- B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.
- C. Install check valves where necessary to maintain direction of flow as follows:
  - 1. Swing Check: Install horizontal maintaining hinge pin level.
- D. Provide chainwheels on operators for valves 4 NPS and larger where located 96 NPS or more above finished floor, terminating 60 NPS above finished floor.

**END OF SECTION**



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**SECTION 23 0529**  
**HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Support and attachment components for equipment, piping, and other HVAC/hydronic work.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 05 5000 - Metal Fabrications: Materials and requirements for fabricated metal supports.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General - Purpose Piping 2014 (Reapproved 2020).
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings 1999, with Editorial Revision (2018).
- F. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.
- I. MFMA-4 - Metal Framing Standards Publication 2004.
- J. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).
- K. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
  2. Coordinate the work with other trades to provide additional framing and materials required for installation.
  3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
  4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
  5. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.
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**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.
- C. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.
  - 1. Application of protective inserts, saddles, and shields at pipe hangers for each type of insulation and hanger.
- D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

**1.06 QUALITY ASSURANCE**

- A. Comply with applicable building code.
- B. Installer Qualifications for Field-Welding: As specified in Section 05 5000.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

**PART 2 PRODUCTS****2.01 SUPPORT AND ATTACHMENT COMPONENTS**

- A. General Requirements:
  - 1. Comply with MSS SP-58.
  - 2. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.
  - 3. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
  - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 4.0. Include consideration for vibration, equipment operation, and shock loads where applicable.
  - 5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
  - 6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
    - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
    - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
    - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
    - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Materials for Metal Fabricated Supports: Comply with Section 05 5000.
- C. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
  - 1. Manufacturers:



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- a. Cooper B-Line, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
      - b. Ferguson Enterprises Inc: [www.fnw.com/#sle](http://www.fnw.com/#sle).
      - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
      - d. Unistrut, a brand of Atkore International Inc: [www.unistrut.com/#sle](http://www.unistrut.com/#sle).
    2. Provide factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
    3. Comply with MFMA-4.
    4. Channel Material:
      - a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
      - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
    5. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
    6. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
  - D. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
    1. Minimum Size, Unless Otherwise Indicated or Required:
      - a. Equipment Supports: 1/2 inch diameter.
      - b. Piping up to 1 inch (27 mm) nominal: 1/4 inch diameter.
      - c. Piping larger than 1 inch (27 mm) nominal: 3/8 inch diameter.
      - d. Trapeze Support for Multiple Pipes: 3/8 inch diameter.
  - E. Thermal Insulated Pipe Supports:
    1. Manufacturers:
      - a. Buckaroos, Inc: [www.buckaroos.com/#sle](http://www.buckaroos.com/#sle).
      - b. KB Enterprises: [www.snappitz.com/#sle](http://www.snappitz.com/#sle).
    2. General Construction and Requirements:
      - a. Insulated pipe supports to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
      - b. Surface Burning Characteristics: Flame spread index/smoke developed index of 5/30, maximum, when tested in accordance with ASTM E84 or UL 723.
      - c. Pipe supports to be provided for nominally sized, 1/2 inch to 30 inch iron pipes.
      - d. Insulation inserts to consist of rigid phenolic foam insulation surrounded by a 360 degree, PVC jacketing.
    3. PVC Jacket:
      - a. Pipe insulation protection shields to be provided with a ball bearing hinge and locking seam.
      - b. Minimum Service Temperature: Minus 40 degrees F.
      - c. Maximum Service Temperature: 180 degrees F.
      - d. Moisture Vapor Transmission: 0.0071 perm inch, when tested in accordance with ASTM E96/E96M.
      - e. Thickness: 60 mil.
      - f. Connections: Brush on welding adhesive.
    4. Pipe insulation protection shields to be provided at the hanger points and guide locations on pipes requiring insulation as indicated on drawings.
    5. Products:
      - a. Buckaroos, Inc; CoolDry: [www.buckaroos.com/#sle](http://www.buckaroos.com/#sle).
  - F. Pipe Supports:
    1. Liquid Temperatures Up To 122 degrees F:
      - a. Overhead Support: MSS SP-58 Types 1, 3 through 12.
      - b. Support From Below: MSS SP-58 Types 35 through 38.
    2. Operating Temperatures from 122 to 446 degrees F:
      - a. Overhead Support: MSS SP-58 Type 1 or 3 through 12, with appropriate saddle of MSS SP-58 Type 40 for insulated pipe.
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- b. Roller Support: MSS SP-58 Types 41 or 43 through 46, with appropriate saddle of MSS SP-58 Type 39 for insulated pipe.
    - c. Sliding Support: MSS SP-58 Types 35 through 38.
  - G. Pipe Stanchions: For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.
    - 1. Manufacturers:
      - a. Anvil International; H-Block: [www.anvilintl.com/#sle](http://www.anvilintl.com/#sle).
    - 2. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
    - 3. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.
  - H. Beam Clamps: MSS SP-58 Types 19 through 23, 25 or 27 through 30 based on required load.
    - 1. Manufacturers:
      - a. Ferguson Enterprises Inc: [www.fnw.com/#sle](http://www.fnw.com/#sle).
    - 2. Material: ASTM A36/A36M carbon steel or ASTM A181/A181M forged steel.
    - 3. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
  - I. Riser Clamps:
    - 1. Manufacturers:
      - a. Ferguson Enterprises Inc; [ ]: [www.fnw.com/#sle](http://www.fnw.com/#sle).
    - 2. Provide copper plated clamps for copper tubing support.
    - 3. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
  - J. Offset Pipe Clamps: Double-leg design two-piece pipe clamp.
  - K. Strut Clamps: Two-piece pipe clamp.
  - L. Insulation Clamps: Two bolt-type clamps designed for installation under insulation.
  - M. Pipe Hangers: For a given pipe run, use hangers of the same type and material.
    - 1. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
    - 2. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.
  - N. Intermediate Pipe Guides: Use pipe clamps with oversize pipe sleeve that provides clearance around pipe.
    - 1. Pipe Diameter 6 inches and Smaller: Provide minimum clearance of 0.16 inch.
    - 2. Pipe Diameter 8 inches: Provide U-bolts with double nuts providing minimum clearance of 0.28 inch.
    - 3. Pipe Diameter 8 inches: 0.625 inch U-bolt.
    - 4. Pipe Diameter 10 inches: 0.75 inch U-bolt.
    - 5. Pipe Diameter 12 to 16 inches: 0.875 inch U-bolt.
    - 6. Pipe Diameter 18 to 30 inches: 1 inch U-bolt.
  - O. Pipe Alignment Guides: Galvanized steel.
    - 1. Pipe Diameter 8 inches and Smaller: Spider or sleeve type.
    - 2. Pipe Diameter 10 inches and Larger: Roller type.
  - P. Dielectric Barriers: Provide between metallic supports and metallic piping and associated items of dissimilar type; acceptable dielectric barriers include rubber or plastic sheets or coatings attached securely to pipe or item.
  - Q. Nonpenetrating Rooftop Supports for Low-Slope Roofs:
    - 1. Manufacturers:
      - a. Anvil International; H-Block: [www.anvilintl.com/#sle](http://www.anvilintl.com/#sle).
      - b. Cooper B-Line, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
      - c. Erico International Corporation, a brand of Pentair: [www.erico.com/#sle](http://www.erico.com/#sle).
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- d. Ferguson Enterprises Inc: [www.fnw.com/#sle](http://www.fnw.com/#sle).
  - e. PHP Systems/Design: [www.phpsd.com/#sle](http://www.phpsd.com/#sle).
  - f. Unistrut, a brand of Atkore International Inc: [www.unistrut.com/#sle](http://www.unistrut.com/#sle).
  - 2. Provide steel pedestals with thermoplastic or rubber base that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified.
  - 3. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
  - 4. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
  - 5. Mounting Height: Provide minimum clearance of 6 inches under supported component to top of roofing.
- R. Pipe Shields for Insulated Piping:
- 1. Manufacturers:
    - a. Anvil International: [www.anvilintl.com/#sle](http://www.anvilintl.com/#sle).
  - 2. General Construction and Requirements:
    - a. Surface Burning Characteristics: Comply with ASTM E84 or UL 723.
    - b. Shields Material: UV-resistant polypropylene with glass fill.
    - c. Maximum Insulated Pipe Outer Diameter: 12-5/8 inch.
    - d. Minimum Service Temperature: Minus 40 degrees F.
    - e. Maximum Service Temperature: 178 degrees F.
    - f. Pipe shields to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
- S. Anchors and Fasteners:
- 1. Manufacturers - Mechanical Anchors:
    - a. Hilti, Inc: [www.us.hilti.com/#sle](http://www.us.hilti.com/#sle).
    - b. ITW Red Head, a division of Illinois Tool Works, Inc: [www.itwredhead.com/#sle](http://www.itwredhead.com/#sle).
    - c. Powers Fasteners, Inc: [www.powers.com/#sle](http://www.powers.com/#sle).
    - d. Simpson Strong-Tie Company Inc: [www.strongtie.com/#sle](http://www.strongtie.com/#sle).
  - 2. Manufacturers - Powder-Actuated Fastening Systems:
    - a. Hilti, Inc: [www.us.hilti.com/#sle](http://www.us.hilti.com/#sle).
    - b. ITW Ramset, a division of Illinois Tool Works, Inc: [www.ramset.com/#sle](http://www.ramset.com/#sle).
    - c. Powers Fasteners, Inc: [www.powers.com/#sle](http://www.powers.com/#sle).
    - d. Simpson Strong-Tie Company Inc: [www.strongtie.com/#sle](http://www.strongtie.com/#sle).
  - 3. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
  - 4. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
  - 5. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
  - 6. Hollow Masonry: Use toggle bolts.
  - 7. Hollow Stud Walls: Use toggle bolts.
  - 8. Steel: Use beam clamps, machine bolts, or welded threaded studs.
  - 9. Sheet Metal: Use sheet metal screws.
  - 10. Wood: Use wood screws.
  - 11. Plastic and lead anchors are not permitted.
  - 12. Hammer-driven anchors and fasteners are not permitted.
  - 13. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
    - a. Comply with MFMA-4.
    - b. Channel Material: Use galvanized steel.
    - c. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch minimum base metal thickness.
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- d. Manufacturer: Same as manufacturer of metal channel (strut) framing system.
  - 14. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
  - T. Pipe Installation Accessories:
    - 1. Copper Pipe Supports:
      - a. Manufacturers:
        - 1) HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - 2. Thermal Insulated Pipe Supports:
      - a. Manufacturers:
        - 1) HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - 3. Overhead Pipe Supports:
      - a. Manufacturers:
        - 1) HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - 4. Plenum Pipe Supports:
      - a. Manufacturers:
        - 1) HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - 5. Telescoping Pipe Supports:
      - a. Manufacturers:
        - 1) HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - 6. Inserts and Clamps:
      - a. Manufacturers:
        - 1) HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).

## **2.02 RETROFIT PIPING COVER SYSTEM**

- A. Manufacturers:
  - 1. DecoShield Systems, Inc: [www.decoshield.com/#sle](http://www.decoshield.com/#sle).
- B. General Requirements:
  - 1. Surface Burning Characteristics: Flame spread index/smoke developed index of 20/250, maximum, when tested in accordance with ASTM E84 or UL 723.
- C. Materials:
  - 1. Piping Cover System: Removal-resistant, modular, snap-fit cover units, clips, and anchors for use with CPVC, steel, and copper piping systems.
  - 2. Cover Units: L-shaped and U-shaped cross-section units of flame retardant resin material, paintable finish.
  - 3. Unit Length: 7.5 feet.
  - 4. Provide coupling fittings for joining units end to end and prefabricated inside and outside corner fittings and end caps as required.
  - 5. Provide mounting clips to secure covers to wall-ceiling per manufacturer requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
  - B. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
  - C. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
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- D. Unless specifically indicated or approved by Architect/Engineer, do not provide support from suspended ceiling support system or ceiling grid.
  - E. Unless specifically indicated or approved by Architect/Engineer, do not provide support from roof deck.
  - F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
  - G. Field-Welding (where approved by Architect/Engineer): Comply with Section 05 5000.
  - H. Provide thermal insulated pipe supports complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.
  - I. Equipment Support and Attachment:
    - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
    - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
    - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
    - 4. Unless otherwise indicated, mount floor-mounted equipment on properly sized 3 inch high concrete pad constructed in accordance with Section 03 3000.
    - 5. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
  - J. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.
  - K. Secure fasteners according to manufacturer's recommended torque settings.
  - L. Remove temporary supports.

### **3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

### **END OF SECTION**



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**SECTION 23 0550  
WIND RESTRAINT FOR HVAC SYSTEMS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

**1.02 SECTION INCLUDES**

- A. Support and brace mechanical and electrical systems, as called for, to resist directional wind forces (lateral, longitudinal and vertical).

**1.03 APPLICABLE CODES AND STANDARDS**

- A. Provide work in compliance with the following codes and standards:
- B. 2015 International Building Code (Section 1609).
- C. 2015 International Mechanical Code (Section 301, Item 301.15).
- D. American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures with Supplement No. 1 - Standard ASCE/SEI 7-10.

**1.04 QUALITY ASSURANCE**

- A. General:
  - 1. The contractor shall provide professional engineer stamped and signed calculations, and details of wind restraint systems to meet total design lateral force requirements for support and restraint of mechanical and electrical systems.
  - 2. Systems requiring wind restraint including, but not limited to:
    - a. Exhaust fans.
    - b. Hooded intake or relief ventilators.
    - c. Ductwork.
    - d. Rooftop air handling equipment.
    - e. Condensing units.
    - f. Miscellaneous HVAC equipment.
    - g. Roof curbs and pipe/duct/equipment supports associated with any of the equipment listed above.

**1.05 SUBMITTALS**

- A. Submit wind force level (Fp) calculations from applicable building code. Submit pre-approved restraint selections, installation details, and plans indicating locations of restraints.
- B. Calculations, plans, restraint selection, and installation details shall be stamped and signed by a professionally licensed engineer experienced in wind restraint design.
- C. Submit manufacturer's product data.
- D. For each piece of equipment that requires wind restraint as outlined in this section, include the following:
  - 1. Dimensioned Outline Drawings of Equipment Unit: Identify the center of gravity and locate and describe mounting and anchoring provisions.
  - 2. Anchorage: Provide detailed description of equipment anchorage devices on which the calculations are based and their installation requirements. Identify anchor bolts, studs and other mounting devices. Provide information on the size, type and spacing of mounting brackets, holes and other provisions.



## **PART 1 PRODUCTS**

### **2.01 CODE INFORMATION**

- A. This project is subject to the wind bracing requirements of the 2015 International Building Code (Section 1609) and American Society of Civil Engineers ASCE/SEI 7-10. The following criteria are applicable to this project:
  - 1. Nominal Design Wind Speed (V) (Per ASCE 7-10): 120 mph.
  - 2. Risk Category (Per ASCE 7-10): III
  - 3. Exposure Category (Per ASCE 7-10): C
  - 4. Height and Exposure Adjustment Coefficient (Per ASCE 7-10): 1.21

### **2.02 WIND BRACING AND SUPPORT OF SYSTEMS AND COMPONENTS**

- A. General:
  - 1. Design analysis shall include calculated dead loads, wind loads, and capacity of materials utilized for the connection of the equipment or system to the structure.
  - 2. Analysis shall detail anchoring methods, bolt diameter, and embedment depth.
  - 3. All wind restraint devices shall be designed to accept without failure the forces calculated per the applicable building code and as summarized in Section 2.1.
- B. Friction from gravity loads shall not be considered resistance to wind forces.

## **PART 1 EXECUTION**

### **3.01 INSTALLATION**

- A. Wind Restraint of Ductwork and Equipment:
  - 1. All restraint systems shall be installed in strict accordance with the manufacturer's restraint guidelines and all certified submittal data.
  - 2. The interaction between mechanical and electrical equipment and the supporting structures shall be designed into the restraint systems.
  - 3. Friction clips shall not be used for anchorage attachments.
  - 4. Expansion anchors shall not be used for non-vibration isolated equipment rated over 10 HP.
  - 5. Components mounted on vibration isolation systems shall have a bumper restraint or snubber in each horizontal direction and vertical restraints shall be provided to resist overturning.
  - 6. Installation of restraints shall not cause any change in position of equipment or ductwork, resulting in stresses or misalignment.
  - 7. Exhaust fans with hinge kits shall have wind restraint fasteners installed on the hinged side, same as the three (3) non-hinged sides.
  - 8. No rigid connections between equipment and the building structure shall be made that degrade the noise and vibration-isolation system specified.
  - 9. Do not install any equipment or duct that makes rigid connections with the building unless isolation is not specified.
  - 10. Prior to installation, bring to the Architect's/Engineer's attention any discrepancies between the specifications and the field conditions, or changes required due to specific equipment selection.
  - 11. Bracing may occur from flanges of structural beams, upper truss cords of bar joists, cast in place inserts, or wedge-type concrete anchors. Consult Structural Engineer of record.
  - 12. Overstressing of the building structure shall not occur from overhead support of equipment. Bracing attached to structural members may present additional stresses. The Contractor shall submit loads to the Structural Engineer of record for approval in this event.
  - 13. Brace support rods when necessary to accept compressive loads. Welding of compressive braces to the vertical support rods is not acceptable.
  - 14. Provide reinforced clevis bolts where required.



15. Do not brace a system to two independent structures such as a roof and wall.

**END OF SECTION**



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**SECTION 23 0553**  
**IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Adhesive-backed duct markers.
- D. Stencils.
- E. Pipe markers.
- F. Ceiling tacks.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 9123 - Interior Painting: Identification painting.

**1.03 REFERENCE STANDARDS**

- A. ASTM D709 - Standard Specification for Laminated Thermosetting Materials 2017.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
- C. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- D. Product Data: Provide manufacturers catalog literature for each product required.
- E. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
- F. Project Record Documents: Record actual locations of tagged valves.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION APPLICATIONS**

- A. Air Handling Units: Nameplates.
  - B. Air Terminal Units: Tags.
  - C. Automatic Controls: Tags. Key to control schematic.
  - D. Control Panels: Nameplates.
  - E. Dampers: Ceiling tacks, where located above lay-in ceiling.
  - F. Ductwork: Adhesive-backed duct markers or stencils.
  - G. Heat Transfer Equipment: Nameplates.
  - H. Instrumentation: Tags.
  - I. Major Control Components: Nameplates.
  - J. Piping: Pipe markers.
  - K. Pumps: Nameplates.
  - L. Relays: Tags.
  - M. Small-sized Equipment: Tags.
  - N. Tanks: Nameplates.
  - O. Thermostats: Nameplates.
  - P. Valves: Tags and ceiling tacks where located above lay-in ceiling.
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Q. Water Treatment Devices: Nameplates.

## **2.02 NAMEPLATES**

- A. Manufacturers:
  - 1. Advanced Graphic Engraving, LLC: [www.advancedgraphicengraving.com/#sle](http://www.advancedgraphicengraving.com/#sle).
  - 2. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 3. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 4. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 5. Seton Identification Products, a Tricor Direct Company: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Letter Color: White.
- C. Letter Height: 1/4 inch.
- D. Background Color: Black.
- E. Plastic: Comply with ASTM D709.

## **2.03 TAGS**

- A. Manufacturers:
  - 1. Advanced Graphic Engraving: [www.advancedgraphicengraving.com/#sle](http://www.advancedgraphicengraving.com/#sle).
  - 2. Brady Corporation: [www.bradycorp.com/#sle](http://www.bradycorp.com/#sle).
  - 3. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 4. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 5. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  - 6. Seton Identification Products, a Tricor Company: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- C. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
- D. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

## **2.04 ADHESIVE-BACKED DUCT MARKERS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  - 2. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  - 3. Seton Identification Products, a Tricor Company: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.
- C. Style: Individual Label.
- D. Color: Green/White Green/White.

## **2.05 STENCILS**

- A. Manufacturers:
    - 1. Brady Corporation: [www.bradycorp.com/#sle](http://www.bradycorp.com/#sle).
    - 2. Craftmark Pipe Markers: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
    - 3. Insite Solutions, LLC: [www.stop-painting.com/#sle](http://www.stop-painting.com/#sle).
    - 4. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
    - 5. Seton Identification Products, a Tricor Company: [www.seton.com/#sle](http://www.seton.com/#sle).
  - B. Stencils: With clean cut symbols and letters of following size:
    - 1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
    - 2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
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3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
  4. 8 to 10 inch Outside Diameter of Insulation or Pipe: 24 inch long color field, 2-1/2 inch high letters.
  5. Over 10 inch Outside Diameter of Insulation or Pipe: 32 inch long color field, 3-1/2 inch high letters.
  6. Ductwork and Equipment: 2-1/2 inch high letters.
- C. Stencil Paint: As specified in Section 09 9123, semi-gloss enamel, colors complying with ASME A13.1.

## 2.06 PIPE MARKERS

- A. Manufacturers:
1. Brady Corporation; [ ]: [www.bradycorp.com/#sle](http://www.bradycorp.com/#sle).
  2. Brimar Industries, Inc; [ ]: [www.pipemarker.com/#sle](http://www.pipemarker.com/#sle).
  3. Craftmark Pipe Markers; [ ]: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
  4. Kolbi Pipe Marker Co; [ ]: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
  5. Seton Identification Products, a Tricor Company; [ ]: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Color: Comply with ASME A13.1.
- C. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- E. Color code as follows:
1. Heating, Cooling, and Boiler Feedwater: Green with white letters.

## 2.07 CEILING TACKS

- A. Manufacturers:
1. Craftmark Pipe Markers; [ ]: [www.craftmarkid.com/#sle](http://www.craftmarkid.com/#sle).
- B. Description: Steel with 3/4 inch diameter color coded head.
- C. Color code as follows:
1. HVAC Equipment: Yellow.
  2. Fire Dampers and Smoke Dampers: Red.
  3. Heating/Cooling Valves: Blue.

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Section 09 9123 for stencil painting.

### 3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Apply stencil painting in accordance with Section 09 9123.
- D. Install plastic pipe markers in accordance with manufacturer's instructions.
- E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- F. Use tags on piping 3/4 inch diameter and smaller.



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1. Identify service, flow direction, and pressure.
  2. Install in clear view and align with axis of piping.
  3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- G. Install ductwork with adhesive-backed duct markers. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
- H. Locate ceiling tacks to locate dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

**END OF SECTION**



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**SECTION 23 0593**  
**TESTING, ADJUSTING, AND BALANCING FOR HVAC-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Testing, adjustment, and balancing of air systems.
- B. Testing, adjustment, and balancing of hydronic, steam, and refrigerating systems.
- C. Measurement of final operating condition of HVAC systems.
- D. Commissioning activities.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 9113 - General Commissioning Requirements: Commissioning requirements that apply to all types of work.
- B. Section 23 0800 - Commissioning of HVAC.

**1.03 REFERENCE STANDARDS**

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems 2008, with Errata (2019).
- C. NEBB (TAB) - Procedural Standards for Testing Adjusting and Balancing of Environmental Systems 2015, with Errata (2017).
- D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing 2002.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Installer Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.
  - C. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
    - 1. Submit to Architect/Engineer.
    - 2. Include at least the following in the plan:
      - a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
      - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
      - c. Identification and types of measurement instruments to be used and their most recent calibration date.
      - d. Final test report forms to be used.
      - e. Procedures for formal deficiency reports, including scope, frequency and distribution.
  - D. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
    - 1. Revise TAB plan to reflect actual procedures and submit as part of final report.
    - 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect/Engineer and for inclusion in operating and maintenance manuals.
    - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
    - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
    - 5. Units of Measure: Report data in I-P (inch-pound) units only.
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6. Include the following on the title page of each report:
    - a. Name of Testing, Adjusting, and Balancing Agency.
    - b. Address of Testing, Adjusting, and Balancing Agency.
    - c. Telephone number of Testing, Adjusting, and Balancing Agency.
    - d. Project name.
    - e. Project location.
    - f. Project Architect/Engineer.
    - g. Project Engineer.
    - h. Project Contractor.
    - i. Report date.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 GENERAL REQUIREMENTS**

- A. Perform total system balance in accordance with one of the following:
  1. AABC (NSTSB), AABC National Standards for Total System Balance.
  2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
  3. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
  1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
  2. Certified by one of the following:
    - a. AABC, Associated Air Balance Council: [www.aabc.com/#sle](http://www.aabc.com/#sle); upon completion submit AABC National Performance Guaranty.
    - b. NEBB, National Environmental Balancing Bureau: [www.nebb.org/#sle](http://www.nebb.org/#sle).
    - c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: [www.tabbcertified.org/#sle](http://www.tabbcertified.org/#sle).
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

### **3.02 EXAMINATION**

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
    1. Systems are started and operating in a safe and normal condition.
    2. Temperature control systems are installed complete and operable.
    3. Final filters are clean and in place. If required, install temporary media in addition to final filters.
    4. Duct systems are clean of debris.
    5. Fans are rotating correctly.
    6. Fire and volume dampers are in place and open.
    7. Air coil fins are cleaned and combed.
    8. Access doors are closed and duct end caps are in place.
    9. Air outlets are installed and connected.
    10. Duct system leakage is minimized.
    11. Hydronic systems are flushed, filled, and vented.
    12. Pumps are rotating correctly.
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- 13. Service and balance valves are open.
- B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
- C. Beginning of work means acceptance of existing conditions.

### **3.03 PREPARATION**

- A. Provide instruments required for testing, adjusting, and balancing operations.
- B. Provide additional balancing devices as required.

### **3.04 ADJUSTMENT TOLERANCES**

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

### **3.05 RECORDING AND ADJUSTING**

- A. Field Logs: Maintain written logs including:
  - 1. Running log of events and issues.
  - 2. Discrepancies, deficient or uncompleted work by others.
  - 3. Contract interpretation requests.
  - 4. Lists of completed tests.
- B. Ensure recorded data represents actual measured or observed conditions.
- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- F. Check and adjust systems approximately six months after final acceptance and submit report.

### **3.06 AIR SYSTEM PROCEDURE**

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- E. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- F. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- G. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- H. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.



- I. Where modulating dampers are provided, take measurements and balance at extreme conditions.

### **3.07 WATER SYSTEM PROCEDURE**

- A. Adjust water systems to provide required or design quantities.
- B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

### **3.08 COMMISSIONING**

- A. See Sections 01 9113 - General Commissioning Requirements and 23 0800 for additional requirements.
  - B. Perform prerequisites prior to starting commissioning activities.
  - C. Fill out Prefunctional Checklists for:
    - 1. Air side systems.
    - 2. Water side systems.
  - D. Furnish to the Commissioning Authority, upon request, any data gathered but not shown in the final TAB report.
  - E. Re-check minimum outdoor air intake flows and maximum and intermediate total airflow rates for [ ] percent of the air handlers plus a random sample equivalent to [ ] percent of the final TAB report data as directed by Commissioning Authority.
    - 1. Original TAB agency shall execute the re-checks, witnessed by the Commissioning Authority.
    - 2. Use the same test instruments as used in the original TAB work.
    - 3. Failure of more than 10 percent of the re-checked items of a given system shall result in the rejection of the system TAB report; rebalance the system, provide a new system TAB report, and repeat random re-checks.
    - 4. For purposes of re-check, failure is defined as follows:
      - a. Air Flow of Supply and Return: Deviation of more than 10 percent of instrument reading.
      - b. Minimum Outside Air Flow: Deviation of more than 20 percent of instrument reading; for inlet vane or VFD OSA compensation system using linear proportional control, deviation of more than 30 percent at intermediate supply flow.
      - c. Temperatures: Deviation of more than one degree F.
      - d. Air and Water Pressures: Deviation of more than 10 percent of full scale of test instrument reading.
      - e. Sound Pressures: Deviation of more than 3 decibels, with consideration for variations in background noise.
    - 5. For purposes of re-check, a whole system is defined as one in which inaccuracies will have little or no impact on connected systems; for example, the air distribution system served by one air handler or the hydronic chilled water supply system served by a chiller or the condenser water system.
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- F. In the presence of the Commissioning Authority, verify that:
1. Final settings of all valves, splitters, dampers and other adjustment devices have been permanently marked.
  2. The air system is being controlled to the lowest possible static pressure while still meeting design loads, less diversity; this shall include a review of TAB methods, established control setpoints, and physical verification of at least one leg from fan to diffuser having all balancing dampers wide open and that during full cooling of all terminal units taking off downstream of the static pressure sensor, the terminal unit on the critical leg has its damper 90 percent or more open.
  3. The water system is being controlled to the lowest possible pressure while still meeting design loads, less diversity; this shall include a review of TAB methods, established control setpoints, and physical verification of at least one leg from the pump to the coil having all balancing valves wide open and that during full cooling the cooling coil valve of that leg is 90 percent or more open.

### 3.09 SCOPE

- A. Test, adjust, and balance the following:
1. HVAC Pumps.
  2. Packaged Roof Top Heating/Cooling Units.
  3. Air Coils.
  4. Air Handling Units.
  5. Fans.
  6. Air Terminal Units.
  7. Air Inlets and Outlets.

### 3.10 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
1. Manufacturer.
  2. Model/Frame.
  3. HP/BHP.
  4. Phase, voltage, amperage; nameplate, actual, no load.
  5. RPM.
  6. Service factor.
  7. Starter size, rating, heater elements.
  8. Sheave Make/Size/Bore.
- B. V-Belt Drives:
1. Identification/location.
  2. Required driven RPM.
  3. Driven sheave, diameter and RPM.
  4. Belt, size and quantity.
  5. Motor sheave diameter and RPM.
  6. Center to center distance, maximum, minimum, and actual.
- C. Pumps:
1. Identification/number.
  2. Manufacturer.
  3. Size/model.
  4. Impeller.
  5. Service.
  6. Design flow rate, pressure drop, BHP.
  7. Actual flow rate, pressure drop, BHP.
  8. Discharge pressure.
  9. Suction pressure.
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10. Total operating head pressure.
  11. Shut off, discharge and suction pressures.
  12. Shut off, total head pressure.
- D. Combustion Equipment:
1. Boiler manufacturer.
  2. Model number.
  3. Serial number.
  4. Firing rate.
  5. Overfire draft.
  6. Gas meter timing dial size.
  7. Gas meter time per revolution.
  8. Gas flow rate.
  9. Heat input.
  10. Burner manifold gas pressure.
  11. Percent carbon monoxide (CO).
  12. Percent carbon dioxide (CO<sub>2</sub>).
  13. Percent oxygen (O<sub>2</sub>).
  14. Percent excess air.
  15. Flue gas temperature at outlet.
  16. Ambient temperature.
  17. Net stack temperature.
  18. Percent stack loss.
  19. Percent combustion efficiency.
  20. Heat output.
- E. Heating Coils:
1. Identification/number.
  2. Location.
  3. Service.
  4. Manufacturer.
  5. Air flow, design and actual.
  6. Water flow, design and actual.
  7. Water pressure drop, design and actual.
  8. Entering water temperature, design and actual.
  9. Leaving water temperature, design and actual.
  10. Entering air temperature, design and actual.
  11. Leaving air temperature, design and actual.
  12. Air pressure drop, design and actual.
- F. Air Moving Equipment:
1. Location.
  2. Manufacturer.
  3. Model number.
  4. Serial number.
  5. Arrangement/Class/Discharge.
  6. Air flow, specified and actual.
  7. Return air flow, specified and actual.
  8. Outside air flow, specified and actual.
  9. Total static pressure (total external), specified and actual.
  10. Inlet pressure.
  11. Discharge pressure.
  12. Sheave Make/Size/Bore.
  13. Number of Belts/Make/Size.
-



## 14. Fan RPM.

## G. Return Air/Outside Air:

1. Identification/location.
2. Design air flow.
3. Actual air flow.
4. Design return air flow.
5. Actual return air flow.
6. Design outside air flow.
7. Actual outside air flow.
8. Return air temperature.
9. Outside air temperature.
10. Required mixed air temperature.
11. Actual mixed air temperature.
12. Design outside/return air ratio.
13. Actual outside/return air ratio.

## H. Exhaust Fans:

1. Location.
2. Manufacturer.
3. Model number.
4. Serial number.
5. Air flow, specified and actual.
6. Total static pressure (total external), specified and actual.
7. Inlet pressure.
8. Discharge pressure.
9. Sheave Make/Size/Bore.
10. Number of Belts/Make/Size.
11. Fan RPM.

## I. Duct Traverses:

1. System zone/branch.
2. Duct size.
3. Area.
4. Design velocity.
5. Design air flow.
6. Test velocity.
7. Test air flow.
8. Duct static pressure.

## J. Flow Measuring Stations:

1. Identification/number.
2. Location.
3. Size.
4. Manufacturer.
5. Model number.
6. Serial number.
7. Design Flow rate.
8. Design pressure drop.
9. Actual/final pressure drop.
10. Actual/final flow rate.
11. Station calibrated setting.

## K. Terminal Unit Data:

1. Manufacturer.
-



2. Type, constant, variable, single, dual duct.
  3. Identification/number.
  4. Location.
  5. Model number.
  6. Size.
  7. Minimum static pressure.
  8. Minimum design air flow.
  9. Maximum design air flow.
  10. Maximum actual air flow.
  11. Inlet static pressure.
- L. Air Distribution Tests:
1. Air terminal number.
  2. Room number/location.
  3. Terminal type.
  4. Terminal size.
  5. Area factor.
  6. Design velocity.
  7. Design air flow.
  8. Test (final) velocity.
  9. Test (final) air flow.
  10. Percent of design air flow.

**END OF SECTION**



**SECTION 23 0713  
DUCT INSULATION-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Duct insulation.
- B. Insulation jackets.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL.
- C. Section 23 3100 - HVAC Ducts and Casings: Glass fiber ducts.

**1.03 REFERENCE STANDARDS**

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- C. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2021.
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form 2020a.
- E. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- F. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).
- G. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation 2020.
- H. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material) 2019.
- I. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings 2019.
- J. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers 2015.
- K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.
- L. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015, with Editorial Revision (2021).
- M. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.



## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

## **1.07 FIELD CONDITIONS**

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

## **PART 2 PRODUCTS**

### **2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

### **2.02 GLASS FIBER, FLEXIBLE**

- A. Manufacturer:
  - 1. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - 2. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
  - 3. JP Lamborn Co; Thermal Sleeve MT: [www.jpflex.com/#sle](http://www.jpflex.com/#sle).
  - 4. Knauf Insulation; Atmosphere Duct Wrap: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
  - 5. Owens Corning Corporation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
  - 1. K value: 0.36 at 75 degrees F, when tested in accordance with ASTM C518.
  - 2. Maximum Service Temperature: 1200 degrees F.
  - 3. Maximum Water Vapor Absorption: 5.0 percent by weight.
- C. Vapor Barrier Jacket:
  - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
  - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
  - 3. Secure with pressure sensitive tape.
- D. Vapor Barrier Tape:
  - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- E. Indoor Vapor Barrier Mastic:
  - 1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.
- F. Outdoor Vapor Barrier Mastic:
  - 1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.
- G. Tie Wire: Annealed steel, 16 gauge, 0.0508 inch diameter.

### **2.03 GLASS FIBER, RIGID**

- A. Manufacturer:
    - 1. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - 2. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
    - 3. Knauf Insulation: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
    - 4. Owens Corning Corporation; 700 Series FIBERGLAS Insulation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
    - 5. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Insulation: ASTM C612; rigid, noncombustible blanket.
-



1. K Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
2. Maximum Service Temperature: 450 degrees F.
3. Maximum Water Vapor Absorption: 5.0 percent.
4. Maximum Density: 8.0 lb/cu ft.
- C. Vapor Barrier Jacket:
  1. Kraft paper with glass fiber yarn and bonded to aluminized film.
  2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
  3. Secure with pressure sensitive tape.
- D. Vapor Barrier Tape:
  1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- E. Indoor Vapor Barrier Finish:
  1. Cloth: Untreated; 9 oz/sq yd weight, glass fabric.
  2. Vinyl emulsion type acrylic, compatible with insulation, black color.

#### 2.04 JACKETS

- A. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire retardant lagging adhesive.
  1. Lagging Adhesive:
    - a. Manufacturers:
      - 1) Design Polymeric; DP 3050 Water Based, Zero VOC, Premium Quality, Lagging Adhesive, and Vapor Retarder: [www.designpoly.com/#sle](http://www.designpoly.com/#sle).
      - 2) Substitutions: See Section 01 6000 - Product Requirements
    - b. Compatible with insulation.
- B. Aluminum Jacket: ASTM B209 (ASTM B209M).
  1. Thickness: 0.016 inch sheet.
  2. Finish: Smooth.
  3. Joining: Longitudinal slip joints and 2 inch laps.
  4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
  5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
  6. Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.
- C. Flexible Weather-Proofing Outdoor Jacket: Self-healing, field-applied outdoor cladding.
  1. Material: Aluminum foil/polymer laminate with rubberized asphalt layer and acrylic adhesive.
  2. Thickness: 34 mils.
  3. Finish: Embossed.
  4. Color: Silver.
  5. Water Vapor Transmission: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
  6. Mold Resistance: Pass when tested in accordance with ASTM C1338.
  7. Emissivity: 0.30 when tested in accordance with ASTM C1371.

#### 2.05 DUCT LINER

- A. Manufacturers:
  1. Armacell LLC; AP Coilflex: [www.armacell.us/#sle](http://www.armacell.us/#sle).
  2. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  3. Ductmate Industries, Inc, a DMI Company: [www.ductmate.com/#sle](http://www.ductmate.com/#sle).
  4. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
  5. Knauf Insulation: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
  6. Owens Corning Corporation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  7. Substitutions: See Section 01 6000 - Product Requirements.



- B. Elastomeric Foam Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
  - 1. Minimum Service Temperature: Minus 40 degrees F.
  - 2. Maximum Service Temperature: 180 degrees F.
  - 3. Fungal Resistance: No growth when tested according to ASTM G21.
  - 4. Apparent Thermal Conductivity: Maximum of 0.28 at 75 degrees F.
  - 5. Minimum Noise Reduction Coefficients:
    - a. 1 inch Thickness: 0.40.
  - 6. Erosion Resistance: Does not show evidence of breaking away, flaking off, or delamination at velocities of 10,000 fpm per ASTM C1071.
  - 7. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation. Comply with ASTM C916.
- D. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Test ductwork for design pressure prior to applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

#### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Insulated Ducts Conveying Air Below Ambient Temperature:
  - 1. Provide insulation with vapor barrier jackets.
  - 2. Finish with tape and vapor barrier jacket.
  - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
  - 4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- D. Insulated Ducts Conveying Air Above Ambient Temperature:
  - 1. Provide with standard vapor barrier jacket.
  - 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- E. Ducts Exposed in Mechanical Equipment Rooms or Finished Spaces (below 10 feet above finished floor): Finish with canvas jacket sized for finish painting.
- F. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with with calked aluminum jacket with seams located on bottom side of horizontal duct section.
- G. Slope exterior ductwork to shed water.
- H. External Duct Insulation Application:
  - 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
  - 2. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
  - 3. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
- I. Duct and Plenum Liner Application:
  - 1. Adhere insulation with adhesive for 90 percent coverage.
  - 2. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
  - 3. Seal and smooth joints. Seal and coat transverse joints.
  - 4. Seal liner surface penetrations with adhesive.



5. Duct dimensions indicated are net inside dimensions required for air-flow. Increase duct size to allow for insulation thickness.

### **3.03 SCHEDULES**

- A. Combustion Air Duct:
- B. Exhaust Ducts Within 10 ft of Exterior Openings:
  1. Flexible Glass Fiber Duct Insulation: 1-1/2 inches thick.
  2. Rigid Glass Fiber Duct Insulation: 1-1/2 inches thick.
- C. Outside Air Intake Ducts:
  1. Insulation:
    - a. Flexible Glass Fiber Duct Insulation:
      - 1) Thickness required to provide an R value not less than R-12.
    - b. Rigid Glass Fiber Duct Insulation:
      - 1) Thickness required to provide an R value not less than R-12.
- D. Plenums:
  1. Rigid Glass Fiber Duct Insulation: 2 inches thick.
- E. Supply Ducts:
  1. First 10 ft from unit supply/return connections
    - a. Duct Liner
  2. Other than first 10 ft from supply connection
    - a. Flexible Glass Fiber Duct Insulation:
      - 1) Thickness required to provide an R value not less than R-6.
    - b. Rigid Glass Fiber Duct Insulation:
      - 1) Thickness required to provide an R value not less than R-6.
- F. Return and Relief Ducts in Mechanical Rooms:
- G. Ducts Exposed to Outdoors:
  1. Insulation:
    - a. Flexible Glass Fiber Duct Insulation:
      - 1) Thickness required to provide an R value not less than R-12.
    - b. Rigid Glass Fiber Duct Insulation:
      - 1) Thickness required to provide an R value not less than R-12.
  2. Jacket:
    - a. Aluminum Jacket or Flexible Weather-Proofing Outdoor Jacket

**END OF SECTION**



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**SECTION 23 0716**  
**HVAC EQUIPMENT INSULATION-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Equipment insulation.
- B. Flexible removable and reusable blanket insulation.
- C. Covering.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL.
- B. Section 23 2114 - Hydronic Specialties.

**1.03 REFERENCE STANDARDS**

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019.
- D. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement 2007 (Reapproved 2019).
- E. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement 2007 (Reapproved 2019).
- F. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2021.
- G. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation 2017.
- H. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form 2020a.
- I. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation 2021a.
- J. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- K. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type) 2016.
- L. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).
- M. ASTM C1695 - Standard Specification for Fabrication of Flexible Removable and Reusable Blanket Insulation for Hot Service 2020.
- N. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- O. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.
- P. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
-



### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with not less than three years of documented experience.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

### **1.07 FIELD CONDITIONS**

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

## **PART 2 PRODUCTS**

### **2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

### **2.02 GLASS FIBER, FLEXIBLE**

- A. Manufacturers:
  - 1. Johns Manville Corporation; [\_\_\_\_]: [www.jm.com/#sle](http://www.jm.com/#sle).
  - 2. Knauf Insulation; Atmosphere Duct Wrap: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
  - 3. Owens Corning Corporation; [\_\_\_\_]: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C553; flexible, noncombustible.
  - 1. K Value: 0.36 at 75 degrees F, when tested in accordance with ASTM C177 or ASTM C518.
  - 2. Maximum Water Vapor Absorption: 5.0 percent by weight.
- C. Vapor Barrier Jacket: Kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
  - 1. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
  - 2. Secure with self-sealing longitudinal laps and butt strips.
  - 3. Secure with outward clinch expanding staples and vapor barrier mastic.
- D. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- E. Vapor Barrier Lap Adhesive: Compatible with insulation.
- F. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

### **2.03 FLEXIBLE REMOVABLE AND REUSABLE BLANKET INSULATION**

- A. Manufacturers:
    - 1. Auburn Manufacturing Inc; Ever Green Cut 'n Wrap: [www.auburnmfg.com/#sle](http://www.auburnmfg.com/#sle).
    - 2. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Insulation: ASTM C553 Type V; flexible, noncombustible.
    - 1. Comply with ASTM C1695.
    - 2. K Value: 0.37 at 100 degrees F, when tested in accordance with ASTM C177 or ASTM C518.
    - 3. Minimum Service Temperature: 32 degrees F.
    - 4. Maximum Service Temperature: 500 degrees F.
    - 5. Maximum Water Vapor Absorption: Less than 5.0 percent by weight.
    - 6. Color: Green.
-



7. Weight: 7.65 oz per sq ft.
8. Effective Thickness: 1.25 plus/minus 0.25 inch.

#### **2.04 GLASS FIBER, RIGID**

- A. Manufacturer:
  1. CertainTeed Corporation; [ ]: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  2. Johns Manville Corporation; [ ]: [www.jm.com/#sle](http://www.jm.com/#sle).
  3. Knauf Insulation; Earthwool Insulation Board: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
  4. Owens Corning Corporation; [ ]: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C612 or ASTM C592; rigid, noncombustible.
  1. K Value: 0.25 at 75 degrees F, when tested in accordance with ASTM C177 or ASTM C518.
  2. Maximum Service Temperature: 850 degrees F.
  3. Maximum Water Vapor Absorption: 5.0 percent by weight.
  4. Maximum Density: 8.0 lb/cu ft.
- C. Vapor Barrier Jacket:
  1. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
  2. Secure with self-sealing longitudinal laps and butt strips.
  3. Secure with outward clinch expanding staples and vapor barrier mastic.
- D. Facing: 1 inch galvanized steel hexagonal wire mesh stitched on one face of insulation.
- E. Vapor Barrier Lap Adhesive: Compatible with insulation.
- F. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

#### **2.05 CELLULAR GLASS**

- A. Manufacturer:
  1. Owens Corning Corporation; [ ]: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Pipe and Tubing Insulation: ASTM C552, Type II, Grade 6.
  1. K Value: 0.35 at 100 degrees F.
  2. Service Temperature Range: From 250 degrees F to 800 degrees F.
  3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
  4. Water Absorption: 0.5 percent by volume, maximum.
  5. Density: At least 6.12 lb/cu ft.
- C. Block Insulation: ASTM C552, Type I, Grade 6.
  1. K Value: 0.35 at 100 degrees F.
  2. Service Temperature: 800 degrees F, maximum.
  3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
  4. Water Absorption: 0.5 percent by volume, maximum.
  5. Density: At least 6.12 lb/cu ft.

#### **2.06 HYDROUS CALCIUM SILICATE**

- A. Manufacturer:
  - B. Insulation: ASTM C533; rigid molded, asbestos free, gold color.
    1. K Value: 0.40 at 300 degrees F, when tested in accordance with ASTM C177 or ASTM C518.
    2. Maximum Service Temperature: 1200 degrees F.
    3. Density: 15 lb/cu ft.
  - C. Insulating Cement: ASTM C449.
-



## **2.07 FLEXIBLE ELASTOMERIC CELLULAR INSULATION**

- A. Manufacturer:
  - 1. Aeroflex USA, Inc; Aerocel AC Sheet and Roll: [www.aeroflexusa.com/#sle](http://www.aeroflexusa.com/#sle).
  - 2. Armacell LLC; ArmaFlex Ultra with FlameDefense: [www.armacell.us/#sle](http://www.armacell.us/#sle).
  - 3. K-Flex USA LLC; Insul-Sheet: [www.kflexusa.com/#sle](http://www.kflexusa.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements
- B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
  - 1. Minimum Service Temperature: Minus 40 degrees F.
  - 2. Maximum Service Temperature: 220 degrees F.
  - 3. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

## **2.08 JACKETS**

- A. PVC Plastic:
  - 1. Jacket: Sheet material, off-white color.
    - a. Minimum Service Temperature: Minus 40 degrees F.
    - b. Maximum Service Temperature: 150 degrees F.
    - c. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
    - d. Thickness: 10 mil.
    - e. Connections: Brush on welding adhesive.
  - 2. Covering Adhesive Mastic: Compatible with insulation.
- B. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
  - 1. Thickness: 0.016 inch sheet.
  - 2. Finish: Smooth.
  - 3. Joining: Longitudinal slip joints and 2 inch laps.
  - 4. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that equipment has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
  - B. Factory Insulated Equipment: Do not insulate.
  - C. Exposed Equipment: Locate insulation and cover seams in least visible locations.
  - D. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
  - E. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.
  - F. Insulated equipment containing fluids below ambient temperature; insulate entire system.
  - G. Fiber glass insulated equipment containing fluids below ambient temperature; provide vapor barrier jackets, factory-applied or field-applied. Finish with glass cloth and vapor barrier adhesive.
  - H. For hot equipment containing fluids 140 degrees F or less, do not insulate flanges and unions, but bevel and seal ends of insulation.
  - I. For hot equipment containing fluids over 140 degrees F, insulate flanges and unions with removable sections and jackets.
-



- J. Fiber glass insulated equipment containing fluids above ambient temperature; provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Finish with glass cloth and adhesive.
- K. Inserts and Shields:
  - 1. Application: Equipment 1-1/2 inches diameter or larger.
  - 2. Shields: Galvanized steel between hangers and inserts.
  - 3. Insert Location: Between support shield and equipment and under the finish jacket.
  - 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
  - 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- L. Finish insulation at supports, protrusions, and interruptions.
- M. Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with canvas jacket sized for finish painting or PVC jacket and fitting covers.
- N. Exterior Applications:
  - 1. Provide vapor barrier jacket or finish with glass mesh reinforced vapor barrier cement.
  - 2. Cover with aluminum.
- O. Cover glass fiber insulation with metal mesh and finish with heavy coat of insulating cement.
- P. Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.
- Q. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation so it can be easily removed and replaced without damage.

### **3.03 SCHEDULE**

- A. Heating Systems:
  - 1. Air Separators.
  - 2. Steam Condensate Receivers:
  - 3. Condensate Tanks:
  - 4. Flue Gas Breeching:
  - 5. Stacks to Roof:
  - 6. Boiler and Flue Boxes:
  - 7. Boiler Drum Heads:

**END OF SECTION**



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**SECTION 23 0719  
HVAC PIPING INSULATION-CPL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Piping insulation.
- B. Flexible removable and reusable blanket insulation.
- C. Jackets and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 23 2213 - Steam and Condensate Heating Piping: Placement of hangers and hanger inserts.

**1.03 REFERENCE STANDARDS**

- A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus 2019.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- D. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019.
- E. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement 2007 (Reapproved 2019).
- F. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement 2007 (Reapproved 2019).
- G. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2021.
- H. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation 2017.
- I. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation 2019.
- J. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel 2008 (Reapproved 2018).
- K. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation 2021.
- L. ASTM D610 - Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces 2008 (Reapproved 2019).
- M. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.



- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum 5 years of experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

#### **1.07 FIELD CONDITIONS**

- A. Maintain ambient conditions required by manufacturers of each product.  
B. Maintain temperature before, during, and after installation for minimum of 24 hours.

### **PART 2 PRODUCTS**

#### **2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

#### **2.02 GLASS FIBER, RIGID**

- A. Manufacturers:
1. CertainTeed Corporation; [ ]: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  2. Johns Manville Corporation; [ ]: [www.jm.com/#sle](http://www.jm.com/#sle).
  3. Knauf Insulation; Earthwool 1000 Degree Pipe Insulation: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
  4. Owens Corning Corporation; Fiberglas Pipe Insulation ASJ: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  5. Owens Corning Corporation; VaporWick Pipe Insulation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
1. K Value: ASTM C177, 0.24 at 75 degrees F.
  2. Maximum Service Temperature: 850 degrees F.
  3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible, with wicking material to transport condensed water to the outside of the system for evaporation to the atmosphere.
1. K Value: ASTM C177, 0.23 at 75 degrees F.
  2. Maximum Service Temperature: 220 degrees F.
  3. Maximum Moisture Absorption: 0.2 percent by volume.
- D. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.
- E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- F. Vapor Barrier Lap Adhesive: Compatible with insulation.
- G. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.
- H. Fibrous Glass Fabric:
1. Cloth: Untreated; 9 oz/sq yd weight.
  2. Blanket: 1.0 lb/cu ft density.
  3. Weave: 5 by 5.
- I. layoff
1. Cloth: Untreated; 9 oz/sq yd weight.
  2. Vinyl emulsion type acrylic, compatible with insulation, architect to select color.
- J. Insulating Cement: ASTM C449.

#### **2.03 HYDROUS CALCIUM SILICATE**

- A. Manufacturers:



- 
1. Johns Manville Corporation; [\_\_\_\_]: [www.jm.com/#sle](http://www.jm.com/#sle).
  2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C533 and ASTM C795; rigid molded, asbestos free, gold color.
1. K Value: 0.40 at 300 degrees F, when tested in accordance with ASTM C177 or ASTM C518.
  2. Maximum Service Temperature: 1200 degrees F.
  3. Density: 15 lb/cu ft.
- C. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- D. Insulating Cement: ASTM C449.
1. Maximum Service Temperature: 165 degrees F.
  2. Maximum Water Vapor Permeance: 5.0 perms.
- E. Density: Type X, 1.30 pcf (21 kg/cu m), minimum.

## 2.04 JACKETS

- A. PVC Plastic.
1. Manufacturers:
    - a. Johns Manville Corporation; [\_\_\_\_]: [www.jm.com/#sle](http://www.jm.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
  2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
    - a. Minimum Service Temperature: 0 degrees F.
    - b. Maximum Service Temperature: 150 degrees F.
    - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
    - d. Thickness: 10 mil.
    - e. Connections: Brush on welding adhesive.
  3. Covering Adhesive Mastic: Compatible with insulation.
- B. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
1. Thickness: 0.016 inch sheet.
  2. Finish: Smooth.
  3. Joining: Longitudinal slip joints and 2 inch laps.
  4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
  5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
- C. Vapor Barrier Membranes: ASTM C1136, Type IX.
1. Multilayer Laminate Vapor Barrier:
    - a. Thickness: 2.4 mil.
    - b. Moisture Vapor Permeability: 0.00 perm inch, when tested in accordance with ASTM E96/E96M.
    - c. Manufacturers:
      - 1) Polyguard Products; ZERO-PERM: [www.polyguardproducts.com/#sle](http://www.polyguardproducts.com/#sle).
      - 2) Substitutions: See Section 01 6000 - Product Requirements.

## 2.05 ACCESSORIES

- A. General Requirements:
1. Provide required accessories in accordance with and subject to the recommendations of the insulation manufacturer.
  2. Furnish compatible materials which do not contribute to corrosion, soften, or otherwise attack surfaces to which applied, in either the wet or dry state.
  3. Comply with ASTM C795 requirements for materials to be used on stainless steel surfaces.
  4. Supply materials that are asbestos free.
- B. Corrosion Inhibitors:
1. Corrosion Control Gel:
-



- a. Manufacturers:
  - 1) Polyguard Products; RG2400LT: [www.polyguardproducts.com/#sle](http://www.polyguardproducts.com/#sle).
  - 2) Substitutions: See Section 01 6000 - Product Requirements.
- b. Corrosion Protection: Comply with ASTM B117 and ASTM D610.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Test piping for design pressure, liquid tightness, and continuity prior to applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
  - B. Install in accordance with NAIMA National Insulation Standards.
  - C. Exposed Piping: Locate insulation and cover seams in least visible locations.
  - D. Insulated Pipes Conveying Fluids Below Ambient Temperature:
    - 1. Insulate entire system, including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
  - E. Glass Fiber Insulated Pipes Conveying Fluids Below Ambient Temperature:
    - 1. Provide vapor barrier jackets, factory-applied or field-applied; secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
    - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
  - F. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
  - G. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
  - H. Glass Fiber Insulated Pipes Conveying Fluids Above Ambient Temperature:
    - 1. Provide standard jackets, with or without vapor barrier, factory-applied, or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
    - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
  - I. Inserts and Shields:
    - 1. Application: Piping 1-1/2 inches diameter or larger.
    - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
    - 3. Insert location: Between support shield and piping and under the finish jacket.
    - 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
    - 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
  - J. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
  - K. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with PVC jacket and fitting covers.
  - L. Concealed Piping: Finish with fitting covers on flanges, fittings, valves, and specialties.
-



- M. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping. Provide two coats of UV resistant finish for flexible elastomeric cellular insulation without jacketing.

### **3.03 SCHEDULE**

- A. Heating Systems:
1. Low Pressure Steam Piping (250 deg. F and Below):
    - a. NPS 3-1/2 and Smaller: 2-1/2 inch thick Rigid Glass Fiber.
    - b. NPS 4 and Larger: 3 inch thick Rigid Glass Fiber.
  2. Low Pressure, Gravity, and Pumped Steam Condensate:
    - a. NPS 3-1/2 and Smaller: 2-1/2 inch thick Rigid Glass Fiber.
    - b. NPS 4 and Larger: 3 inch thick Rigid Glass Fiber.
  3. Boiler Feed Water:
    - a. NPS 1-1/4 and Smaller: 1 inch thick Rigid Glass Fiber.
    - b. NPS 1-1/2 and Larger: 1-1/2 inch thick Rigid Glass Fiber.

**END OF SECTION**



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**SECTION 23 0800  
COMMISSIONING OF HVAC**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. See Section 01 9113 - General Commissioning Requirements for overall objectives; comply with the requirements of Section 01 9113.
- B. This section covers the Contractor's responsibilities for commissioning; each subcontractor or installer responsible for the installation of a particular system or equipment item to be commissioned is responsible for the commissioning activities relating to that system or equipment item.
- C. The Commissioning Authority (CA) directs and coordinates all commissioning activities and provides Prefunctional Checklists and Functional Test Procedures for Contractor's use.
- D. The entire HVAC system is to be commissioned, including commissioning activities for the following specific items:
  - 1. Major and minor equipment items.
  - 2. Piping systems and equipment.
  - 3. Ductwork and accessories.
  - 4. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.
- E. The Prefunctional Checklist and Functional Test requirements specified in this section are in addition to, not a substitute for, inspection or testing specified in other sections.

**1.02 REFERENCE STANDARDS**

- A. ASHRAE Guideline 1.1 - HVAC&R Technical Requirements for the Commissioning Process 2007, with Errata (2012).

**1.03 SUBMITTALS**

- A. Updated Submittals: Keep the Commissioning Authority informed of all changes to control system documentation made during programming and setup; revise and resubmit when substantial changes are made.
- B. Startup Reports, Prefunctional Checklists, and Trend Logs: Submit for approval of Commissioning Authority.
- C. HVAC Control System O&M Manual Requirements. In addition to documentation specified elsewhere, compile and organize at minimum the following data on the control system:
  - 1. Specific step-by-step instructions on how to perform and apply all functions, features, modes, etc. mentioned in the controls training sections of this specification and other features of this system. Provide an index and clear table of contents. Include the detailed technical manual for programming and customizing control loops and algorithms.
  - 2. Full as-built set of control drawings.
  - 3. Full as-built sequence of operations for each piece of equipment.
  - 4. Full points list; in addition to the information on the original points list submittal, include a listing of all rooms with the following information for each room:
    - a. Floor.
    - b. Room number.
    - c. Room name.
    - d. Air handler unit ID.
    - e. Reference drawing number.
    - f. Air terminal unit tag ID.
    - g. Heating and/or cooling valve tag ID.
    - h. Minimum air flow rate.
    - i. Maximum air flow rate.



5. Full print out of all schedules and set points after testing and acceptance of the system.
6. Full as-built print out of software program.
7. Electronic copy on disk of the entire program for this facility.
8. Marking of all system sensors and thermostats on the as-built floor plan and HVAC drawings with their control system designations.
9. Maintenance instructions, including sensor calibration requirements and methods by sensor type, etc.
10. Control equipment component submittals, parts lists, etc.
11. Warranty requirements.
12. Copies of all checkout tests and calibrations performed by the Contractor (not commissioning tests).
13. Organize and subdivide the manual with permanently labeled tabs for each of the following data in the given order:
  - a. Sequences of operation.
  - b. Control drawings.
  - c. Points lists.
  - d. Controller and/or module data.
  - e. Thermostats and timers.
  - f. Sensors and DP switches.
  - g. Valves and valve actuators.
  - h. Dampers and damper actuators.
  - i. Program setups (software program printouts).
- D. Project Record Documents: See Section 01 7800 for additional requirements.
  1. Submit updated version of control system documentation, for inclusion with operation and maintenance data.
  2. Show actual locations of all static and differential pressure sensors (air, water and building pressure) and air-flow stations on project record drawings.
- E. Draft Training Plan: In addition to requirements specified in Section 01 7900, include:
  1. Follow the recommendations of ASHRAE Guideline 1.1.
  2. Control system manufacturer's recommended training.
  3. Demonstration and instruction on function and overrides of any local packaged controls not controlled by the HVAC control system.
- F. Training Manuals: See Section 01 7900 for additional requirements.
  1. Provide three extra copies of the controls training manuals in a separate manual from the O&M manuals.

## **PART 2 PRODUCTS**

### **2.01 TEST EQUIPMENT**

- A. Provide all standard testing equipment required to perform startup and initial checkout and required functional performance testing; unless otherwise noted such testing equipment will NOT become the property of Owner.
- B. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Cooperate with the Commissioning Authority in development of the Prefunctional Checklists and Functional Test Procedures.
  - B. Furnish additional information requested by the Commissioning Authority.
-



- C. Prepare a preliminary schedule for HVAC pipe and duct system testing, flushing and cleaning, equipment start-up and testing, adjusting, and balancing start and completion for use by the Commissioning Authority; update the schedule as appropriate.
- D. Notify the Commissioning Authority when pipe and duct system testing, flushing, cleaning, startup of each piece of equipment and testing, adjusting, and balancing will occur; when commissioning activities not yet performed or not yet scheduled will delay construction notify ahead of time and be proactive in seeing that the Commissioning Authority has the scheduling information needed to efficiently execute the commissioning process.
- E. Put all HVAC equipment and systems into operation and continue operation during each working day of testing, adjusting, and balancing and commissioning, as required.
- F. Provide test holes in ducts and plenums where directed to allow air measurements and air balancing; close with an approved plug.
- G. Provide temperature and pressure taps in accordance with Contract Documents.

### **3.02 INSPECTING AND TESTING - GENERAL**

- A. Submit startup plans, startup reports, and Prefunctional Checklists for each item of equipment or other assembly to be commissioned.
- B. Perform the Functional Tests directed by the Commissioning Authority for each item of equipment or other assembly to be commissioned.
- C. Provide two-way radios for use during the testing.
- D. Valve/Damper Stroke Setup and Check:
  - 1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
  - 2. Set pump/fan to normal operating mode.
  - 3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
  - 4. Command valve/damper open; verify position is full open and adjust output signal as required.
  - 5. Command valve/damper to a few intermediate positions.
  - 6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).
- E. Isolation Valve or System Valve Leak Check: For valves not by coils.
  - 1. With full pressure in the system, command valve closed.
  - 2. Use an ultra-sonic flow meter to detect flow or leakage.
- F. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.

### **3.03 TAB COORDINATION**

- A. TAB: Testing, adjusting, and balancing of HVAC.
- B. Coordinate commissioning schedule with TAB schedule.
- C. Review the TAB plan to determine the capabilities of the control system toward completing TAB.
- D. Provide all necessary unique instruments and instruct the TAB technicians in their use; such as handheld control system interface for setting terminal unit boxes, etc.
- E. Have all required Prefunctional Checklists, calibrations, startup and component Functional Tests of the system completed and approved by the Commissioning Authority prior to starting TAB.
- F. Provide a qualified control system technician to operate the controls to assist the TAB technicians or provide sufficient training for the TAB technicians to operate the system without assistance.



### **3.04 CONTROL SYSTEM FUNCTIONAL TESTING**

- A. Prefunctional Checklists for control system components will require a signed and dated certification that all system programming is complete as required to accomplish the requirements of Contract Documents and the detailed Sequences of Operation documentation submittal.
- B. Do not start Functional Testing until all controlled components have themselves been successfully Functionally Tested in accordance with Contract Documents.
- C. Using a skilled technician who is familiar with this building, execute the Functional Testing of the control system as required by the Commissioning Authority.
- D. Functional Testing of the control system constitutes demonstration and trend logging of control points monitored by the control system.
  - 1. The scope of trend logging is partially specified; trend log up to 50 percent more points than specified at no extra cost to Owner.
  - 2. Perform all trend logging specified in Prefunctional Checklists and Functional Test procedures.
- E. Functionally Test integral or stand-alone controls in conjunction with the Functional Tests of the equipment they are attached to, including any interlocks with other equipment or systems; further testing during control system Functional Test is not required unless specifically indicated below.
- F. Demonstrate the following to the Commissioning Authority during testing of controlled equipment; coordinate with commissioning of equipment.
  - 1. Setpoint changing features and functions.
  - 2. Sensor calibrations.
- G. Demonstrate to the Commissioning Authority:
  - 1. That all specified functions and features are set up, debugged and fully operable.
  - 2. That scheduling features are fully functional and setup, including holidays.
  - 3. That all graphic screens and value readouts are completed.
  - 4. Correct date and time setting in central computer.
  - 5. That field panels read the same time as the central computer; sample 10 percent of field panels; if any of those fail, sample another 10 percent; if any of those fail test all remaining units at no extra cost to Owner.
  - 6. Functionality of field panels using local operator keypads and local ports (plug-ins) using portable computer/keypad; demonstrate 100 percent of panels and 10 percent of ports; if any ports fail, sample another 10 percent; if any of those fail, test all remaining units at no extra cost to Owner.
  - 7. Power failure and battery backup and power-up restart functions.
  - 8. Global commands features.
  - 9. Security and access codes.
  - 10. Occupant over-rides (manual, telephone, key, keypad, etc.).
  - 11. O&M schedules and alarms.
  - 12. Occupancy sensors and controls.
  - 13. All control strategies and sequences not tested during controlled equipment testing.
- H. If the control system, integral control components, or related equipment do not respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice, under any of the conditions, sequences, or modes tested, correct all systems, equipment, components, and software required at no additional cost to Owner.

### **3.05 OPERATION AND MAINTENANCE MANUALS**

- A. See Section 01 7800 for additional requirements.
-



- B. Add design intent documentation furnished by Architect/Engineer to manuals prior to submission to Owner.
- C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.
- D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

### **3.06 DEMONSTRATION AND TRAINING**

- A. See Section 01 7900 for additional requirements.
- B. Demonstrate operation and maintenance of HVAC system to Owner' personnel; if during any demonstration, the system fails to perform in accordance with the information included in the O&M manual, stop demonstration, repair or adjust, and repeat demonstration. Demonstrations may be combined with training sessions if appropriate.
- C. These demonstrations are in addition to, and not a substitute for, Prefunctional Checklists and demonstrations to the Commissioning Authority during Functional Testing.
- D. Provide classroom and hands-on training of Owner's designated personnel on operation and maintenance of the HVAC system, control system, and all equipment items indicated to be commissioned. Provide the following minimum durations of training:
  - 1. HVAC Control System: 8 hours.
  - 2. Boilers and System: 16 hours.
  - 3. Chemical Treatment: [ ] hours.
  - 4. Air Handling Units: 4 hours.
  - 5. Return Fan/Relief Fan: 1 hours.
- E. TAB Review: Instruct Owner's personnel for minimum [ ] hours, after completion of TAB, on the following:
  - 1. Review final TAB report, explaining the layout and meanings of each data type.
  - 2. Discuss any outstanding deficient items in control, ducting or design that may affect the proper delivery of air or water.
  - 3. Identify and discuss any terminal units, duct runs, diffusers, coils, fans and pumps that are close to or are not meeting their design capacity.
  - 4. Discuss any temporary settings and steps to finalize them for any areas that are not finished.
  - 5. Other salient information that may be useful for facility operations, relative to TAB.
- F. HVAC Control System Training: Perform training in at least three phases:
  - 1. Phase 1 - Basic Control System: Provide minimum of [ ] hours of actual training on the control system itself. Upon completion of training, each attendee, using appropriate documentation, should be able to perform elementary operations and describe general hardware architecture and functionality of the system.
    - a. This training may be held on-site or at the manufacturer's facility.
    - b. If held off-site, the training may occur prior to final completion of the system installation.
    - c. For off-site training, Contractor shall pay expenses of up to two attendees.
  - 2. Phase 2 - Integrating with HVAC Systems: Provide minimum of [ ] hours of on-site, hands-on training after completion of Functional Testing. Include instruction on:
    - a. The specific hardware configuration of installed systems in this facility and specific instruction for operating the installed system, including interfaces with other systems, if any.



- b. Security levels, alarms, system start-up, shut-down, power outage and restart routines, changing setpoints and alarms and other typical changed parameters, overrides, freeze protection, manual operation of equipment, optional control strategies that can be considered, energy savings strategies and set points that if changed will adversely affect energy consumption, energy accounting, procedures for obtaining vendor assistance, etc.
  - c. Trend logging and monitoring features (values, change of state, totalization, etc.), including setting up, executing, downloading, viewing both tabular and graphically and printing trends; provide practice in setting up trend logging and monitoring during training session.
  - d. Every display screen, allowing time for questions.
  - e. Point database entry and modifications.
- 3. Phase 3 - Post-Occupancy: Six months after occupancy conduct minimum of [ ] hours of training. Tailor training session to questions and topics solicited beforehand from Owner. Also be prepared to address topics brought up and answer questions concerning operation of the system.
- G. Provide the services of manufacturer representatives to assist instructors where necessary.
- H. Provide the services of the HVAC controls instructor at other training sessions, when requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.

**END OF SECTION**



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**SECTION 23 0913**  
**INSTRUMENTATION AND CONTROL DEVICES FOR HVAC****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Control panels.
- B. Control Valves:
  - 1. Ball valves and actuators.
  - 2. Globe pattern.
  - 3. Butterfly pattern.
  - 4. Electronic operators.
  - 5. Radiation valves.
- C. Dampers.
- D. Damper Operators:
  - 1. Electric operators.
- E. Humidistats:
- F. Input/Output Sensors:
  - 1. Temperature sensors.
  - 2. Humidity sensors.
  - 3. Static pressure (air pressure) sensors.
  - 4. Equipment operation (current) sensors.
  - 5. Damper position indicators.
  - 6. Nitrogen dioxide sensors.
  - 7. Carbon monoxide sensors.
  - 8. Carbon dioxide sensors.
- G. Thermostats:
  - 1. Electric room thermostats.
  - 2. Low-limit temperature cutout switch (freezestat)
  - 3. Line voltage thermostats.
  - 4. Room thermostat accessories.
  - 5. Outdoor reset thermostats.
- H. Time clocks.
- I. Transmitters:
  - 1. Building static pressure transmitters.
  - 2. Pressure transmitters.
  - 3. Water pressure transmitters (liquid differential pressure transmitters).
  - 4. Temperature transmitters.
- J. Transducers:
  - 1. Electropneumatic transducers.
- K. Flow Sensors:
  - 1. Flow switches.
- L. Level Instruments:
  - 1. Submersible level transmitters (Liquids other than potable water).

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0519 - Meters and Gauges for HVAC Piping-CPL: Thermometer sockets and gauge taps.
  - B. Section 23 0548 - Vibration and Seismic Controls for HVAC.
-



- C. Section 23 2213 - Steam and Condensate Heating Piping: Installation of control valves, flow switches, temperature sensor sockets, and gauge taps.
- D. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

### 1.03 REFERENCE STANDARDS

- A. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating 2018.
- B. ANSI/FCI 70-2 - Control Valve Seat Leakage 2021.
- C. IEC 60529 - Degrees of Protection Provided by Enclosures (IP Code) 2013 (Corrigendum 2019).
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- E. NEMA DC 3 - Residential Controls - Electrical Wall-Mounted Room Thermostats 2013.

### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

### 1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide description and engineering data for each control system component. Include sizing as requested. Provide data for each system component and software module.
- C. Shop Drawings: Indicate complete operating data, system drawings, wiring diagrams, and written detailed operational description of sequences. Submit schedule of valves indicating size, flow, and pressure drop for each valve. For automatic dampers indicate arrangement, velocities, and static pressure drops for each system.
- D. Manufacturer's Instructions: Provide for all manufactured components.

### 1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Schneider Electric Building Automation Controls, furnished and installed by: Technical Building Services, Inc. Ballston Spa, NY 12020 Contact: Ed Rockstroh (P): (518) 885-4444 (E): edrockstroh@tbscontrols.com.

### 2.02 EQUIPMENT - GENERAL

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

### 2.03 CONTROL PANELS

- A. Unitized cabinet type for each system under automatic control with relays and controls mounted in cabinet and temperature indicators, pressure gauges, pilot lights, push buttons and switches flush on cabinet panel face.
- B. NEMA 250, general purpose utility enclosures with enameled finished face panel.
- C. Provide common keying for all panels.

### 2.04 CONTROL VALVES

- A. Ball Valves and Actuators:
  - 1. Manufacturers:
    - a. Belimo Aircontrols (USA), Inc; [\_\_\_\_]: [www.belimo.com/#sle](http://www.belimo.com/#sle).
    - b. Johnson Controls International, PLC; [\_\_\_\_]: [www.johnsoncontrols.com/#sle](http://www.johnsoncontrols.com/#sle).
    - c. Schneider Electric; [\_\_\_\_]: [www.schneider-electric.us/#sle](http://www.schneider-electric.us/#sle).



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2. Service: Use for brine (30 percent glycol), chilled water, hot water, or steam at 15 to 25 psig (104.4 to 172.4).
  3. Flow Characteristic: Include 2-way and 3-way diverting operation configured to fail normally closed (NC).
  4. Replacements in Kind: Provide pressure-independent type.
  5. Rangeability: 500 to 1.
  6. ANSI Rating: Class 150.
  7. Leakage: Class IV (0.1 percent of rated capacity) per ANSI/FCI 70-2.
  8. Body Size:
    - a. Under 2-1/2 inches:
      - 1) Connection: NPT.
      - 2) Materials:
        - (a) Body: Brass.
        - (b) Flanges: Ductile iron.
        - (c) Ball: Chrome-plated brass.
        - (d) Stem: Nickel-plated brass.
        - (e) Seat: Graphite-reinforced PTFE with EPDM O-Ring backing.
        - (f) Stem Seal: EPDM O-Rings.
        - (g) Flow Control Disk: Thermoplastic synthetic-resin.
    - b. 2-1/2 inches and Above:
      - 1) Connection Type: Flanged.
      - 2) Materials:
        - (a) Body: Brass.
        - (b) Flanges: Ductile iron.
        - (c) Ball: 300 series stainless steel.
        - (d) Stem: 300 series stainless steel.
        - (e) Seat: Graphite-reinforced PTFE with EPDM O-Ring backing.
        - (f) Stem Seal: EPDM O-Rings.
        - (g) Flow Control Disk: Thermoplastic synthetic-resin.
    - c. Service Temperature:
      - 1) Fluid Side: 0 to 284 degrees F liquid or 25 psig steam.
      - 2) Ambient Side: From minus 4 to 122 degrees F.
  9. Actuator Requirements:
    - a. Assembly: Factory-mounted.
    - b. Input: 0 to 5 VDC configured for proportional control.
    - c. Accessories: Provide with valve position indicator and manual override.
  - B. Globe Pattern:
    1. Up to 2 inches: Bronze body, bronze trim, rising stem, renewable composition disc, screwed ends with backseating capacity repackable under pressure.
    2. Over 2 inches: Iron body, bronze trim, rising stem, plug-type disc, flanged ends, renewable seat and disc.
    3. Steam Systems:
  - C. Butterfly Pattern:
  - D. Electronic Operators:
    1. Valves shall spring return to normal position as indicated on freeze, fire, or temperature protection.
  - E. Radiation Valves:
    1. Bronze body, bronze trim, 2 or 3 port as indicated, replaceable plugs and seats, union and threaded ends.
    2. Rate for service pressure of 125 psig at 250 degrees F.
    3. Size for 3 psig maximum pressure drop at design flow rate.
-



4. two-way valves shall have equal percentage characteristics, three way valves linear characteristics. Size two-way valve operators to close valves against pump shut off head.

## 2.05 DAMPERS

- A. Performance: Test in accordance with AMCA 500-D.
- B. Frames: Galvanized steel, welded or riveted with corner reinforcement, minimum 12 gauge, 0.1046 inch.
- C. Blades: Galvanized steel, maximum blade size 8 inches wide, 48 inches long, minimum 22 gauge, 0.0299 inch, attached to minimum 1/2 inch shafts with set screws.
- D. Blade Seals: Synthetic elastomeric, inflatable, mechanically attached, field replaceable.
- E. Jamb Seals: Spring stainless steel.
- F. Shaft Bearings: Oil impregnated sintered bronze.
- G. Linkage Bearings: Oil impregnated sintered bronze.
- H. Leakage: Less than one percent based on approach velocity of 2000 ft per min and 4 inches wg.
- I. Maximum Pressure Differential: 6 inches wg.
- J. Temperature Limits: Minus 40 to 200 degrees F.

## 2.06 HUMIDISTATS

### 2.07 INPUT/OUTPUT SENSORS

- A. Temperature Sensors:
  1. Use thermistor or RTD type temperature sensing elements with characteristics resistant to moisture, vibration, and other conditions consistent with the application without affecting accuracy and life expectancy.
  2. Construct RTD of nickel or platinum with base resistance of 1000 ohms at 70 degrees F.
  3. 100 ohm platinum RTD is acceptable if used with project DDC controllers.
  4. Performance Characteristics:
    - a. Sensing Range:
      - 1) Provide limited range sensors if required to sense the range expected for a respective point.
    - b. Wire Resistance:
    - c. Room Sensors: Locking cover matching the pneumatic thermostats used.
    - d. Room Temperature Sensors:
      - 1) Construct for surface, wall box, or [ ] mounting.
      - 2) Provide the following:
    - e. Room Temperature Sensors with Integral Digital Display:
      - 1) Construct for surface, wall box, or [ ].
      - 2) Provide a four button keypad with the following capabilities:
        - (a) Indication of space and outdoor temperatures.
        - (b) Setpoint adjustment to accommodate room setpoint, DDC Input/Output Points List, Sequence of Operation, and [ ].
        - (c) Display and control fan operation status.
        - (d) Manual occupancy override and indication of occupancy status.
        - (e) Controller mode status.
        - (f) Password enabled setpoint and override modes.
- B. Carbon Monoxide Sensors, for Single-Gang Electrical Box Mounting:
  1. General:
    - a. Provide gas platform, wired to the building controller, with replaceable sensor.
    - b. Input Power: Class 2; 15 to 30 VDC/24 VAC plus/minus 20 percent, 50/60 Hz.



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- c. Relay Ratings: 1A/30VAC/DC, normally open.
  - d. Operating Temperature Range: Minus 4 degrees F to 122 degrees F.
  - e. Operating Humidity Range: 0 to 90 percent RH non-condensing.
  - f. Terminal Block Wire Size: 30 AWG (0.255 mm) by 12 AWG (2.05 mm).
  - g. Terminal Block Torque: 0.37 to 0.44 inch-lbf.
  - h. Protection Class: IP20 in accordance with IEC 60529.
  - 2. Sensor:
    - a. Measurement Range: 0 to 200 ppm.
    - b. Accuracy: Plus/minus 5 percent of range.
    - c. Resolution: 1 ppm.
    - d. Sensor Warranty: 2 years from manufacture date.
    - e. Low Setpoint Value: 25 ppm or 50 ppm switch selectable.
  - C. Carbon Dioxide Sensors, Duct and Wall:
    - 1. General: Provide non-dispersive infrared (NDIR), diffusion sampling CO2 sensors with integral transducers and linear output.
    - 2. Air Temperature: Range of 32 to 122 degrees F.
    - 3. Relative Humidity: Range of 0 to 95 percent (non-condensing).
    - 4. Power Input: Class 2; 12 to 30VDC or 24VAC 50/60 Hz; 100mA max.
    - 5. Calibration Characteristics:

## 2.08 THERMOSTATS

- A. Electric Room Thermostats:
  - 1. Type: NEMA DC 3, 24 volts, with setback/setup temperature control.
  - 2. Covers: Locking with set point adjustment, with thermometer.
- B. Room Thermostat Accessories:
  - 1. Thermostat Covers: Brushed aluminum.
  - 2. Insulating Bases: For thermostats located on exterior walls.
  - 3. Thermostat Guards: Metal mounted on separate base.
  - 4. Adjusting Key: As required for device.
  - 5. Aspirating Boxes: Where indicated for thermostats requiring flush installation.

## 2.09 TIME CLOCKS

- A. Seven day programming switch timer with synchronous timing motor and seven day dial, continuously charged Ni-cad battery driven power failure 8 hour carry over and multiple switch trippers to control systems for minimum of two and maximum of eight signals per day with two normally open and two normally closed output switches.

## 2.10 TRANSMITTERS

- A. Building Static Pressure Transmitters:
    - 1. One pipe, direct acting, double bell, scale range 0.01 to 6.0 inch wg positive or negative, and sensitivity of 0.0005 inch wg. Transmit electronic signal to receiver with matching scale range.
  - B. Pressure Transmitters:
    - 1. One pipe direct acting indicating type for gas, liquid, or steam service, range suitable for system, proportional electronic output.
  - C. Water Pressure Transmitters (Liquid Differential Pressure Transmitters):
    - 1. Manufacturers:
    - 2. General: Provide wet media differential pressure transducers with 6 ft (1.83 m) armored cable, to allow remote pressure sensing capability using existing plumbing runs.
      - a. Pressure Ranges:
        - 1) 0 psi to 50 psi (Gauge): 5 psid/10 psid/25 psid/50 psid (pressure differential).
  - D. Temperature Transmitters:
-



1. One pipe, directly proportional output signal to measured variable, linearity within plus or minus 1/2 percent of range for 200 degrees F span and plus or minus 1 percent for 50 degrees F span, with 50 degrees F. temperature range, compensated bulb, averaging capillary, or rod and tube operation on 20 psig input pressure and 3 to 15 psig output.

## **2.11 TRANSDUCERS**

### **A. Electropneumatic Transducers:**

1. General: Provide electropneumatic pressure transducer utilizing micro-controlled poppet valve technology for pressure sensing in multiple applications.

## **2.12 LEVEL INSTRUMENTS**

### **A. Submersible Level Transmitters (Liquids Other Than Potable Water):**

1. Provide for aluminum tanks, chemical storage tanks, oil tanks, wastewater, sludge pits, clarifiers, digesters, lime slurry, sumps, reservoirs, and [\_\_\_\_\_].
2. Function: Measurement of the height of liquid above the position in the tank referenced to atmospheric pressure.
3. Material: Piezoresistive sensing element, encased in a 316 stainless steel housing.
4. Large diameter 316 stainless steel diaphragm seal, non-clogging and damage resistant to floating solids.
5. Equip with a minimum 270 lb tensile strength, shielded and vented cable.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that systems are ready to receive work.
- C. Beginning of installation means installer accepts existing conditions.
- D. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.
- E. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.
- F. Ensure installation of components is complementary to installation of similar components.
- G. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Check and verify location of thermostats with plans and room details before installation. Locate 60 inches above floor. Align with lighting switches and humidistats. Refer to Section 26 2726.
- C. Mount freeze protection thermostats using flanges and element holders.
- D. Mount outdoor reset thermostats and outdoor sensors indoors, with sensing elements outdoors with sun shield.
- E. Provide separable sockets for liquids and flanges for air bulb elements.
- F. Provide guards on thermostats in entrances and public areas.
- G. Provide separate steam valves for each bank of coils. Provide two valves in parallel where steam load exceeds 1500 lb per hr with 1/3 to 2/3 load capacities sequenced with smaller valve opening first.
- H. Provide isolation (two position) dampers of parallel blade construction.
- I. Install damper motors on outside of duct in warm areas. Do not install motors in locations at outdoor temperatures.



- J. Mount control panels adjacent to associated equipment on vibration free walls or free standing angle iron supports. One cabinet may accommodate more than one system in same equipment room. Provide engraved plastic nameplates for instruments and controls inside cabinet and engraved plastic nameplates on cabinet face.
- K. Install "hand/off/auto" selector switches to override automatic interlock controls when switch is in "hand" position.
- L. Provide conduit and electrical wiring in accordance with Section 26 0583. Electrical material and installation shall be in accordance with appropriate requirements of Division 26.

### **3.03 MAINTENANCE**

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Provide service and maintenance of control system for one year from Date of Substantial Completion.
- C. Provide complete service of controls systems, including call backs, and submit written report of each service call.
- D. In addition to normal service calls, make minimum of [ ] complete normal inspections of approximately [ ] hours duration to inspect, calibrate, and adjust controls.

### **3.04 SCHEDULES**

- A. Control Valve Schedule
  - 1. Valve Size
  - 2. Valve CV
  - 3. Normal Position
- B. Control Damper Schedule
  - 1. Height
  - 2. Air Flow
  - 3. Air Pressure Drop

**END OF SECTION**



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**SECTION 23 0934**  
**VARIABLE-FREQUENCY MOTOR CONTROLLERS-CPL****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Variable-frequency motor controllers for low-voltage (600 V and less) AC motor applications.
- B. Overcurrent protective devices for motor controllers, including overload relays.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0529 - Hangers and Supports for HVAC Piping and Equipment-CPL.
- B. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL: Identification products and requirements.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0573 - Power System Studies: Additional criteria for selection and adjustment of equipment and associated protective devices specified in this section.

**1.03 REFERENCE STANDARDS**

- A. IEC 60529 - Degrees of Protection Provided by Enclosures (IP Code) 2013 (Corrigendum 2019).
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts 2008 (Reaffirmed 2020).
- D. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices 2017.
- E. NEMA ICS 6 - Industrial Control and Systems: Enclosures 1993 (Reaffirmed 2016).
- F. NEMA ICS 7 - Industrial Control and Systems: Adjustable-Speed Drives 2020.
- G. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable-Speed Drive Systems 2014.
- H. NEMA ICS 7.2 - Application Guide for AC Adjustable Speed Drive Systems 2021.
- I. NEMA ICS 61800-2 - Adjustable Speed Electrical Power Drive Systems, Part 2: General Requirements-Rating Specifications for Low Voltage Adjustable Frequency AC Power Drive Systems 2005.
- J. NEMA MG 1 - Motors and Generators 2018.
- K. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
- L. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. UL 508A - Industrial Control Panels Current Edition, Including All Revisions.
- N. UL 61800-5-1 - Standard for Adjustable Speed Electrical Power Drive Systems - Part 5-1: Safety Requirements – Electrical, Thermal, and Energy Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
    - 1. Coordinate work to provide motor controllers suitable for use with actual motors to be installed.
    - 2. Coordinate work to provide controllers and associated wiring suitable for interface with control devices to be installed.
    - 3. Coordinate arrangement with dimensions and clearance requirements of actual equipment to be installed.
-



4. Verify with manufacturer that conductor terminations are suitable for use with conductors to be installed.
5. Notify Architect/Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for motor controllers, enclosures, overcurrent protective devices, and other installed components and accessories.
- C. Shop Drawings: Indicate dimensions, voltage, controller sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
  1. Include wiring diagrams showing factory and field connections.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- E. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
  1. Include contact information for entity providing contract maintenance and trouble call-back service.
- F. Executed Warranty: Submit documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- G. Maintenance Materials: Furnish following for Owner's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Air Filters: Two of each different type.

### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
  1. Authorized service facilities located within 200 miles of project site.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store in clean, dry space. Maintain factory wrapping or provide additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to internal components, enclosure, and finish.

### **1.08 FIELD CONDITIONS**

- A. Maintain field conditions within required service conditions during and after installation.

### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide minimum 18 month manufacturer warranty covering repair or replacement due to defective materials or workmanship.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. ABB: [www.abb.com/#sle](http://www.abb.com/#sle).
- B. Square D.



- C. Yaskawa Electric Corp.
- D. Substitutions: See Section 01 6000 - Product Requirements.
- E. Source Limitations: Furnish variable-frequency motor controllers and associated components produced by a single manufacturer and obtained from a single supplier.

## 2.02 VARIABLE-FREQUENCY MOTOR CONTROLLERS

- A. Provide variable-frequency motor control system consisting of required controller assemblies, operator interfaces, control power transformers, instrumentation and control wiring, sensors, accessories, system programming, etc. as necessary for complete operating system.
- B. Provide products listed, classified, and labeled as suitable for purpose intended.
- C. Variable-Frequency Motor Controller:
  - 1. Configuration: Packaged controller with across-the-line bypass.
  - 2. Rectifier/Converter: Diode-based, 6-pulse type.
  - 3. Control Method: Vector; closed-loop, with feedback.
  - 4. Filtering: Provide input/line reactor and output/load reactor.
- D. Controller Assemblies: Comply with NEMA ICS 7, NEMA ICS 7.1, and NEMA ICS 61800-2; list and label as complying with UL 61800-5-1 or UL 508A as applicable.
- E. Provide controllers selected for actual installed motors and coupled mechanical loads in accordance with NEMA ICS 7.2, NEMA MG 1 Part 30, and recommendations of manufacturers of both controller and load, where not in conflict with specified requirements; considerations include, but are not limited to:
  - 1. Motor type (e.g., induction, reluctance, and permanent magnet); consider NEMA MG 1 design letter or inverter duty rating for induction motors.
  - 2. Motor load type (e.g., constant torque, variable torque, and constant horsepower); consider duty cycle, impact loads, and high inertia loads.
  - 3. Motor nameplate data.
  - 4. Requirements for speed control range, speed regulation, and braking.
  - 5. Motor suitability for bypass starting method, where applicable.
- F. Devices on Load Side of Controller: Suitable for application across full controller output frequency range.
- G. Operating Requirements:
  - 1. Input Voltage Tolerance: Plus/minus 10 percent of nominal.
  - 2. Input Frequency Tolerance: Plus/minus 5 percent of nominal.
  - 3. Efficiency: Minimum of 96 percent at full speed and load.
  - 4. Input Displacement Power Factor: Minimum of 0.96 throughout speed and load range.
  - 5. Overload Rating:
    - a. Variable Torque Loads: Minimum of 110 percent of nominal for 60 seconds.
    - b. Constant Torque Loads: Minimum of 150 percent of nominal for 60 seconds.
- H. Power Conversion System: Microprocessor-based, pulse width modulation type consisting of rectifier/converter, DC bus/link, and inverter.
  - 1. Rectifier/Converter: Diode-based, 6-pulse type unless otherwise indicated.
- I. Control System:
  - 1. Provide microprocessor-based control system for automatic control, monitoring, and protection of motors. Include sensors, wiring, and connections necessary for functions and status/alarm indications specified.
  - 2. Provide integral operator interface for controller programming, display of status/alarm indications, fault reset, and local control functions including motor run/stop, motor forward/reverse selection, motor speed increase/decrease, and local/remote control selection.



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3. Control Functions:
    - a. Control Method: Selectable vector and scalar/volts per hertz unless otherwise indicated.
      - 1) Scalar/Volts per Hertz Control: Provide IR compensation for improved low-speed torque.
      - 2) Vector Control: Provide selectable autotuning function.
    - b. Adjustable acceleration and deceleration time; linear and S-curve ramps; selectable coast to stop.
    - c. Selectable braking control; DC injection or flux braking.
    - d. Adjustable minimum/maximum speed limits.
    - e. Adjustable pulse width modulation switching carrier frequency.
    - f. Adjustable motor slip compensation.
    - g. Selectable autorestart after noncritical fault; programmable number of time delay between restart attempts.
  4. Status Indications:
    - a. Motor run/stop status.
    - b. Motor forward/reverse status.
    - c. Local/remote control status.
    - d. Output voltage.
    - e. Output current.
    - f. Output frequency.
    - g. DC bus voltage.
    - h. Motor speed.
    - i. Elapsed run time.
    - j. Discrete input/output status.
    - k. Analog input/output values.
  5. Protective Functions/Alarm Indications:
    - a. Overcurrent.
    - b. Motor overload.
    - c. Undervoltage.
    - d. Overvoltage.
    - e. Controller overtemperature.
    - f. Input/output phase loss.
    - g. Output short circuit protection.
    - h. Output ground fault protection.
  6. Inputs:
    - a. Digital Input(s): Three.
    - b. Analog Input(s): Two.
  7. Outputs:
    - a. Analog Output(s): One.
    - b. Relay Output(s): Two.
  8. Communications: Compatible with connected systems. Provide accessories necessary for proper interface.
    - a. Serial Communications: RS-485; support for Modbus RTU protocol.
    - b. Ethernet Communications: Support for Modbus TCP protocol.
  9. Features:
    - a. Password-protected security access.
    - b. Event log.
  - J. Power Conditioning/Filtering:
    1. Provide DC link choke or input/line reactor for each controller unless otherwise indicated or required.
    2. Reactor Impedance: 3 percent, unless otherwise indicated or required.
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- K. Packaged Controllers: Controllers factory-mounted in separate enclosure with externally operable disconnect and specified accessories.
1. Disconnects: Circuit breaker or disconnect switch type.
    - a. Disconnect Switches: Fusible type or nonfusible type with separate input fuses.
    - b. Provide externally operable handle with means for locking in OFF position. Provide safety interlock to prevent opening cover with disconnect in ON position with capability of overriding interlock for testing purposes.
    - c. Provide auxiliary interlock for disconnection of external control power sources where applicable.
  2. Provide door-mounted remote operator interface.
  3. Packaged Controllers with Bypass: Provide contactors and controls to enable removal of variable-frequency controller from circuit.
    - a. Bypass Method: Manual, unless otherwise indicated.
    - b. Bypass Configuration: 3-contactor type, with contactors for bypass, drive output, and drive input.
    - c. Bypass Motor Starting Method: Full-voltage (across-the-line) with overload relay, unless otherwise indicated or required.
    - d. Overload Relays: Solid state or bimetallic thermal type.
  4. Pilot Devices Required:
    - a. Furnish local pilot devices for each unit as specified below unless otherwise indicated on drawings, except where equivalent function is provided by remote operator interface.
    - b. Packaged Controllers with Bypass:
      - 1) Bypass Mode Selector Switch: DRIVE/OFF/BYPASS.
      - 2) Motor Control Selector Switch: HAND/OFF/AUTO.
      - 3) Indicating Lights: For drive/bypass mode status, drive/bypass run status, and drive/bypass fault status.
- L. Service Conditions:
1. Provide controllers and associated components suitable for operation under following service conditions without derating:
    - a. Altitude: Less than 3,300 feet.
    - b. Ambient Temperature: Between 32 degrees F and 104 degrees F.
  2. Provide controllers and associated components suitable for operation at indicated ratings under service conditions at installed location.
- M. Short Circuit Current Rating:
1. Provide controllers with listed short circuit current rating not less than available fault current at installed location as determined by short circuit study performed in accordance with Section 26 0573.
  2. Provide line/input reactors where specified by manufacturer for required short circuit current rating.
- N. Conductor Terminations: Suitable for use with conductors to be installed.
- O. Enclosures:
1. Comply with NEMA ICS 6.
  2. NEMA 250 Environment Type or Equivalent IEC 60529 Rating: Unless otherwise indicated, as specified for following installation locations:
    - a. Outdoor Locations: Type 3R or Type 4.
  3. Finish: Manufacturer's standard unless otherwise indicated.
  4. Cooling: Forced air or natural convection as determined by manufacturer.
  5. Enclosure Space Heaters:
    - a. Provide in each controller enclosure installed outdoors and in unconditioned indoor spaces.
-



- b. Size according to manufacturer's recommendations for worst case ambient temperature to prevent condensation.
- c. Heater Control: Thermostat.
- d. Heater Power Source: Provide connection to transformer factory-installed in enclosure or suitable external branch circuit as indicated or as required.

## **2.03 OVERCURRENT PROTECTIVE DEVICES**

- A. Overload Relays:
  - 1. Provide overload relays and, where applicable, associated current elements/heaters selected for actual installed motor nameplate data, in accordance with manufacturer's recommendations and NFPA 70; include consideration for motor service factor and ambient temperature correction, where applicable.
  - 2. Comply with NEMA ICS 2.
  - 3. Inverse-Time Trip Class Rating: Class 20 unless otherwise indicated or required.
  - 4. Trip-free operation.
  - 5. Visible trip indication.
  - 6. Resettable:
    - a. Employ manual reset unless otherwise indicated.
    - b. Do not employ automatic reset with two-wire control.

## **2.04 ACCESSORIES**

- A. Auxiliary Contacts:
  - 1. Comply with NEMA ICS 5.
  - 2. Provide number and type of contacts indicated or required to perform necessary functions, including holding (seal-in) circuit and interlocking, plus one normally open (NO) and one normally closed (NC) spare contact for each bypass motor starter, minimum.
- B. Pilot Devices:
  - 1. Comply with NEMA ICS 5; heavy-duty type.
  - 2. Pushbuttons: Unless otherwise indicated, provide momentary, nonilluminated type with flush button operator; normally open or normally closed as indicated or as required.
  - 3. Selector Switches: Unless otherwise indicated, provide maintained, nonilluminated type with knob operator; number of switch positions as indicated or as required.
  - 4. Indicating Lights: Push-to-test type unless otherwise indicated.
  - 5. Provide LED lamp source for indicating lights and illuminated devices.
- C. Control and Timing Relays:
  - 1. Comply with NEMA ICS 5.
  - 2. Provide number and type of relays indicated or required to perform necessary functions.
- D. Control Power Transformers:
  - 1. Size to accommodate burden of contactor coil(s) and connected auxiliary devices.
  - 2. Include primary and secondary fuses.

## **2.05 SOURCE QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Factory test controllers in accordance with NEMA ICS 61800-2.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that ratings of controllers are consistent with indicated requirements.
- C. Verify that mounting surfaces are ready to accept controllers.
- D. Verify that conditions are satisfactory for installation prior to starting work.



**3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install in accordance with NEMA ICS 7.1 and manufacturer's instructions.
- C. Do not exceed manufacturer's recommended maximum cable length between controller and motor.
- D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- E. Provide required support and attachment in accordance with Section 23 0529.
- F. Install controllers plumb and level.
- G. Provide grounding and bonding in accordance with Section 26 0526.
- H. Install field-installed devices, components, and accessories.
- I. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
- J. Set field-adjustable settings of controllers and associated components according to installed motor requirements, in accordance with recommendations of manufacturers of controller and load.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.17. Insulation-resistance test on control wiring listed as optional is not required.
- D. Packaged Controllers with Bypass: Test for proper operation in both drive and bypass modes.
- E. Test for proper interface with other systems.
- F. Correct deficiencies and replace damaged or defective controllers or associated components.

**3.04 ADJUSTING**

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

**3.05 CLEANING**

- A. Clean dirt and debris from controller enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

**3.06 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
  - B. See Section 01 7900 - Demonstration and Training, for additional requirements.
  - C. Demonstration: Demonstrate proper operation of controllers to Owner, and correct deficiencies or make adjustments as directed.
  - D. Training: Train Owner's personnel on operation, adjustment, and maintenance of controllers and associated devices.
    - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
    - 2. Provide minimum of two hours of training.
    - 3. Location: At project site.
-



**3.07 PROTECTION**

- A. Protect installed controllers from subsequent construction operations.

**3.08 MAINTENANCE**

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

**END OF SECTION**



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**SECTION 23 0993**  
**SEQUENCE OF OPERATIONS FOR HVAC CONTROLS**  
**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section includes control sequences for HVAC systems, subsystems and equipment.

**1.02 DEFINITIONS**

- A. DDC: Direct digital control.  
B. DW: Desiccant wheel.  
C. ERW: Total energy recovery wheel.  
D. VAV: Variable air volume.  
E. BAS: Building automation system; EMS: Energy management system.

**PART 2 PRODUCTS (NOT APPLICABLE)**

**PART 3 EXECUTION**

**3.01 HVAC CONTROL SEQUENCES**

- A. General
1. All set points shall be adjustable.
  2. Coordinate with Owner on required system alarms.
  3. Obtain building occupancy schedules from Owner.
  4. Alarms shall be configured as status only or critical. Status only alarms shall display alarm on the Owner coordinated workstation(s) and device(s). Critical alarms shall incorporate coordinated unit shutdown along with displaying alarms on the Owner coordinated devices and require the alarm to be cleared prior to restarting the equipment.
  5. HVAC equipment shall operate in occupied/unoccupied modes as determined by the DDC building time clock system. Obtain the building occupancy schedule from the Owner.
  6. All equipment shall utilize optimum start/stop programs.
  7. Unoccupied override buttons shall place the space equipment in occupied mode for a period of one-hour (adjustable).
  8. Assign each RTU a stagger start number to keep too many units from starting at the same time. In effect, this flattens load peaks. This includes start-up on emergency power.
  9. Outside air and return air dampers shall never be simultaneously closed. In unoccupied modes, the return air damper shall be full open and shall only modulate closed as the outdoor air damper modulates open to provide makeup for spaces that are exhausted.

**3.02 ROOF TOP UNIT (PHS-RTU-1&2) AND ASSOCIATED SPACE EQUIPMENT AND DUCTWORK SYSTEM:**

- A. All Occupied Modes as determined by space occupancy sensor:
1. Unit Supply Fan:
    - a. Run continuously.
  2. Unit Exhaust Fan:
    - a. Run continuously.
  3. Outside Air Damper:
    - a. Open to maintain outside air quantity as scheduled, outside air damper shall never be positioned below this minimum except in case of emergency.
    - b. Modulate outside air damper beyond scheduled minimum position as follows:
      - 1) As required for economizer cooling (see cooling mode below).
  4. Exhaust Air Damper:
    - a. Modulate with outside air damper to maintain following air balance:  $EXH\ CFM = SA\ CFM - OA\ CFM$ .
-



- 
- B. Occupied Heating Mode – space temperature below set point.
    - 1. Duct mounted heating coil, HC-1/2 (in existing fan room): Modulate coil control valve (CV) to maintain space temperature set point.
    - 2. Space Temperature Set Points:
      - a. Heating = 69 degrees (adjustable).
    - 3. LAT Temperature Set Points:
      - a. Minimum temperature reset schedule:
        - 1) 65 degree LAT at 0 degree OAT.
        - 2) 55 degree LAT at 55 degree OAT.
  - C. Occupied Cooling Mode – space temperature below set point. – where applicable
    - 1. Unit mounted DX cooling coil: Modulate DX compressor to maintain space temperature set point.
    - 2. Space Temperature Set Points:
      - a. Cooling = 75 degrees (adjustable).
    - 3. LAT Temperature Set Points:
      - a. Cooling = 55 degree LAT at 88 degree OAT
  - D. Occupied Economizer Cooling Mode – when there is call for cooling and the outdoor air temperature is below the space temperature.
    - 1. Economizer cooling set point: 74°F.
  - E. All Unoccupied Modes determined by occupancy sensors:
    - 1. Space Temperature Set Points:
      - a. Heating = 60 degrees.
      - b. Cooling = 85 degrees.
      - c. There shall be a 5 degree deadband for heating and cooling set points.
    - 2. Heating Coil HC-1/2 (in existing fan room):
      - a. All same as occupied mode with following exceptions:
        - 1) Enable and disable unit only to meet temperature set point.
        - 2) Disable exhaust fan.
        - 3) Open recirculation damper.
  - F. Warm-up Mode.:
    - 1. All units shall start per optimum start program.
      - a. Optimum start duration shall be determined based on outside air temperature.
      - b. During the optimum start period, the heating set-point shall be linearly ramped up from unoccupied heating set-point to occupied heating set point.
    - 2. Systems shall operate as described in unoccupied heating mode with temperature set point equal to occupied mode.
  - G. Alarms – Provide an alarm for each of the following:
    - 1. Fan motor failures.
    - 2. Discharge Air Temperature low/high limits.
    - 3. Space Temperature low/high limits +/-5°F.
    - 4. VFD Fault.

### **3.03 ROOF TOP UNIT (PHS-RTU-3&4) AND ASSOCIATED SPACE EQUIPMENT AND DUCTWORK SYSTEM:**

- A. All Occupied Modes:
    - 1. Unit Supply Fan:
      - a. Run continuously.
    - 2. Unit Exhaust Fan:
      - a. Run continuously.
    - 3. Outside Air Damper:
-



SEQUENCE OF OPERATIONS  
FOR HVAC CONTROLS

- 
- a. Open to maintain outside air quantity as scheduled, outside air damper shall never be positioned below this minimum except in case of emergency.
    - b. Modulate outside air damper beyond scheduled minimum position as follows:
      - 1) As required for economizer cooling (see cooling mode below).
  - 4. Exhaust Air Damper:
    - a. Modulate with outside air damper to maintain following air balance:  $EXH\ CFM = SA\ CFM - OA\ CFM$ .
  - B. Occupied Heating Mode – space temperature below set point.
    - 1. Duct mounted heating coil, PHS-HC-3/4 (in existing fan room): Modulate coil control valve (CV) to maintain space temperature set point.
    - 2. Space Temperature Set Points:
      - a. Heating = 69 degrees (adjustable).
    - 3. LAT Temperature Set Points:
      - a. Minimum temperature reset schedule:
        - 1) 65 degree LAT at 0 degree OAT.
        - 2) 55 degree LAT at 55 degree OAT.
  - C. Occupied Cooling Mode – space temperature below set point. – where applicable
    - 1. Unit mounted DX cooling coil: Modulate DX compressor to maintain space temperature set point.
    - 2. Space Temperature Set Points:
      - a. Cooling = 75 degrees (adjustable).
    - 3. LAT Temperature Set Points:
      - a. Cooling = 55 degree LAT at 88 degree OAT
  - D. Occupied Economizer Cooling Mode – when there is call for cooling and the outdoor air temperature is below the space temperature.
    - 1. Economizer cooling set point: 74°F.
  - E. All Unoccupied Modes:
    - 1. Space Temperature Set Points:
      - a. Heating = 60 degrees.
      - b. Cooling = 85 degrees.
      - c. There shall be a 5 degree deadband for heating and cooling set points.
    - 2. Heating Coil PHS-HC-1/2 (in existing fan room):
      - a. All same as occupied mode with following exceptions:
        - 1) Enable and disable unit only to meet temperature set point.
        - 2) Disable exhaust fan.
        - 3) Open recirculation damper.
  - F. Warm-up Mode.:
    - 1. All units shall start per optimum start program.
      - a. Optimum start duration shall be determined based on outside air temperature.
      - b. During the optimum start period, the heating set-point shall be linearly ramped up from unoccupied heating set-point to occupied heating set point.
    - 2. Systems shall operate as described in unoccupied heating mode with temperature set point equal to occupied mode.
  - G. Alarms – Provide an alarm for each of the following:
    - 1. Fan motor failures.
    - 2. Discharge Air Temperature low/high limits.
    - 3. Space Temperature low/high limits +/-5°F.
    - 4. VFD Fault.
-



**3.04 EXHAUST FAN (TOILET ROOMS):**

- A. All Occupied Modes as determined by space occupancy sensor:
  - 1. Unit Fan:
    - a. Open damper and enable fan after 15 second delay
    - b. Occupied override button:
      - 1) Run continuously as determined by building occupied time clock.
- B. All Unoccupied Modes as determined by space occupancy:
  - 1. Unit Fan:
    - a. Command unoccupied mode after 15 minute delay (adjustable) as determined by the space occupancy sensor.
    - b. Disable fan and modulate damper to full closed position after 15 second delay
    - c. Unoccupied override button:
      - 1) Disable fan as determined by building unoccupied time clock.
- C. Alarms:
  - 1. Fan fails after 30 seconds of being commanded on.
  - 2. Fan fails to stop after 30 seconds of being commanded off.

**3.05 UNIT HEATERS (CUH):**

- A. Occupied heating mode: Command fan and modulate the control valve to maintain space temperature set point of 69°F – adjustable.
- B. Un-Occupied heating mode: Command fan and modulate the control valve to maintain space temperature set point of 65°F – adjustable.
- C. Cooling mode: Command fan to off.
- D. Alarms:
  - 1. High/low space temperature.
  - 2. Dirty filter
  - 3. Fan failure

**3.06 FIN-TUBE AND CONVECTORS:**

- A. Occupied heating mode: Modulate control valve to maintain space temperature set point of 69°F – adjustable.
- B. Un-Occupied heating mode: Modulate control valve to maintain space temperature set point of 65°F – adjustable.
- C. Cooling mode: Modulate control valve to full closed position.
- D. Alarms:
  - 1. High/low space temperature.

**3.07 STEAM BOILER SYSTEM - LEAD LAG-SEQUENCING**

- A. Enable boiler system at outdoor air temperatures below 55°F. 1-hour minimum changeover time. Boilers shall not be commanded on until building heating hot water circulation pumps are proven on.
  - B. Zone Control valves
    - 1. On a call for heat the corresponding zone valve shall open.
    - 2. Alarms
      - a. Boiler alarm.
      - b. High CO or CH<sub>4</sub>. Shutdown if either of these rise to unsafe levels.
      - c. High/low boiler discharge temp.
      - d. High/low building supply temp.
-



- C. Boilers are to be taken from cold stand-by to low fire condition by the control system. Boilers are to be shut down by the control system
- D. As the process pressure varies from set point, the controls shall enable additional boilers to be used to satisfy the load/demand, or remove boilers as the load decreases. The sequence for the boilers to come on or off line shall be selectable. An adjustable time delay (0 to 50 minutes) shall be utilized and compared to the process variable before bringing another boiler on or off line.
- E. On/Off sequencing shall control the plant master steam pressure set point.
- F. Supply a gauge pressure transmitter for the plant header steamline with 4-20 ma input to the controller. Pressure transmitter shall be 4-wire type or be furnished with a 24 V loop power supply (C1). It shall sense the steam pressure directly with a capsule that is inside the transmitter enclosure. The Pressure set point range shall be 5 to 7 psig.
- G. Sequencer shall have retentive memory in case of power failure and shall recall the last operating sequence and number of boilers in service when power is restored.
- H. Auto Lead Boiler Changeover shall be front panel programmable for either of the following, accumulated lead boiler run hours, day/hour changeover time.
- I. Provide outside air temperature reset control action. Include a temperature transmitter with 4-20 ma signal to the controller. The controller will reset the set points based on the variations in the outside air temperature.
- J. Provide automatic sequencing upon boiler failure that shall enable another boiler to be brought into sequence in the event of flame failure of an on-line boiler.
- K. Provide the RS-485 output and programming of the controller to permit remote changes of control commands from the building management system.
- L. Provide combustion efficiency reading for each boiler and based upon boiler flue gas temperature. For this, provide one flue gas temperature transmitter for each boiler with a stainless steel protected 18-inch insertion 100 ohm platinum RTD and a dedicated digital flue gas temp indicator mounted on the cabinet front for each transmitter.

**SECTION 230993****END OF SECTION**



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**SECTION 23 1113  
FACILITY FUEL-OIL PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Piping and fittings.
- B. Flanges and piping components.
- C. Pipe hangers and supports.
- D. Valves.
- E. Strainers.
- F. Flexible connectors.
- G. Fuel oil pumps.
- H. Transfer system.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 09 9123 - Interior Painting.
- C. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL.
- D. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

**1.03 REFERENCE STANDARDS**

- A. API Spec 5L - Line Pipe 2018, with Errata.
- B. API RP 1615 - Installation of Underground Petroleum Storage Systems 2011 (Reaffirmed 2020).
- C. ASME BPVC - Boiler and Pressure Vessel Code 2021.
- D. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators 2021.
- E. ASME B1.1 - Unified Inch Screw Threads (UN, UNR, and UNJ Thread Forms) 2019.
- F. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 2021.
- G. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard 2020.
- H. ASME B16.11 - Forged Fittings, Socket-Welding and Threaded 2016, with Errata (2017).
- I. ASME B16.12 - Cast Iron Threaded Drainage Fittings 2019.
- J. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- K. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2018.
- L. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes 2018.
- M. ASME B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series) 2012 (Reaffirmed 2021).
- N. ASME B18.2.2 - Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series) 2015.
- O. ASME B31.1 - Power Piping 2020.
- P. ASME B31.3 - Process Piping 2020.
- Q. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.



- R. ASTM A182/A182M - Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service 2021.
- S. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings 2017.
- T. ASTM B75/B75M - Standard Specification for Seamless Copper Tube 2020.
- U. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2020.
- V. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.
- W. ASTM D229 - Standard Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation 2019, with Editorial Revision.
- X. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding 2019.
- Y. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).
- Z. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves 2019.
- AA. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .
- BB. NACE SP0286 - Electric Isolation of Cathodically Protected Pipelines 1997 (Reaffirmed 2007).

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Shop Drawings: Indicate tanks, system layout, pipe sizes, location, and elevations. For fuel oil tanks, indicate dimensions and accessories, including manholes and hold down straps.
- D. Certificates: Certify that products meet or exceed specified requirements.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Welding Materials and Procedures: Comply with ASME BPVC.
- B. Welders Certification: In accordance with ASME BPVC-IX.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- D. Valves: Manufacturer's name and pressure rating marked on valve body.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for [\_\_\_\_\_].

### **PART 2 PRODUCTS**

#### **2.01 PIPING AND FITTINGS**

- A. Regulatory Requirements:
  - 1. Comply with the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
  - 2. Comply with ASME B31.1 for installation of fuel oil piping.
- B. Comply with the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.



- C. Carbon Steel Pipe:
  - 1. Comply with One of the Following:
    - a. ASTM A53/A53M, Type E or S, Grade B, seamless or electric welded, Schedule 80 for pipe less than 2-1/2 inches in diameter or Schedule 40 for pipe 2-1/2 inches in diameter and larger.
    - b. API Spec 5L, Product Specification Level (PSL) 1, Grade B, submerged-arc welded or gas metal-arc welded.
  - 2. End Connections:
    - a. Forged, socket weld type, complying with ASTM A182/A182M and ASME B16.11 for pipe or fittings less than 2-1/2 inches.
    - b. Threaded type complying with ASME B16.3, Class 150 or ASME B16.11.
- D. Copper Pipe: Type K.
  - 1. Comply with ASTM B88 and ASTM B88M.
  - 2. Fittings and End Connections:
    - a. Wrought Copper and Bronze Solder-Joint Pressure Fittings: Comply with ASME B16.22 and ASTM B75/B75M.
    - b. Cast Copper Alloy Solder-Joint Pressure Fittings: Comply with ASME B16.18.
    - c. Cast Copper Alloy Fittings for Flared Copper Tube: Comply with ASME B16.26 and ASTM B62.
    - d. Brass or bronze adapters for brazed tubing acceptable for connecting tubing to flanges and threaded ends of valves and equipment.
    - e. Extracted brazed tee joints acceptable if produced with acceptable tool and installed in accordance with manufacturer's recommendations.
  - 3. Brazing Filler Metal:
    - a. Filler metal to comply with AWS A5.8M/A5.8, Type Bag-5 with AWS Type 3 flux.
    - b. Type BCuP-5 or BCuP-6 acceptable for brazing copper-to-copper joints.

## **2.02 FLANGES, COUPLINGS, AND PIPING COMPONENTS**

- A. Flanges:
  - 1. Provide flanged end connections on equipment, fittings, piping, piping components, adapters, couplings, and valves complying with ASME B16.5, Class 150.
  - 2. Gaskets, Non-Isolating:
    - a. 1/8 inch thick.
    - b. Comply with ASME B16.12, raised-faced type.
    - c. Material: Buna-N.
  - 3. Gaskets, Electrically Isolating:
    - a. Comply with ASTM D229.
    - b. Electrical Insulating Material: 1000 ohms resistance.
    - c. Chemically compatible with fuel handled.
    - d. Full face type.
    - e. Provide full surface, spiral-wound, mylar, insulating sleeves between bolts and holes of flanges.
    - f. Furnish bolt shank diameter not less than diameter at root of threads.
    - g. Provide high-strength 1/8 inch thick, phenolic, insulating washers next to flanges with flat, circular, stainless steel washers over the insulating and under bolt heads and nuts.
    - h. Supply adequate bolt length to accommodate insulating gaskets and stainless steel washers.
  - 4. Bolts, Nuts, and Washers:
    - a. Comply with ASME B18.2.1 and ASME B18.2.2.
    - b. Bolts:
      - 1) Regular hexagonal type.



- 2) Threaded in accordance with ASME B1.1, Class 2A fit, Coarse Thread Series, for sizes 1 inch and smaller and Eight-Pitch Thread Series for sizes larger than 1 inch.
- 3) Provide sufficient length to obtain full bearing on nuts, projecting no more than two full threads beyond nuts with bolts tightened to required torque.
- c. Nuts:
  - 1) Hexagonal, heavy series type.
  - 2) Threaded in accordance with ASME B1.1, Class 2B fit, Coarse Thread Series for sizes 1 inch and smaller and Eight-Pitch Thread Series for sizes larger than 1 inch.
- B. Piping Components:
  1. Provide components that meet the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
  2. Pressure Design Class: Class 150, as defined in ASME B16.5.

### 2.03 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
  1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
- B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
- C. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

### 2.04 BALL VALVES

- A. Manufacturers:
  1. Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
  2. Nibco, Inc; [ ]: [www.nibco.com/#sle](http://www.nibco.com/#sle).
  3. Milwaukee Valve Company; [ ]: [www.milwaukeevalve.com/#sle](http://www.milwaukeevalve.com/#sle).
  4. Viega LLC; [ ]: [www.viega.us/#sle](http://www.viega.us/#sle).
- B. MSS SP-110, Class 150, 400 psi CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder.

### 2.05 SWING CHECK VALVES

- A. Manufacturers:
  1. Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
  2. Hammond Valve; [ ]: [www.hammondvalve.com/#sle](http://www.hammondvalve.com/#sle).
  3. Nibco, Inc; [ ]: [www.nibco.com/#sle](http://www.nibco.com/#sle).
  4. Milwaukee Valve Company; [ ]: [www.milwaukeevalve.com/#sle](http://www.milwaukeevalve.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. MSS SP-80, Class 125, bronze body and cap, bronze swing disc, solder ends.

### 2.06 RELIEF VALVES

- A. Manufacturers:
  1. Armstrong International, Inc; [ ]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  2. ITT McDonnell & Miller; [ ]: [www.mcdonnellmiller.com/#sle](http://www.mcdonnellmiller.com/#sle).
  3. Spirax-Sarco; [ ]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
  4. [ ].
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated at maximum 60 psi, UL listed for fuel oil, capacities ASME certified and labelled.



## 2.07 STRAINERS

- A. Manufacturers:
  - 1. Armstrong International, Inc; [ ]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  - 2. Green Country Filter Manufacturing; [ ]: [www.greencountryfilter.com/#sle](http://www.greencountryfilter.com/#sle).
  - 3. WEAMCO; [ ]: [www.weamco.com/#sle](http://www.weamco.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.

## 2.08 FLEXIBLE CONNECTORS

- A. Manufacturers:
  - 1. Circuit Hydraulics, Ltd; [ ]: [www.circuit-hydraulics.co.uk](http://www.circuit-hydraulics.co.uk).
  - 2. Flexicraft Industries; [ ]: [www.flexicraft.com/#sle](http://www.flexicraft.com/#sle).
  - 3. Penflex; [ ]: [www.penflex.com/#sle](http://www.penflex.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Bronze inner hose and braided exterior sleeve, suitable for minimum 200 psi CWP and 250 degrees F.

## 2.09 FUEL OIL PUMPS

- A. Manufacturers:
  - 1. Simplex, Inc; [ ]: [www.simplexdirect.com/#sle](http://www.simplexdirect.com/#sle).
  - 2. Suntec; [ ]: [www.suntecpumps.com/#sle](http://www.suntecpumps.com/#sle).
  - 3. Viking Pump, Inc; [ ]: [www.vikingpump.com/#sle](http://www.vikingpump.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Casing: Bronze, rated for 125 psi working pressure with integral pressure relief valve.
- C. Drive: Direct connected with flexible coupling.
- D. Accessories: Adjustable pressure control valve, bleed valve, mechanical seal.

## 2.10 TRANSFER SYSTEM

- A. System: Float valves and relays to energize transfer pumps to fill day tank from main storage tank automatically.
  - 1. Low level: Energize pumps when tank level drops below 50 percent of full volume.
  - 2. Full level: De-energize pumps when full.
  - 3. Alarm: Sound audible alarm when fuel overflows into return line.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that excavations are to required grade, are dry, and have not been over-excavated.

### 3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Excavate In Accordance With:
- E. Backfill in Accordance With:

### 3.03 PIPING INSTALLATION

- A. Install in accordance with manufacturer's instructions and API RP 1615.
  - B. Provide non-conducting dielectric connections wherever jointing dissimilar metals. Install to NACE SP0286.
  - C. Route piping in orderly manner and maintain gradient.
-



- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance for installation of insulation and access to valves and fittings.
- G. Install firestopping to preserve fire-resistance rating of partitions and other elements.
- H. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting. See Section 09 9123.
- I. Install valves with stems upright or horizontal, not inverted.
- J. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

**END OF SECTION**



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## **SECTION 23 1123 FACILITY NATURAL-GAS PIPING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Pipe, pipe fittings, valves, and connections for natural gas piping systems.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 09 9123 - Interior Painting.
- B. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL.

#### **1.03 REFERENCE STANDARDS**

- A. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators 2021.
- B. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 2021.
- C. ASME B31.1 - Power Piping 2020.
- D. ASME B31.9 - Building Services Piping 2020.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- F. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service 2019.
- G. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube 2016.
- H. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings 2016.
- I. MSS SP-78 - Gray Iron Plug Valves, Flanged and Threaded Ends 2011.
- J. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Welders' Certificates: Submit certification of welders' compliance with ASME BPVC-IX.
- D. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.
- D. Welder Qualifications: Certified in accordance with ASME BPVC-IX.

### **PART 2 PRODUCTS**

#### **2.01 NATURAL GAS PIPING, ABOVE GRADE**

- A. Steel Pipe: ASTM A53/A53M, Schedule 40 black.
  - 1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
  - 2. Joints: Threaded or welded to ASME B31.1.



3. Mechanical Press Sealed Fittings: Double pressed type and approved or certified, utilizing EPDM, non toxic synthetic rubber sealing elements.
  - a. Manufacturers:
    - 1) Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
    - 2) Viega LLC; MegaPress: [www.viega.us/#sle](http://www.viega.us/#sle).
    - 3) Substitutions: See Section 01 6000 - Product Requirements.

## 2.02 BALL VALVES

- A. Manufacturers:
  1. Apollo Valves; [ ]: [www.apollovalves.com/#sle](http://www.apollovalves.com/#sle).
  2. Grinnell Products; [ ]: [www.grinnell.com/#sle](http://www.grinnell.com/#sle).
  3. Milwaukee Valve Company; [ ]: [www.milwaukeevalve.com/#sle](http://www.milwaukeevalve.com/#sle).
  4. Nibco, Inc; [ ]: [www.nibco.com/#sle](http://www.nibco.com/#sle).
  5. Viega LLC; [ ]: [www.viega.us/#sle](http://www.viega.us/#sle).
  6. Uponor, Inc; [ ]: [www.uponorpro.com/#sle](http://www.uponorpro.com/#sle).
- B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze, ductile iron, or [ ] body, 304 stainless steel, chrome plated brass, or [ ] ball, regular port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder, threaded, grooved, or [ ] ends with union.

## 2.03 PLUG VALVES

- A. Construction 2-1/2 Inches and Larger: MSS SP-78, 175 psi CWP, cast iron body and plug, pressure lubricated, Teflon or Buna N packing, flanged or grooved ends. Provide lever operator with set screw.

## 2.04 STRAINERS

- A. Size 2 inch and Under:
  1. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
  2. Class 150, threaded bronze body 300 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
- B. Size 1-1/2 inch to 4 inch:
  1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

### 3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- C. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- D. Group piping whenever practical at common elevations.
- E. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- F. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting.



1. Painting of interior piping systems and components is specified in Section 09 9123.
- G. Install valves with stems upright or horizontal, not inverted.
- H. Pipe vents from gas pressure reducing valves to outdoors and terminate in weather proof hood.
- I. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813.
- J. Sleeve pipes passing through partitions, walls and floors.
- K. Pipe Hangers and Supports:
  1. Install in accordance with ASME B31.9.
  2. Support horizontal piping as indicated.
  3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  4. Place hangers within 12 inches of each horizontal elbow.
  5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  7. Provide copper plated hangers and supports for copper piping.
  8. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

### 3.04 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Install ball valves for throttling, bypass, or manual flow control services.
- E. Provide plug valves in natural gas systems for shut-off service.

### 3.05 SCHEDULES

- A. Pipe Hanger Spacing:
  1. Metal Piping:
    - a. Pipe Size: 1/2 inches to 1-1/4 inches:
      - 1) Maximum Hanger Spacing: 6.5 ft.
      - 2) Hanger Rod Diameter: 3/8 inches.
    - b. Pipe Size: 1-1/2 inches to 2 inches:
      - 1) Maximum Hanger Spacing: 10 ft.
      - 2) Hanger Rod Diameter: 3/8 inch.
    - c. Pipe Size: 2-1/2 inches to 3 inches:
      - 1) Maximum Hanger Spacing: 10 ft.
      - 2) Hanger Rod Diameter: 1/2 inch.
    - d. Pipe Size: 4 inches to 6 inches:
      - 1) Maximum Hanger Spacing: 10 ft.
      - 2) Hanger Rod Diameter: 5/8 inch.

**END OF SECTION**



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**SECTION 23 2213**  
**STEAM AND CONDENSATE HEATING PIPING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Pipe and pipe fittings.
- B. Pipe hangers and supports.
- C. Steam piping system.
- D. Steam condensate piping system.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 22 0719 - Plumbing Piping Insulation.
- C. Section 23 0523 - General-Duty Valves for HVAC Piping-CPL.
- D. Section 23 0553 - Identification for HVAC Piping and Equipment-CPL.
- E. Section 23 0719 - HVAC Piping Insulation-CPL.
- F. Section 23 2214 - Steam and Condensate Heating Specialties.
- G. Section 23 2500 - HVAC Water Treatment: Pipe cleaning.

**1.03 REFERENCE STANDARDS**

- A. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 2021.
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2018.
- D. ASME B31.1 - Power Piping 2020.
- E. ASME B31.9 - Building Services Piping 2020.
- F. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings 1999, with Editorial Revision (2018).
- G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- H. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service 2019.
- I. ASTM B32 - Standard Specification for Solder Metal 2020.
- J. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2020.
- K. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2021).
- M. AWWA C606 - Grooved and Shouldered Joints 2015.
- N. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).

**1.04 SUBMITTALS**

- A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.
  - B. Welders Certificate: Include welders certification of compliance with ASME BPVC-IX.
  - C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
-



**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Welder Qualifications: Certified in accordance with ASME BPVC-IX.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labelling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

**PART 2 PRODUCTS****2.01 REGULATORY REQUIREMENTS**

- A. Comply with ASME B31.9 and ASME B31.1 code for installation of piping system.

**2.02 LOW PRESSURE STEAM PIPING (15 PSIG MAXIMUM)**

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black.
  - 1. Fittings: ASME B16.3 malleable iron Class 150, or ASTM A234/A234M wrought steel.
  - 2. Joints: Threaded, or AWS D1.1/D1.1M welded.
- B. Steel Pipe Sizes 12 Inch and Over: ASTM A53/A53M, 3/8 inch wall, black.
  - 1. Fittings: ASTM A234/A234M wrought steel.
  - 2. Joints: Welded in accordance with AWS D1.1/D1.1M.
- C. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn.
  - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22 wrought copper.
  - 2. Joints: Solder, lead free, ASTM B32, HB alloy (95-5 tin-antimony), or tin and silver.

**2.03 LOW PRESSURE STEAM CONDENSATE PIPING**

- A. Steel Pipe: ASTM A53/A53M, Schedule 80, black.
  - 1. Fittings: ASME B16.3 malleable iron Class 150, or ASTM A234/A234M wrought steel.
  - 2. Joints: Threaded, or AWS D1.1/D1.1M welded.
- B. Steel Pipe Sizes 12 Inch and Over: ASTM A53/A53M, 3/8 inch wall, black.
  - 1. Fittings: ASTM A234/A234M wrought steel.
  - 2. Joints: Welded in accordance with AWS D1.1/D1.1M.
- C. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), drawn.
  - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22, wrought copper.
  - 2. Joints: Solder, lead free, ASTM B32, HB alloy (95-5 tin-antimony), or tin and silver.

**2.04 PIPE HANGERS AND SUPPORTS**

- A. Provide hangers and supports that comply with MSS SP-58.
    - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
  - B. Hangers for Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
  - C. Hangers for Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double hanger.
  - D. Multiple or Trapeze Hangers for Pipe Sizes to 4 inches: Steel channels with welded spacers and hanger rods.
  - E. Multiple or Trapeze Hangers for Pipe Sizes 6 Inches and Over: Steel channels with welded spacers and hanger rods; cast iron roll and stand.
  - F. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
-



- G. Wall Support for Pipe Sizes 4 to 5 Inches: Welded steel bracket and wrought steel clamp.
- H. Wall Support for Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll.
- I. Vertical Support: Steel riser clamp.
- J. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
- K. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

## **2.05 UNIONS, FLANGES, AND COUPLINGS**

- A. Unions for Pipe 2 Inches and Under:
  - 1. Ferrous Piping: 150 psig galvanized malleable iron, threaded.
  - 2. Copper Pipe: Bronze, soldered joints.
- B. Flanges for Pipe Over 2 Inches:
  - 1. Ferrous Piping: 150 psig forged steel, slip-on.
  - 2. Copper Piping: Bronze.
  - 3. Gaskets: 1/16 inch thick preformed non-asbestos graphite fiber.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
  - 1. Dimensions and Testing: In accordance with AWWA C606.
  - 2. Housing Material: Provide ASTM A47/A47M malleable iron, ductile iron, or [\_\_\_\_], galvanized.
  - 3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
  - 4. When pipe is field grooved, provide coupling manufacturer's grooving tools.
- D. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Whenever work is suspended during construction protect open ends with temporary plugs or caps.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and avoid interference with use of space.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- E. Pipe Hangers and Supports:
  - 1. Install in accordance with ASME B31.9.
  - 2. Support horizontal piping as indicated.
  - 3. Place hangers within 12 inches of each horizontal elbow.
  - 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.



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- 5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  - 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  - F. Slope steam piping one inch in 40 feet in direction of flow. Use eccentric reducers to maintain bottom of pipe level.
  - G. Slope steam condensate piping one inch in 40 feet. Provide drip trap assembly at low points and before control valves. Run condensate lines from trap to nearest condensate receiver. Provide loop vents over trapped sections.
  - H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
  - I. Prepare unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 9123.
  - J. Install valves with stems upright or horizontal, not inverted.

### 3.03 SCHEDULES

- A. Hanger Spacing for Copper Tubing.
  - 1. 1/2 inch and 3/4 inch: Maximum span, 5 feet; minimum rod size, 1/4 inch.
  - 2. 1 inch: Maximum span, 6 feet; minimum rod size, 1/4 inch.
  - 3. 2-1/2 inch: Maximum span, 9 feet; minimum rod size, 3/8 inch.
  - 4. 3 inch: Maximum span, 10 feet; minimum rod size, 3/8 inch.
  - 5. 4 inch: Maximum span, 12 feet; minimum rod size, 1/2 inch.
  - 6. 6 inch: Maximum span, 14 feet; minimum rod size, 1/2 inch.
  - 7. 8 inch: Maximum span, 16 feet; minimum rod size, 5/8 inch.
  - 8. 10 inch: Maximum span, 18 feet; minimum rod size, 3/4 inch.
  - 9. 12 inch: Maximum span, 19 feet; minimum rod size, 7/8 inch.
- B. Hanger Spacing for Steel Steam Piping.
  - 1. 1/2 inch: Maximum span, 8 feet; minimum rod size, 1/4 inch.
  - 2. 3/4 inch and 1 inch: Maximum span, 9 feet; minimum rod size, 1/4 inch.
  - 3. 1-1/4 inches: Maximum span, 11 feet; minimum rod size, 3/8 inch.
  - 4. 1-1/2 inches: Maximum span, 12 feet; minimum rod size, 3/8 inch.
  - 5. 2 inches: Maximum span, 13 feet; minimum rod size, 3/8 inch.
  - 6. 2-1/2 inches: Maximum span, 14 feet; minimum rod size, 3/8 inch.
  - 7. 3 inches: Maximum span, 15 feet; minimum rod size, 3/8 inch.
  - 8. 4 inches: Maximum span, 17 feet; minimum rod size, 1/2 inch.
  - 9. 6 inches: Maximum span, 21 feet; minimum rod size, 1/2 inch.
  - 10. 8 inches: Maximum span, 24 feet; minimum rod size, 5/8 inch.
  - 11. 10 inches: Maximum span, 26 feet; minimum rod size, 3/4 inch.
- C. Hanger Spacing for Steel Steam Condensate Piping.
  - 1. 1/2 inch, 3/4 inch, and 1 inch: Maximum span, 7 feet; minimum rod size, 1/4 inch.
  - 2. 1-1/4 inches: Maximum span, 8 feet; minimum rod size, 3/8 inch.
  - 3. 1-1/2 inches: Maximum span, 9 feet; minimum rod size, 3/8 inch.
  - 4. 2 inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.
  - 5. 2-1/2 inches: Maximum span, 11 feet; minimum rod size, 3/8 inch.
  - 6. 3 inches: Maximum span, 12 feet; minimum rod size, 3/8 inch.
  - 7. 4 inches: Maximum span, 14 feet; minimum rod size, 1/2 inch.
  - 8. 6 inches: Maximum span, 17 feet; minimum rod size, 1/2 inch.

**END OF SECTION**

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**SECTION 23 2214**  
**STEAM AND CONDENSATE HEATING SPECIALTIES**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Steam traps.
- B. Steam air vents.
- C. Flash tanks.
- D. Deaerators.
- E. Boiler feed units.
- F. Condensate return units.
- G. Receivers.
- H. Condensate pumps.
- I. Vacuum pumping units.
- J. Pressure reducing valves.
- K. Steam safety valves.
- L. Control valves.
- M. Steam condensate meters.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 5223 - Cast-Iron Boilers.

**1.03 REFERENCE STANDARDS**

- A. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard 2020.
- B. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels 2021.
- C. ASME B31.9 - Building Services Piping 2020.
- D. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings 2004 (Reapproved 2019).
- E. ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service 2021.
- F. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- G. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures 1999 (Reapproved 2018).
- H. ASTM A743/A743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application 2021.
- I. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
  - B. Product Data:
    - 1. Provide for manufactured products and assemblies required for this project.
    - 2. Include product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes.
    - 3. Submit schedule indicating manufacturer, model number, size, location, rated capacity, load served, and features for each specialty.
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4. Include electrical characteristics and connection requirements.
  - C. Manufacturer's Installation Instructions: Indicate application, selection, and hookup configuration. Include pipe and accessory elevations.
  - D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional provisions.
    2. Extra Pump Seals: One set for each type and size of pump.
    3. Steam Trap Service Kits: One for each type and size.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum three years of documented experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

### **PART 2 PRODUCTS**

#### **2.01 STEAM TRAPS**

- A. Manufacturers:
    1. Armstrong International, Inc; [\_\_\_\_]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
    2. Marshall Engineered Products Company; [\_\_\_\_]: [www.mepcollc.com/#sle](http://www.mepcollc.com/#sle).
    3. Spirax-Sarco; [\_\_\_\_]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
    4. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Steam Trap Applications:
    1. Use Thermostatic Steam Traps for:
      - a. Steam radiation units.
      - b. Convectors.
      - c. Other similar terminal heating units.
    2. Use Float and Thermostatic Traps for:
      - a. Unit heaters.
      - b. Steam separators.
      - c. Flash tanks.
      - d. Steam jacketed equipment.
      - e. Direct steam injected equipment.
      - f. Deaerators.
      - g. Main headers.
      - h. Branch lines.
  - C. Steam Trap Performance:
    1. Select to handle minimum of two times maximum condensate load of apparatus served.
    2. Pressure Differentials:
      - a. Low Pressure Systems (5 psi and less): 1/2 psi.
  - D. Inverted Bucket Traps: ASTM A126 cast iron or semi-steel body with bolted cover, brass bucket, stainless steel seats and plungers, and stainless steel lever mechanism with knife edge operating surfaces.
    1. Rating: 60 psi WSP.
    2. Features: Access to internal parts without disturbing piping, top test plug, bottom drain plugs.
    3. Accessories:
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- a. Integral inlet strainer of brass.
    - b. Integral inlet check valve.
    - c. Integral bimetal air vent.
  - E. Float and Thermostatic Traps: ASTM A126 cast iron or semi-steel body and bolted cover, stainless steel or bronze bellows type air vent, stainless steel or copper float, stainless steel lever and valve assembly.
    - 1. Rating: 15 psi WSP.
    - 2. Features: Access to internal parts without disturbing piping, bottom drain plug.
    - 3. Accessories: Gauge glass with shut-off cocks.
  - F. Thermodynamic Traps: Stainless steel body, disc, and cap.
    - 1. Rating: 300 psi WSP.
    - 2. Features:
      - a. Stainless steel insulating cap.
      - b. 1/4 inch steel blow down valve.
      - c. Integral strainer.
  - G. Pressure Balanced Thermostatic Traps: ASTM A395/A395M cast iron body and bolted or screwed cover and integral ball joint union for 125 psi WSP; phosphor bronze bellows, stainless steel valve and seat, integral stainless steel strainer.

## 2.02 STEAM AIR VENTS

- A. Manufacturers:
  - 1. Armstrong International, Inc; [ ]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  - 2. Bell and Gossett, a xylem brand; [ ]: [www.bellgossett.com/#sle](http://www.bellgossett.com/#sle).
  - 3. Spirax-Sarco; [ ]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. 125 psi WSP: Balanced pressure type; cast brass body and cover; access to internal parts without disturbing piping; stainless steel bellows, stainless steel valve and seat.
- C. 225 psi WSP: Balanced pressure type; ASTM A126 cast iron body and cover; access to internal parts without disturbing piping; phosphor bronze bellows, stainless steel valve and seat.

## 2.03 FLASH TANKS

- A. Manufacturers:
  - 1. Armstrong International Inc; [ ]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  - 2. Penn Separator Corporation; [ ]: [www.pennseparator.com/#sle](http://www.pennseparator.com/#sle).
  - 3. Wessels Company; [ ]: [www.westank.com/#sle](http://www.westank.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Tank: Closed type, welded steel construction, cleaned, prime coated, and supplied with steel support legs.
  - 1. Tested and stamped in accordance with ASME BPVC-VIII-1.
  - 2. Working Pressure: 100 psi.
  - 3. Construct with nozzles and tapings for installation of accessories and piping connections.

## 2.04 DEAERATORS

- A. Deaerator System: Consists of storage tank, surge tank, boiler feed pumps, transfer pumps, float switches, control panel and accessories.
  - B. Deaerator Storage Tank:
    - 1. Horizontal welded steel, ASME BPVC-VIII-1 stamped construction.
    - 2. Working Pressure: 50 psi.
    - 3. Manhole: 11 by 15 inch.
    - 4. Base: Elevated, fabricated steel.
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- C. Storage Tank Accessories:
    - 1. Steam pressure reducing valve.
    - 2. Water level gauge glass.
    - 3. Manual and automatic vent valves.
    - 4. Pressure relief valve.
    - 5. Thermometer.
    - 6. Pressure gauge.
    - 7. Adjustable inlet spray valve.
    - 8. Overflow drain.
    - 9. Manual drain valve.
    - 10. Pressure gauges on pump discharge.
    - 11. Bronze isolation valves and strainers between boiler feed pumps and tanks.
    - 12. Double pole high and low level alarm float switches.
  - D. Surge Tank: Horizontal welded steel.
    - 1. ASME BPVC-VIII-1 stamped construction.
    - 2. Working Pressure: 50 psi.
    - 3. Manhole: 11 by 15 inch.
    - 4. Base: Elevated, fabricated steel.
  - E. Surge Tank Accessories:
    - 1. Water level gauge glass.
    - 2. Pressure relief valve.
    - 3. Thermometer.
    - 4. Pressure gauge.
    - 5. Inlet diffuser.
    - 6. Overflow drain.
    - 7. Manual drain valve.
    - 8. Pressure gauges on pump discharge.
    - 9. Bronze isolation valves and strainers between transfer pumps and tank.
    - 10. Double pole low level alarm float switch.
  - F. Boiler Feed Pumps: One stage, vertical design, bronze fitted with stainless steel shaft, bronze impeller, renewable bronze case ring, mechanical shaft seal, close coupled to 3500 rpm motor.
  - G. Transfer Pumps: Vertical design, bronze fitted with stainless steel shaft, enclosed bronze impeller, renewable bronze case ring, mechanical shaft seal, close coupled to motor.
  - H. Control Cabinet:
    - 1. NEMA 250 enclosure, UL listed, with piano hinged door, grounding lug terminal strip and fusible control circuit transformer.
    - 2. Combination magnetic starters with overload relays, circuit breakers and cover interlock.
    - 3. Electric alternator, 'Auto-Off' switch.
    - 4. Selector 'lead-off-lag' switches.
    - 5. Alarm lights, acknowledge button, test buttons, alarm horn.
  - I. Control Sequence:
    - 1. Operate boiler feed pumps from boiler controls; see Section 23 5223.

## **2.05 LOW PRESSURE BOILER FEED UNITS**

- A. Boiler Feed Units: Consist of receiver, inlet strainer, pumps, water make-up assembly, electric control components and accessories.
  - B. Condensate Receiver: Cast iron, equipped with water level gauge, dial thermometer, pressure gauges on pump discharge, bronze isolation valves and strainer between pumps and receiver, and lifter eye bolts.
-



- C. Inlet Strainer: Cast iron, with vertical self-cleaning easily removable bronze screen and large dirt pocket, mounted on receiver.
- D. Water Make-Up Assembly: Level control switch and solenoid valve mounted on receiver.
  - 1. Valve: Packless, piston pilot operated type with cushioned closing and epoxy resin molded waterproof coil.
  - 2. Capacity: Equal to one boiler feed pump.
  - 3. With strainer, and manual bypass.
- E. Pumps: Vertical design, bronze fitted with stainless steel shaft, enclosed bronze impeller, renewable bronze case ring, mechanical shaft seal, close coupled to motor.

## 2.06 LOW PRESSURE CONDENSATE RETURN UNITS

- A. Manufacturers:
  - 1. Bryan Steam Corporation; [ ]: [www.bryanboilers.com/#sle](http://www.bryanboilers.com/#sle).
  - 2. Marshall Engineered Products Company; [ ]: [www.mepcollc.com/#sle](http://www.mepcollc.com/#sle).
  - 3. Spirax-Sarco; [ ]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
- B. Condensate Return Units: Consist of receiver, inlet strainer, pumps, float switches, control panel and accessories.
- C. Condensate Receiver: Cast iron, equipped with externally adjustable float switches, water level gauge, dial thermometer, pressure gauges on pump discharge, bronze isolation valves between pumps and receiver, and lifting eye bolts.
- D. Inlet Strainer: Cast iron with vertical self-cleaning bronze screen and large dirt pocket, mounted on receiver. Screen shall be easily removable for cleaning.
- E. Pumps: One stage, vertical design, bronze fitted with stainless steel shaft, bronze impeller, renewable bronze case ring, mechanical shaft seal, close coupled to 1750 rpm motor.
- F. Control Cabinet:
  - 1. NEMA 250 enclosure, UL listed, with piano hinged door, grounding lug, terminal strip, and fusible control circuit transformer.
  - 2. Combination magnetic starters with overload relays, circuit breakers and cover interlock.
  - 3. Electric alternator.
    - a. Operate pumps on high level, alternating after each cycle.
    - b. Operate second pump upon failure of first pump and alarm.
  - 4. 'Auto-Off' switch.
  - 5. Test button, high level alarm light, acknowledge button, alarm horn.

## 2.07 RECEIVERS

- A. Manufacturers:
  - 1. Bryan Steam Corporation; [ ]: [www.bryanboilers.com/#sle](http://www.bryanboilers.com/#sle).
  - 2. Marshall Engineered Products Company; [ ]: [www.mepcollc.com/#sle](http://www.mepcollc.com/#sle).
  - 3. Spirax-Sarco; [ ]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Condensate Receiver: Cast iron, equipped with tappings for mounting float switches, water level gauge, thermometers, pump suction fittings, condensate inlet, and lifting eye bolts.

## 2.08 CONDENSATE PUMPS

- A. Manufacturers:
  - 1. Bryan Steam Corporation; [ ]: [www.bryanboilers.com/#sle](http://www.bryanboilers.com/#sle).
  - 2. Marshall Engineered Products Company; [ ]: [www.mepcollc.com/#sle](http://www.mepcollc.com/#sle).
  - 3. Spirax-Sarco; [ ]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
- B. Pumps: Vertical design, bronze fitted with stainless steel shaft, enclosed bronze impeller, renewable bronze case ring, mechanical shaft seal, close coupled to motor.



**2.09 VACUUM PUMPING UNITS**

- A. Vacuum Pumping Units: Consist of receiver on which are mounted inlet strainer, pumps, discharge valve assemblies, vacuum and float controls, electric controls and accessories.
- B. Receiver: Two compartment cast iron with multi-jet vacuum producers, centerline of inlet no higher than 8 inches from floor.
- C. Accessories: Vacuum gauge, thermometer, water level gauge, lifting eye bolts, and vacuum breaker.
- D. Inlet Strainer: Cast iron with vertical self-cleaning bronze screen and large dirt pocket, mounted on receiver. Screen shall be vertically removable for cleaning.
- E. Condensate Discharge: Control with hydraulically operated positive acting discharge valves with bronze bellows and float operated pilot valves.
- F. Pumps: Vertical design, flange mounted, bronze fitted with stainless steel shaft, enclosed bronze impeller, renewable bronze case ring, mechanical shaft seal, close coupled to motor.
- G. Control Cabinet:
  - 1. NEMA 250 enclosure with piano hinged door, grounding lug, terminal strip, and fusible control circuit transformer.
  - 2. Combination magnetic starters with overload relays, circuit breakers and cover interlock.
  - 3. Selector switches "off", "float only", "float & vacuum", "continuous".
  - 4. Electric alternator, test buttons.

**2.10 PRESSURE REDUCING VALVES**

- A. Manufacturers:
  - 1. Armstrong International, Inc; GP 2000 PRV: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  - 2. Cash Acme, a brand of Reliance Worldwide Corporation; [\_\_\_\_]: [www.cashacme.com/#sle](http://www.cashacme.com/#sle).
  - 3. McDonnell & Miller, a xylem brand; [\_\_\_\_]: [www.mcdonnellmiller.com/#sle](http://www.mcdonnellmiller.com/#sle).
  - 4. Spirax-Sarco; [\_\_\_\_]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Bronze or cast iron body, stainless or chrome steel valve spring, stem, and trim, phosphor bronze diaphragm, direct acting, threaded up to 2 inches, flanged over 2 inches.

**2.11 SAFETY RELIEF VALVES**

- A. Manufacturers:
  - 1. Armstrong International, Inc; [\_\_\_\_]: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
  - 2. Cash Acme, a brand of Reliance Worldwide Corporation; [\_\_\_\_]: [www.cashacme.com/#sle](http://www.cashacme.com/#sle).
  - 3. ITT McDonnell & Miller, a xylem brand; [\_\_\_\_]: [www.mcdonnellmiller.com/#sle](http://www.mcdonnellmiller.com/#sle).
  - 4. Spirax-Sarco; [\_\_\_\_]: [www.spiraxsarco.com/us/#sle](http://www.spiraxsarco.com/us/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Valve: Bronze body, stainless steel valve spring, stem, and trim, direct pressure actuated, capacities ASME certified and labelled.
- C. Accessories: Drip pan elbow.

**2.12 CONTROL VALVES**

- A. Manufacturers:
    - 1. Armstrong International Inc; Python Control Valve: [www.armstronginternational.com/#sle](http://www.armstronginternational.com/#sle).
    - 2. Substitutions: See Section 01 6000 - Product Requirements.
  - B. Materials:
    - 1. Valve Body: Carbon steel A216 Grade WCB.
    - 2. Bonnet: Carbon steel A216 Grade WCB.
-



3. Valve/Valve Seat: 17-4 PH h900.
4. Valve Spindle: Stainless steel, comply with ASTM A276/A276M, Type 431.
5. Gland Packing:
  - a. Carbon filled V-Teflon, 450 degrees F.
6. Yoke: Ductile iron.
7. Actuator Spring: Silicon chromium spring steel.
8. Actuator Diaphragm: Nitrite reinforced with nylon fiber.
9. Cage Material: Stainless steel CB30, comply with ASTM A743/A743M.
10. Sealing Ring Material: Carbon filled V-Teflon.

## 2.13 RADIATOR VALVES

- A. Manufacturers:
  1. Oventrop Corporation; Series S: [www.ventrop.com/#sle](http://www.ventrop.com/#sle).
  2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Angle, straight, or reversed angle pattern, rising stem, inside screw globe valve for 145 psi working pressure, with bronze body and integral union for screwed connections, renewable composition disc, plastic wheel handle for shut-off service, and lockshield key cap and set screw memory bonnet for balancing service.

## 2.14 STEAM CONDENSATE METERS

- A. Cast iron body, stainless steel rotor and gears, tungsten carbide bearings, bronze trim, vortex type meter with vaned rotor.
- B. Standard meter registers in gallons, calibrated for water at 200 degrees F, with temperature correction chart, maximum totalization 1,000,000 gallons.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install steam and steam condensate piping and specialties in accordance with ASME B31.9.
- B. Install specialties in accordance with manufacturer's instructions.
- C. Steam Traps:
  1. Provide minimum 3/4 inch size on steam mains and branches.
  2. Install with union or flanged connections at both ends.
  3. Provide gate valve and strainer at inlet, and gate valve and check valve at discharge.
  4. Provide minimum 10 inch long, line size dirt pocket between apparatus and trap.
- D. Remove thermostatic elements from steam traps during temporary and trial usage, and until system has been operated and dirt pockets cleaned of sediment and scale.
- E. In high pressure and medium pressure mains, provide 3/4 inch nipple in bottom of main, extending 3/4 inch into and above bottom of pipe. Provide dirt pocket with 1/2 inch high pressure thermostatic trap.
- F. Provide pressure reducing stations with pressure reducing valve, valved bypass, strainer and pressure gauge on upstream side, relief valve and pressure gauge on downstream side of pressure reducing valve.
  1. Pressure reducing station shall be one or two stages as required, to produce flat reduced pressure curve over range of capacity.
  2. Locate pilot operator control minimum 6 feet downstream of valve.
- G. Rate relief valves for pressure upstream of pressure reducing station, for full operating capacity. Set relief at maximum 20 percent above reduced pressure.
- H. When several relief valve vents are connected to a common header, header cross section area shall equal sum of individual vent outlet areas.

**END OF SECTION**



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**SECTION 23 2500  
HVAC WATER TREATMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Materials.
  - 1. Steam system treatment.
- B. By-pass (pot) feeder.
- C. Drip feeder.
- D. Solution metering pump.
- E. Solution tanks.
- F. Agitator.
- G. Conductivity controller.
- H. Water meter.
- I. Solenoid valves.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 6000 - Product Requirements: Owner furnished treatment equipment.
- B. Section 23 0913 - Instrumentation and Control Devices for HVAC.

**1.03 REFERENCE STANDARDS**

- A. FM (AG) - FM Approval Guide current edition.
- B. ITS (DIR) - Directory of Listed Products current edition.
- C. UL (DIR) - Online Certifications Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide chemical treatment materials, chemicals, and equipment including electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate system schematic, equipment locations, and controls schematics, electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Indicate placement of equipment in systems, piping configuration, and connection requirements.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Sufficient chemicals for treatment and testing during required maintenance period.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience. Company shall have local representatives with water analysis laboratories and full time service personnel.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. AmSolv-Amrep, Inc; [\_\_\_\_]: [www.amsolv.com/#sle](http://www.amsolv.com/#sle).
  - B. GE Water & Process Technologies; [\_\_\_\_]: [www.gewater.com/#sle](http://www.gewater.com/#sle).
  - C. Nalco, an Ecolab Company; [\_\_\_\_]: [www.nalco.com/#sle](http://www.nalco.com/#sle).
  - D. Substitutions: See Section 01 6000 - Product Requirements.
-



## **2.02 REGULATORY REQUIREMENTS**

- A. Comply with applicable codes for addition of non-potable chemicals to building mechanical systems and to public sewage systems.
- B. Comply with UL (DIR) requirements.
- C. Perform work in accordance with local health department regulations.
- D. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation.

## **2.03 MATERIALS**

- A. Steam System Treatment:
  - 1. Manufacturers:
    - a. AmSolv-Amrep, Inc; [\_\_\_\_]: [www.amsolv.com/#sle](http://www.amsolv.com/#sle).
    - b. GE Water & Process Technologies; [\_\_\_\_]: [www.gewater.com/#sle](http://www.gewater.com/#sle).
    - c. Nalco, an Ecolab Company; [\_\_\_\_]: [www.nalco.com/#sle](http://www.nalco.com/#sle).
  - 2. Sequestering agent to reduce hardness and prevent feedline congestion; phosphate.
  - 3. Base to provide alkalinity; hydroxide.
  - 4. Carbon dioxide neutralizer; volatile amines such as morpholine or cyclohexylamine.
  - 5. Filming amines; octadecylamine.

## **2.04 BY-PASS (POT) FEEDER**

## **2.05 SOLUTION METERING PUMP**

- A. Manufacturers:
  - 1. J. L. Wingert Company; [\_\_\_\_]: [www.jlwingert.com/#sle](http://www.jlwingert.com/#sle).
  - 2. Dover Corporation; [\_\_\_\_]: [www.neptune1.com/#sle](http://www.neptune1.com/#sle).
- B. Electrical Characteristics:
  - 1. Cord and Plug: Provide unit with 6 foot cord and plug for connection to electric wiring system including grounding connector.

## **2.06 SOLUTION TANKS**

- A. Manufacturers:
- B. 30 gallon capacity, polyethylene, self-supporting, 1 gallon graduated markings; molded fiberglass cover with recess for mounting pump, agitator, and liquid level switch.

## **2.07 AGITATOR**

- A. Manufacturers:
- B. Totally enclosed electric motor, cast iron clamp and motor mount, 1/2 inch diameter coated Type 316 stainless steel propeller.

## **2.08 CONDUCTIVITY CONTROLLER**

- A. Manufacturers:
  - 1. Envirocare International; [\_\_\_\_]: [www.envirocare.com/#sle](http://www.envirocare.com/#sle).
  - 2. JENCO Instruments Incorporated; [\_\_\_\_]: [www.jencoi.com/#sle](http://www.jencoi.com/#sle).
  - 3. Omega Engineering, Inc; [\_\_\_\_]: [www.omega.com/#sle](http://www.omega.com/#sle).
- B. Packaged monitor controller with solid state circuiting, five percent accuracy, linear dial adjustment, built-in calibration switch, on-off switch and light, control function light, output to control circuit and recorder.

## **2.09 WATER METER**

- A. Displacement type cold water meter with sealed, tamper-proof magnetic drive, impulse contact register, single pole, double throw dry contact switch.
-



## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Systems shall be operational, filled, started, and vented prior to cleaning. Use water meter to record capacity in each system.
- B. Place terminal control valves in open position during cleaning.
- C. Verify that electric power is available and of the correct characteristics.

### **3.02 CLEANING SEQUENCE**

- A. Steam Systems:
  - 1. Apply heat, slowly raising boiler temperature to 160 degrees F and maintain for 12 hours minimum.
  - 2. Cool, then drain as quickly as possible.
  - 3. Refill with clean water, drain, refill and check for sludge.
  - 4. Repeat until system is free of sludge.
  - 5. Apply heat to produce steam for piping system and maintain for 8 hours minimum. Bypass traps and waste condensate.
- B. Use neutralizer agents on recommendation of system cleaner supplier and approval of Architect/Engineer.
- C. Flush open systems and glycol filled closed systems with clean water for one hour minimum. Drain completely and refill.
- D. Remove, clean, and replace strainer screens.
- E. Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.

### **3.04 STEAM SYSTEM TREATMENT**

- A. Provide bypass feeder on feed water line to each boiler.
- B. Activate solution pumps when feed water pumps are running.
- C. Provide conductivity controller to sample boiler water and operate solenoid blowdown valve. Provide timer activated sampling with solenoid valve, balancing valve, and conductivity probe. Pipe to blowdown tank.
- D. Provide 3/4 inch water coupon rack on each feed water pump with space for 4 test specimens.
- E. Provide liquid level switch in each solution tank to deactivate solution pump and agitator and sound local alarm bell.

### **3.05 CLOSEOUT ACTIVITIES**

- A. Training: Train Owner's personnel on operation and maintenance of chemical treatment system.
  - 1. Provide minimum of two hours of instruction for two people.
  - 2. Have operation and maintenance data prepared and available for review during training.
  - 3. Conduct training using actual equipment after treated system has been put into full operation.

### **3.06 MAINTENANCE**

- A. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the equipment manufacturer or original installer.
  - B. Provide service and maintenance of treatment systems for one year from Date of Substantial Completion.
-



- C. Provide monthly technical service visits to perform field inspections and make water analysis on-site. Detail findings in writing on proper practices, chemical treating requirements, and corrective actions needed. Submit two copies of field service report after each visit.
- D. Provide laboratory and technical assistance services during this maintenance period.
- E. Provide on-site inspections of equipment during scheduled or emergency shutdown to properly evaluate success of water treatment program, and make recommendations in writing based upon these inspections.

**END OF SECTION**



**SECTION 23 3100  
HVAC DUCTS AND CASINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal ductwork.
- B. Nonmetal ductwork.
- C. Casings and plenums.
- D. Duct cleaning.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC-CPL.
- B. Section 23 0713 - Duct Insulation-CPL: External insulation and duct liner.
- C. Section 23 3300 - Air Duct Accessories.
- D. Section 23 3600 - Air Terminal Units.
- E. Section 23 3700 - Air Outlets and Inlets.

**1.03 REFERENCE STANDARDS**

- A. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- E. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements 2015.
- F. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements 2015.
- G. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements 2015.
- H. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements 2016.
- I. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.
- J. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual 2012.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for duct materials.
- C. Shop Drawings: Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration prior to start of work for [ ] pressure class and higher systems.
- D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA (LEAK).

**1.05 QUALITY ASSURANCE**

**PART 2 PRODUCTS**

**2.01 DUCT ASSEMBLIES**

- A. Regulatory Requirements: Construct ductwork to comply with NFPA 90A standards.
  - B. Ducts: Galvanized steel, unless otherwise indicated.
-



- C. Low Pressure Supply (Heating Systems): 2 inch wg pressure class, galvanized steel.
- D. Low Pressure Supply (System with Cooling Coils): 2 inch wg pressure class, galvanized steel.
- E. Return and Relief: 2 inch wg pressure class, galvanized steel.
- F. General Exhaust: 1 inch wg pressure class, galvanized steel.
- G. Transfer Air and Sound Boots: 1/2 inch wg pressure class, galvanized steel.

## 2.02 MATERIALS

- A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
  - 1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
  - 2. VOC Content: Not more than 250 g/L, excluding water.
  - 3. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
  - 4. Manufacturers:
    - a. Carlisle HVAC Products; Hardcast Versa-Grip 181 Water Based Fiber Reinforced Duct Sealant: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
    - b. Design Polymeric; DP 1010 Water Based Smooth Duct Sealant, Zero VOC, Premium Quality: [www.designpoly.com/#sle](http://www.designpoly.com/#sle).
    - c. Ductmate Industries, Inc, a DMI Company; [\_\_\_\_]: [www.ductmate.com/#sle](http://www.ductmate.com/#sle).
- C. Gasket Tape: Provide butyl rubber gasket tape for a flexible seal between transfer duct connector (TDC), transverse duct flange (TDF), applied flange connections, and angle rings connections.
- D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
- E. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
  - 1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
  - 2. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
  - 3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
  - 4. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
  - 5. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
  - 6. Other Types: As required.

## 2.03 DUCTWORK FABRICATION

- A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.
- B. No variation of duct configuration or size permitted except by written permission. Size round duct installed in place of rectangular ducts in accordance with ASHRAE (FUND) Handbook - Fundamentals.
- C. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.
- D. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
- E. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
- F. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- G. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).



## **2.04 MANUFACTURED DUCTWORK AND FITTINGS**

- A. Flat Oval Ducts: Machine made from round spiral lockseam duct.
  - 1. Manufacture in accordance with SMACNA (DCS).
  - 2. Fittings: Manufacture at least two gauges heavier metal than duct.
  - 3. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.
- B. Spiral Ducts: Round spiral lockseam duct with galvanized steel outer wall.
  - 1. Manufacture in accordance with SMACNA (DCS).
- C. Round Ducts: Round lockseam duct with galvanized steel outer wall.
  - 1. Manufacture in accordance with SMACNA (DCS).
- D. Flexible Ducts: Two ply vinyl film supported by helically wound spring steel wire.
  - 1. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
  - 2. Pressure Rating: 10 inches wg positive and 1.0 inches wg negative.
  - 3. Maximum Velocity: 4000 fpm.
  - 4. Temperature Range: Minus 10 degrees F to 160 degrees F.
- E. Transverse Duct Connection System: SMACNA "E" rated rigidly class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).
- F. Round Duct Connection System: Interlocking duct connection system in accordance with SMACNA (DCS).

## **2.05 CASINGS AND PLENUMS**

- A. Fabricate casings in accordance with SMACNA (DCS) and construct for operating pressures indicated.
- B. Mount floor mounted casings on 4 inch high concrete curbs. At floor, rivet panels on 8 inch centers to angles. Where floors are acoustically insulated, provide liner of galvanized 18 gauge, 0.0478 inch expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields.
- C. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
  - B. Install in accordance with manufacturer's instructions.
  - C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
  - D. Flexible Ducts: Connect to metal ducts with adhesive.
  - E. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
  - F. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
  - G. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
  - H. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
  - I. Use double nuts and lock washers on threaded rod supports.
-



- J. Connect terminal units to supply ducts directly or with one foot maximum length of flexible duct. Do not use flexible duct to change direction.
- K. Connect diffusers or light troffer boots to low pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.

### **3.02 CLEANING**

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.

**END OF SECTION**



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**SECTION 23 3113  
METAL DUCTS  
PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Single-wall rectangular ducts and fittings.
  - 2. Single-wall round ducts and fittings.
  - 3. Sheet metal materials.
  - 4. Sealants and gaskets.
  - 5. Hangers and supports.
- B. Related Sections:
  - 1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of the following products:
  - 1. Sealants and gaskets.
- B. Shop Drawings:
  - 1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
  - 2. Factory- and shop-fabricated ducts and fittings.
  - 3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
  - 4. Elevation of top of ducts.
  - 5. Fittings.
  - 6. Reinforcement and spacing.
  - 7. Seam and joint construction.
  - 8. Equipment installation based on equipment being used on Project.
  - 9. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
  - 10. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
  - 2. Suspended ceiling components.
  - 3. Structural members to which duct will be attached.
  - 4. Size and location of initial access modules for acoustical tile.
  - 5. Penetrations of smoke barriers and fire-rated construction.
  - 6. Items penetrating finished ceiling including the following:
    - a. Lighting fixtures.
    - b. Air outlets and inlets.



- c. Speakers.
  - d. Sprinklers.
  - e. Access panels.
  - f. Perimeter moldings.
- B. Welding certificates.
- C. Field quality-control reports.

## **1.06 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
- 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
  - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
  - 3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

## **PART 2 PRODUCTS**

### **2.01 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS**

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### **2.02 SINGLE-WALL ROUND DUCTS AND FITTINGS**

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Lindab Inc.
  - b. McGill AirFlow LLC.
  - c. SEMCO Incorporated.
  - d. Sheet Metal Connectors, Inc.
  - e. Spiral Manufacturing Co., Inc.



- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

## 2.03 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G90.
  - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
  - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

## 2.04 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
  - 1. Water-Based Joint and Seam Sealant:
  - 2. Application Method: Brush on.
  - 3. Solids Content: Minimum 65 percent.
  - 4. Shore A Hardness: Minimum 20.
  - 5. Water resistant.
  - 6. Mold and mildew resistant.
  - 7. VOC: Maximum 75 g/L (less water).
  - 8. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
  - 9. Service: Indoor or outdoor.
  - 10. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.
- B. Flanged Joint Sealant: Comply with ASTM C 920.
  - 1. General: Single-component, acid-curing, silicone, elastomeric.
  - 2. Type: S.
  - 3. Grade: NS.



4. Class: 25.
  5. Use: O.
  6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
- D. Round Duct Joint O-Ring Seals:
1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
  2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
  3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

## **2.05 HANGERS AND SUPPORTS**

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.
- E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.
- F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- H. Trapeze and Riser Supports:
1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
  2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
  3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

## **PART 3 EXECUTION**

### **3.01 DUCT INSTALLATION**

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.



- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- K. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

### **3.02 INSTALLATION OF EXPOSED DUCTWORK**

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

### **3.03 DUCT SEALING**

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### **3.04 HANGER AND SUPPORT INSTALLATION**

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  - 1. Where practical, install concrete inserts before placing concrete.
  - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
  - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
  - 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.



### **3.05 CONNECTIONS**

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

### **3.06 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Leakage Tests:
  - 1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
  - 2. Test the following systems:
    - a. Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Engineer from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
  - 3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
  - 4. Test for leaks before applying external insulation.
  - 5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
  - 6. Give seven days' advance notice for testing.
- C. Duct system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

### **3.07 START UP**

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

### **3.08 DUCT SCHEDULE**

- A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:
- B. Exhaust Ducts:
  - 1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:
    - a. Pressure Class: Negative 2-inch wg.
    - b. Minimum SMACNA Seal Class: C if negative pressure, and A if positive pressure.
    - c. SMACNA Leakage Class for Rectangular: 12.
    - d. SMACNA Leakage Class for Round : 12.
- C. Intermediate Reinforcement:
  - 1. Galvanized-Steel Ducts: Galvanized steel or carbon steel coated with zinc-chromate primer.

**END OF SECTION**



**SECTION 23 3300  
AIR DUCT ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Air turning devices/extractors.
- B. Backdraft dampers - metal.
- C. Backdraft dampers - fabric.
- D. Combination fire and smoke dampers.
- E. Duct access doors.
- F. Duct test holes.
- G. Fire dampers.
- H. Flexible duct connectors.
- I. Smoke dampers.
- J. Volume control dampers.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 23 3100 - HVAC Ducts and Casings.
- C. Section 25 3523 - Integrated Automation Control Dampers: Product furnishing.

**1.03 REFERENCE STANDARDS**

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- B. NFPA 92 - Standard for Smoke Control Systems 2021.
- C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.
- D. UL 33 - Safety Heat Responsive Links for Fire-Protection Service Current Edition, Including All Revisions.
- E. UL 555 - Standard for Fire Dampers Current Edition, Including All Revisions.
- F. UL 555S - Standard for Smoke Dampers Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide for shop fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Fusible Links: One of each type and size.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect dampers from damage to operating linkages and blades.
-



## **PART 2 PRODUCTS**

### **2.01 AIR TURNING DEVICES/EXTRACTORS**

- A. Manufacturers:
  - 1. Carlisle HVAC Products; Dynair Hollow Vane and Rail (Double Wall Vane): [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
  - 2. Elgen Manufacturing Company, Inc: [www.elgenmfg.com/#sle](http://www.elgenmfg.com/#sle).
  - 3. Krueger-HVAC, Division of Air System Components: [www.krueger-hvac.com/#sle](http://www.krueger-hvac.com/#sle).
  - 4. Ruskin Company: [www.ruskin.com/#sle](http://www.ruskin.com/#sle).
  - 5. Titus HVAC, a brand of Johnson Controls: [www.titus-hvac.com/#sle](http://www.titus-hvac.com/#sle).
  - 6. Ward Industries, a brand of Hart and Cooley, Inc: [www.wardind.com/#sle](http://www.wardind.com/#sle).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.

### **2.02 BACKDRAFT DAMPERS - METAL**

- A. Gravity Backdraft Dampers, Size 18 by 18 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.

### **2.03 BACKDRAFT DAMPERS - FABRIC**

- A. Fabric Backdraft Dampers: Factory-fabricated.
  - 1. Blades: Neoprene coated fabric material.
  - 2. Birdscreen: 1/2 inch nominal mesh of galvanized steel or aluminum.
  - 3. Maximum Velocity: 1000 fpm (5 mps) face velocity.

### **2.04 COMBINATION FIRE AND SMOKE DAMPERS**

- A. Products furnished per Section 25 3523.
- B. Manufacturers:
  - 1. AireTechnologies, Inc, a DMI Company: [www.airetechnologies.com/#sle](http://www.airetechnologies.com/#sle).
  - 2. Lloyd Industries, Inc: [www.firedamper.com/#sle](http://www.firedamper.com/#sle).
  - 3. Louvers & Dampers, Inc, a brand of Mestek, Inc: [www.louvers-dampers.com/#sle](http://www.louvers-dampers.com/#sle).
  - 4. Nailor Industries, Inc: [www.nailor.com/#sle](http://www.nailor.com/#sle).
  - 5. NCA, a brand of Metal Industries Inc: [www.ncamfg.com/#sle](http://www.ncamfg.com/#sle).
  - 6. Pottorff: [www.pottorff.com/#sle](http://www.pottorff.com/#sle).
  - 7. Ruskin Company: [www.ruskin.com/#sle](http://www.ruskin.com/#sle).
- C. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.
- D. Provide factory sleeve and collar for each damper.
- E. Multiple Blade Dampers: Fabricate with 16 gauge, 0.0598 inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 by 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.
- F. Operators: UL listed and labelled spring return electric type suitable for 120 volts, single phase, 60 Hz. Provide end switches to indicate damper position. Locate damper operator on interior of duct and link to damper operating shaft.
- G. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.
- H. Security Bars: Comply with NFPA 90A, UL 555, and UL 555S. Install per manufacturer's instructions.

### **2.05 DUCT ACCESS DOORS**

- A. Manufacturers:
    - 1. Ductmate Industries, Inc, a DMI Company; [\_\_\_\_]: [www.ductmate.com/#sle](http://www.ductmate.com/#sle).
-



2. Elgen Manufacturing Company, Inc; [\_\_\_\_]: [www.elgenmfg.com/#sle](http://www.elgenmfg.com/#sle).
  3. Nailor Industries, Inc; [\_\_\_\_]: [www.nailor.com/#sle](http://www.nailor.com/#sle).
  4. Ruskin Company; [\_\_\_\_]: [www.ruskin.com/#sle](http://www.ruskin.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Access doors with sheet metal screw fasteners are not acceptable.

## **2.06 DUCT TEST HOLES**

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

## **2.07 FIRE DAMPERS**

- A. Manufacturers:
1. Lloyd Industries, Inc: [www.firedamper.com/#sle](http://www.firedamper.com/#sle).
  2. Nailor Industries, Inc: [www.nailor.com/#sle](http://www.nailor.com/#sle).
  3. Ruskin Company: [www.ruskin.com/#sle](http://www.ruskin.com/#sle).
  4. United Enertech: [www.unitedenertech.com/#sle](http://www.unitedenertech.com/#sle).
  5. Ward Industries, a brand of Hart and Cooley, Inc; [\_\_\_\_]: [www.wardind.com/#sle](http://www.wardind.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
- C. Horizontal Dampers: Galvanized steel, 22 gauge, 0.0299 inch frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.
- D. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

## **2.08 FLEXIBLE DUCT CONNECTORS**

- A. Manufacturers:
1. Carlisle HVAC Products; Dynair Connector Plus G90 Steel Offset Seam Neoprene Fabric: [www.carlislehvac.com/#sle](http://www.carlislehvac.com/#sle).
  2. Ductmate Industries, Inc, a DMI Company: [www.ductmate.com/#sle](http://www.ductmate.com/#sle).
  3. Elgen Manufacturing Company, Inc: [www.elgenmfg.com/#sle](http://www.elgenmfg.com/#sle).
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Flexible Duct Connections: Fabric crimped into metal edging strip.
- D. Maximum Installed Length: 14 inch.

## **2.09 SMOKE DAMPERS**

- A. Manufacturers:
1. AireTechnologies, Inc, a DMI Company: [www.airetechnologies.com/#sle](http://www.airetechnologies.com/#sle).
  2. Louvers & Dampers, Inc, a brand of Mestek, Inc: [www.louvers-dampers.com/#sle](http://www.louvers-dampers.com/#sle).
  3. Nailor Industries, Inc: [www.nailor.com/#sle](http://www.nailor.com/#sle).
  4. Ruskin Company: [www.ruskin.com/#sle](http://www.ruskin.com/#sle).
  5. United Enertech: [www.unitedenertech.com/#sle](http://www.unitedenertech.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with NFPA 90A and UL 555S, and as indicated.
- C. Dampers: UL Class 1 airfoil blade type smoke damper, normally closed automatically operated by electric actuator.

## **2.10 VOLUME CONTROL DAMPERS**

- A. Manufacturers:
1. Louvers & Dampers, Inc, a brand of Mestek, Inc: [www.louvers-dampers.com/#sle](http://www.louvers-dampers.com/#sle).
  2. Nailor Industries, Inc: [www.nailor.com/#sle](http://www.nailor.com/#sle).
  3. Ruskin Company: [www.ruskin.com/#sle](http://www.ruskin.com/#sle).



4. United Enertech: [www.unitedenertech.com/#sle](http://www.unitedenertech.com/#sle).
5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Single Blade Dampers:
  1. Fabricate for duct sizes up to 6 by 30 inch.
  2. Blade: 24 gauge, 0.0239 inch, minimum.
- D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
  1. Blade: 18 gauge, 0.0478 inch, minimum.
- E. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Verify that electric power is available and of the correct characteristics.

#### **3.02 INSTALLATION**

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.
- B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide minimum 8 by 8 inch size for hand access, size for shoulder access, and as indicated. Provide 4 by 4 inch for balancing dampers only. Review locations prior to fabrication.
- D. Provide duct test holes where indicated and required for testing and balancing purposes.
- E. Provide fire dampers, combination fire and smoke dampers, and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by Authorities Having Jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- F. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92.
- G. Demonstrate re-setting of fire dampers to Owner's representative.
- H. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.
- I. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.
- J. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- K. Use splitter dampers only where indicated.
- L. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

#### **END OF SECTION**



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**SECTION 23 3423  
HVAC POWER VENTILATORS  
PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Centrifugal roof ventilators.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Project Altitude: Base fan-performance ratings on actual Project site elevations.
- B. Operating Limits: Classify according to AMCA 99.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Also include the following:
  - 1. Certified fan performance curves with system operating conditions indicated.
  - 2. Certified fan sound-power ratings.
  - 3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
  - 4. Material thickness and finishes, including color charts.
  - 5. Dampers, including housings, linkages, and operators.
  - 6. Roof curbs.
  - 7. Fan speed controllers.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 2. Wiring Diagrams: For power, signal, and control wiring.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
  - 1. Roof framing and support members relative to duct penetrations.
  - 2. Ceiling suspension assembly members.
  - 3. Size and location of initial access modules for acoustical tile.
  - 4. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- B. Field quality-control reports.

**1.06 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

**1.07 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Belts: One set for each belt-driven unit.

**1.08 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
-



- B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.
- C. UL Standards: Power ventilators shall comply with UL 705.

## **1.09 COORDINATION**

- A. Coordinate size and location of structural-steel support members.
- B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

## **PART 2 PRODUCTS**

### **2.01 CENTRIFUGAL ROOF VENTILATORS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Breidert Air Products.
  - 2. Carnes Company.
  - 3. Greenheck Fan Corporation.
  - 4. Hartzell Fan Incorporated.
  - 5. Loren Cook Company.
- B. Housing: Removable, Louvered; square, aluminum base.
  - 1. Downblast Units: Provide Louvered-aluminum discharge baffle to direct discharge air downward, with rain and snow drains .
  - 2. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.
- C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.
- D. Belt Drives:
  - 1. Resiliently mounted to housing.
  - 2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
  - 3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
  - 4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
  - 5. Fan and motor isolated from exhaust airstream.
- E. Accessories:
  - 1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.
  - 2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
  - 3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
- F. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.
  - 1. Configuration: Built-in cant and mounting flange.
  - 2. Overall Height: 18 inches
  - 3. Sound Curb: Curb with sound-absorbing insulation.
  - 4. Pitch Mounting: Manufacture curb for connection to plenum box.
  - 5. Metal Liner: Galvanized steel.
  - 6. Mounting Pedestal: Galvanized steel with removable access panel.

### **2.02 MOTORS**

- A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
  - 1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.



- B. Enclosure Type: Totally enclosed, fan cooled.

### **2.03 SOURCE QUALITY CONTROL**

- A. Certify sound-power level ratings according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.
- B. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install power ventilators level and plumb.
- B. Secure roof-mounted fans to roof curbs with cadmium-plated hardware. See Section 077200 "Roof Accessories" for installation of roof curbs.
- C. Install units with clearances for service and maintenance.
- D. Label units according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

### **3.02 CONNECTIONS**

- A. Drawings indicate general arrangement of ducts and duct accessories.
- B. Install ducts adjacent to power ventilators to allow service and maintenance.

### **3.03 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
1. Verify that shipping, blocking, and bracing are removed.
  2. Verify that unit is secure on mountings and supporting devices, and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
  3. Verify that cleaning and adjusting are complete.
  4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
  5. Adjust belt tension.
  6. Adjust damper linkages for proper damper operation.
  7. Verify lubrication for bearings and other moving parts.
  8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
  9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
  10. Shut unit down and reconnect automatic temperature-control operators.
  11. Remove and replace malfunctioning units and retest as specified above.
- C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Prepare test and inspection reports.
-



### **3.04 ADJUSTING**

- A. Adjust damper linkages for proper damper operation.
- B. Adjust belt tension.
- C. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.
- D. Replace fan and motor pulleys as required to achieve design airflow.
- E. Lubricate bearings.

**END OF SECTION**



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**SECTION 23 3713**  
**DIFFUSERS, REGISTERS, AND GRILLES**  
**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
1. Fixed face grilles.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated, include the following:
1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
  2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.
- B. Samples for Initial Selection: For diffusers, registers, and grilles with factory-applied color finishes.
- C. Samples for Verification: For diffusers, registers, and grilles, in manufacturer's standard sizes to verify color selected.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
1. Ceiling suspension assembly members.
  2. Method of attaching hangers to building structure.
  3. Size and location of initial access modules for acoustical tile.
  4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
  5. Duct access panels.

**1.05 SOURCE QUALITY-CONTROL REPORTS.**

**PART 2 PRODUCTS**

**2.01 REGISTERS AND GRILLES**

- A. Fixed Face Grille:
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. Anemostat Products; a Mestek company.
    - b. Krueger.
    - c. Nailor Industries Inc.
    - d. Price Industries.
    - e. Titus.

**2.02 SOURCE QUALITY CONTROL**

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."



**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

**3.03 ADJUSTING**

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

**END OF SECTION**



**SECTION 23 5100  
BREECHINGS, CHIMNEYS, AND STACKS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Field fabricated breechings.
- B. Manufactured breechings.
- C. Draft regulators.
- D. Double wall metal stacks.
- E. Stationary auxiliary power generator engine exhaust piping.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 23 0513 - Common Motor Requirements for HVAC Equipment-CPL: Induced draft fan motor.
- C. Section 23 0716 - HVAC Equipment Insulation-CPL.
- D. Section 23 0719 - HVAC Piping Insulation-CPL.
- E. Section 26 3213 - Engine Generators: Exhaust silencer.

**1.03 REFERENCE STANDARDS**

- A. ANSI Z223.1 - National Fuel Gas Code 2021.
- B. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard 2020.
- C. ASME B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges 2021.
- D. ASME B31.9 - Building Services Piping 2020.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.
- F. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General - Purpose Piping 2014 (Reapproved 2020).
- G. ASTM A193/A193M - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications 2020.
- H. ASTM A194/A194M - Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both 2020a.
- I. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service 2019.
- J. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- L. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).
- M. NFPA 31 - Standard for the Installation of Oil Burning Equipment 2020.
- N. NFPA 54 - National Fuel Gas Code 2021.
- O. NFPA 82 - Standard on Incinerators and Waste and Linen Handling Systems and Equipment 2019.



- P. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances 2019.
- Q. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.
- R. UL 103 - Factory-Built Chimneys for Residential Type and Building Heating Appliances Current Edition, Including All Revisions.
- S. UL 378 - Standard for Draft Equipment Current Edition, Including All Revisions.
- T. UL 705 - Power Ventilators Current Edition, Including All Revisions.

#### **1.04 DEFINITIONS**

- A. Breeching: Vent connector.
- B. Chimney: Primarily vertical shaft enclosing at least one vent for conducting flue gases outdoors.
- C. Smoke Pipe: Round, single wall vent connector.
- D. Vent: That portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.
- E. Vent Connector: That part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent, and may include a draft control device.

#### **1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

#### **1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights, electrical characteristics and connection requirements.
- C. Designer's qualification statement.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Breechings, Chimneys, and Stacks:
  - 1. AMPCO by Hart & Cooley, Inc; Model VSI: [www.ampcostacks.com/#sle](http://www.ampcostacks.com/#sle).
  - 2. DuraVent; DuraStack Pro (DIS2): [www.duravent.com/#sle](http://www.duravent.com/#sle).
  - 3. Metal-Fab, Inc; [ ]: [www.mtlfab.com/#sle](http://www.mtlfab.com/#sle).
  - 4. Security Chimneys International; Secure Stack Pro (CIX2): [www.securitychimneys.com/#sle](http://www.securitychimneys.com/#sle).
  - 5. Selkirk Corporation; Model PS: [www.selkirkcommercial.com/#sle](http://www.selkirkcommercial.com/#sle).
  - 6. Z-Flex U.S. Inc; [ ]: [www.z-flex.com/#sle](http://www.z-flex.com/#sle).
  - 7. Basis-of-Design Product: Subject to compliance with requirements, provide The Schebler Company; PA Series or a comparable product .

#### **2.02 BREECHINGS, CHIMNEYS, AND STACKS - GENERAL REQUIREMENTS**

- A. Regulatory Requirements:
  - 1. Comply with applicable codes for installation of natural gas burning appliances and equipment.
  - 2. Comply with NFPA 31 for installation of oil burning appliances and equipment.
  - 3. Factory-built vents and chimneys used for venting natural draft appliances to comply with NFPA 211 and UL listed and labeled.



### 2.03 FIELD FABRICATED BREECHINGS

- A. Breechings 24 inches or More in Diameter: Fabricate from ASTM A1011/A1011M Type B carbon steel; weld longitudinal seams and make end joints by welding, lapping and bolting, or with companion flanges.
- B. Breechings Less Than 24 inches in Diameter: Fabricate from hot-dipped galvanized steel sheet, ASTM A653/A653M FS, with G90/Z275 coating; make longitudinal seams using pipe lock or flat lock groove seam and make end joints beaded and crimped.
- C. Minimum Metal Thicknesses based on SMACNA (DCS):
  - 1. Sizes up to 12 inches: 18 gauge, 0.0478 inch.
  - 2. Sizes 13 to 24 inches: 16 gauge, 0.0598 inch.
  - 3. Sizes 25 to 36 inches: 14 gauge, 0.0747 inch.
  - 4. Sizes 37 to 60 inches: 12 gauge, 0.1046 inch.
- D. Provide adjustable self-actuating barometric draft dampers, where indicated on drawings, full size of breeching.
- E. Provide cleanout doors of same gauge as breeching where indicated on drawings.
- F. Reinforcing: Provide angle frames for rectangular breeching and flanged girth joints or angle frames for round breeching in accordance with SMACNA (DCS), at following intervals:
  - 1. Sizes up to 30 inches: No reinforcing required.
  - 2. Sizes 31 to 36 inches: 1-1/2 by 1-1/2 by 3/16 inches, at 60 inch centers.
  - 3. Sizes 37 to 60 inches: 2 by 2 by 1/4 inch, at 60 inch centers.
  - 4. Sizes over 60 inches: 3 by 3 by 1/2 inch, at 60 inch centers.
- G. Fabricate breeching fittings to match adjoining breechings. Fabricate elbows with center-line radius equal to breeching width. Limit angular tapers to 20 degrees maximum.

### 2.04 MANUFACTURED BREECHINGS

- A. Provide factory-built, modular connector and manifold system, tested to UL 103 with positive pressure rating.
- B. Assembly to be UL listed for use with building equipment in compliance with NFPA 211.
- C. Fabricate with 1 inch minimum air space between walls and construct inner liner of 304 stainless steel and outer jacket of 304 stainless steel.
  - 1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.
- D. Design, fabricate, and install gas-tight preventing products of combustion leaking into the building.
  - 1. Securely connect inner joints and seal with factory supplied overlapping V-bands and appropriate sealant in accordance with manufacturer's instructions.
  - 2. System design to compensate for all flue gas induced thermal expansion.

### 2.05 DRAFT REGULATORS

- A. General Requirement: Comply with NFPA 54 and ANSI Z223.1.
  - B. Draft Regulator, Individual Appliance:
    - 1. Manufacturers:
      - a. Enervex, Inc; [ ]: [www.enervex.com/#sle](http://www.enervex.com/#sle)
      - b. US Draft Co, a division of RM Manifold Group, Inc; Connector Draft System (CDS): [www.usdraftco.com/#sle](http://www.usdraftco.com/#sle).
    - 2. Controller: Pressure modulating using external bidirectional static pressure sensor rated for minus 1 to 1 in-wc service.
    - 3. Regulator: 316 stainless steel single-blade butterfly damper (SBD) with edge seal, graphite bearings, and external 2-second stroke fast-acting modulating actuator.
    - 4. Chimney or Gas Vent Size: 4 inches.
-



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5. Service Temperature: 500 degrees F, maximum.
  6. Accessories: Provide encapsulated relay, gas-flow switch, and tubing with fittings.
- C. Draft Regulator, Manifolded Appliances:
1. Manufacturers:
    - a. Enervex, Inc; [ ]: [www.enervex.com/#sle](http://www.enervex.com/#sle)
    - b. US Draft Co, a division of RM Manifold Group, Inc; Overdraft Control System (ODCS): [www.usdraftco.com/#sle](http://www.usdraftco.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  2. Controller: Pressure modulating using external bidirectional static pressure sensor rated for minus 1 to 1 in-wc service.
  3. Regulator: 316 stainless steel opposed blade damper (OBD) with graphite bearings, and external 2-second stroke fast-acting modulating actuator.
  4. Manifold Duct Size: 8 inches.
  5. Service Temperature: 500 degrees F, maximum.
- D. Draft Inducer, Individual Appliance Vent:
1. Manufacturers:
    - a. US Draft Co, a division of RM Manifold Group, Inc; Vent Control Systems (VCS): [www.usdraftco.com/#sle](http://www.usdraftco.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
  2. Controller: Pressure modulating using external bidirectional static pressure sensor rated for minus 1 to 1 in-wc service.
  3. Fan Assembly: Comply with UL 378 and UL 705 listings and ratings.
  4. Maximum Service Temperature: 575 degrees F continuous duty and 750 degrees F intermittent duty.

## **2.06 SINGLE WALL METAL STACKS**

- A. Manufacturers:
1. Z-Flex U.S. Inc; Z-VENT Single Wall: [www.z-flex.com/#sle](http://www.z-flex.com/#sle).
  2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Provide single wall metal stacks, tested to UL 103 and UL listed with positive pressure rating, for use with building heating equipment, in compliance with NFPA 211.
- C. Fabricate with AL29-4C stainless steel.
1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.

## **2.07 DOUBLE WALL METAL STACKS**

- A. Provide double wall metal stacks, tested to UL 103 and UL listed with positive pressure rating, for use with building heating equipment, in compliance with NFPA 211.
- B. Fabricate with 1 inch minimum air space between walls and construct inner liner of 304 stainless steel and outer jacket of AL29-4C stainless steel.
1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.

## **2.08 STATIONARY AUXILIARY POWER GENERATOR ENGINE EXHAUST PIPING**

- A. Steel Pipe: ASTM A53/A53M, Schedule 40.
1. Fittings:
    - a. Buttweld in compliance with ASTM A234/A234M.
    - b. Wall thickness and material same as adjoining pipe.
    - c. Built-up miter welded fittings are acceptable where miter angles of each individual section do not exceed 22.5 degrees total and not more than 11.25 degrees relative to the axis of the pipe at any one cut.
-



2. Flanges:
    - a. Class 150, slip-on, forged steel welding flanges in accordance with ASME B16.5.
    - b. Material in accordance with ASTM A181/A181M, Grade I.
    - c. Provide for connections to engines, exhaust silencers, and flexible connections.
  3. Gaskets:
    - a. High temperature asbestos-free material suitable for the service.
    - b. ASME B16.21 composition ring, 0.0625 inch thick.
  4. Bolts: Alloy-steel, complying with ASTM A193/A193M, Grade B7, and of sufficient strength for full bearing on nuts, projecting not more than two full threads beyond the nut.
  5. Nuts: Alloy-steel, complying with ASTM A194/A194M, Grade 7.
  6. Provide stainless steel counterbalance type rain caps at exhaust pipe termination points.
- B. Flexible joints:
1. Provide flanged, multiple, corrugated, stainless steel (multi-ply) expansion joints with liners, between exhaust manifold and exhaust piping to absorb thermal expansion and vibration.
  2. Suitable for operation at 200 degrees F above normal exhaust gas temperature at 100 percent load, 10,000 cycles minimum.
  3. Design and construct for diesel engine exhaust application.
- C. Hangers and Supports: Provide hangers and supports that comply with MSS SP-58.
- D. Piping Sleeves:
1. Outside Walls Below and Above Grade, Floor, or Roof Slabs: Standard weight zinc coated pipe.
  2. Partitions: Zinc coated sheet steel having nominal weight of not less than 0.90 lb per square foot.
  3. Piping Insulation: Provide insulation in accordance with Section 23 0719.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
  - B. Install in accordance with NFPA 54
  - C. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.
  - D. Support breechings from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12 foot spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA (DCS) for equivalent duct support configuration and size.
  - E. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.
  - F. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
  - G. Insulate breechings in accordance with Section 23 0716.
  - H. For Type B double wall gas vents, maintain UL listed minimum clearances from combustibles. Assemble pipe and accessories as required for complete installation.
  - I. Install vent dampers, locating close to draft hood collar, and secured to breeching.
  - J. Assemble and install stack sections in accordance with NFPA 82, industry practices, and in compliance with UL listing. Join sections with acid-resistant joint cement. Connect base section to foundation using anchor lugs.
  - K. Level and plumb chimney and stacks.
  - L. Clean breechings, chimneys, and stacks during installation, removing dust and debris.
-



- M. At appliances, provide slip joints permitting removal of appliances without removal or dismantling of breechings, breeching insulation, chimneys, or stacks.
- N. Provide maximum 2 feet of breeching to connect appliance to chimney. Provide Type B chimney continuously from appliances.
- O. Engine Exhaust:
  - 1. Install engine exhaust piping in accordance with MSS SP-58 and ASME B31.9.
  - 2. Install exhaust silencer provided in accordance with Section 26 3213.
  - 3. Provide sleeves with sufficient length to pass through entire thickness of walls, floors, roofs, partitions, or slabs.
  - 4. Extend sleeves in floor slabs 2 inches above finished floor.
  - 5. Firmly pack insulation between pipe and sleeve and caulk both ends with plastic waterproof cement.
  - 6. Space Between Pipe Insulation and Sleeve: Not less than 0.25 inch thick.

### **3.02 SCHEDULES**

- A. Breechings, Chimneys and Stacks.
  - 1. Boiler: Steel breeching, Type B chimney.

**END OF SECTION**



**SECTION 23 5133**  
**– MONOLITHIC REFRACTORY CHIMNEY LINER**  
**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
1. Monolithic refractory chimney liners.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
1. Include construction details and material descriptions.

**1.04 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of venting system that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, structural failures caused by expansion and contraction.
  2. Warranty Period: 25 years from date of Substantial Completion.

**PART 2 PRODUCTS**

**2.01 MONOLITHIC REFRACTORY CHIMNEY LINERS**

- A. Manufacturer: Thermocrete, or approved equal
- B. Description: Lightweight Insulating Monolithic Refractory Chimney Lining Castable produced to B.S 4207 Tested to B.S.E.N.993/1902.

**TECHNICAL DATA**

TEST	MINIMUM	MAXIMUM	MEAN
Bulk Density	0.5g/cm <sup>3</sup>	1.5g/cm <sup>3</sup>	
Cold Crushing Strength	4/MPA		
Apparent Porosity	30%	90%	60%
Permanent Linear Change @ 1000 °C	0.25%	0.75%	0.5%
Refractoriness (P.C.E)	1306 °C	1380 °C	1343 °C
Thermal Conductivity @ 1000 °C	0.12W/mk	0.20W/mk	0.16W/mk
Thermal Resistance @ 1000 °C	5.0m <sup>2</sup> /kW	7.5m <sup>2</sup> /kW	
Resistance to Carbon Monoxide			100%

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of Work.
- B. Each chimney shall be inspected and measured in its entirety with a camera. A report shall be provided detailing dimensions, current conditions and any deficiencies.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.



**3.02 APPLICATION**

- A. Monolithic refractory chimney liners: Exhaust air relief or furnace vents in masonry chimney.

**3.03 INSTALLATION OF LISTED CHIMNEYS**

- A. Coordinate installation of roof curbs, duct openings, and roof penetrations.
- B. Comply with minimum clearances from combustibles and minimum termination heights according to product listing or NFPA 211, whichever is most stringent.

**3.04 CLEANING**

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes.
- B. Provide temporary closures at ends of chimneys and stacks that are not completed or connected to equipment.

**END OF SECTION**



**SECTION 23 5223  
CAST-IRON BOILERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Boilers.
- B. Controls and boiler trim.
- C. Steam and condensate connections.
- D. Hot water connections.
- E. Fuel connection.
- F. Collector, draft hood, and chimney connection.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete.
- B. Section 23 0913 - Instrumentation and Control Devices for HVAC.
- C. Section 23 2114 - Hydronic Specialties.
- D. Section 23 2214 - Steam and Condensate Heating Specialties.
- E. Section 23 5100 - Breechings, Chimneys, and Stacks.
- F. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

**1.03 REFERENCE STANDARDS**

- A. ANSI Z21.13 - American National Standard for Gas-Fired Low Pressure Steam and Hot Water Boilers 2017, with Errata (2018).
- B. ASME BPVC-IV - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers 2021.
- C. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels 2021.
- D. NFPA 31 - Standard for the Installation of Oil Burning Equipment 2020.
- E. NFPA 54 - National Fuel Gas Code 2021.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL (DIR) - Online Certifications Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating general layout, dimensions, and size and location of water, gas, and vent connections, and electrical characteristics and connection requirements.
- C. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.
- D. Manufacturer's Field Reports: Indicate condition of equipment after start-up including control settings and performance chart of control system.
- E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, cleaning procedures, replacement parts list, and maintenance and repair data.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.



## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect units before, during, and after installation from damage to casing by leaving factory shipping packaging in place until immediately prior to final acceptance.

## **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide a ten year pro-rated warranty for cast iron boiler sections.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Smith Cast Iron Boilers/Mestek, Inc; [ ]: [www.smithboiler.com/#sle](http://www.smithboiler.com/#sle).
- B. Slant/Fin Corporation; [ ]: [www.slantfin.com/#sle](http://www.slantfin.com/#sle).
- C. Weil-McLain/SPX Corporation; [ ]: [www.weil-mclain.com/#sle](http://www.weil-mclain.com/#sle).
- D. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 REGULATORY REQUIREMENTS**

- A. Comply with ASME BPVC-IV and ASME BPVC-VIII-1 for boiler construction.
- B. Comply with NFPA 70.
- C. Comply with applicable codes for internal wiring of factory wired equipment.
- D. Units: UL (DIR) listed and labeled.
- E. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

### **2.03 MANUFACTURED UNITS**

- A. Steam Boilers: Suitable for natural draft with insulated jacket, sectional cast iron heat exchanger, natural gas and fuel oil burning system, refractory, controls, and boiler trim.
- B. Provide water wall design consisting of water backed combustion area with water circulating around firebox. Refractory chamber or separate base not required.

### **2.04 FABRICATION**

- A. Assembly: Cast iron sections with 15 psi steam ASME Boilers and Pressure Vessels Code rating, assembled with push nipples or gaskets and draw rods.
- B. Access: To flue passages for cleaning and flame observation ports.
- C. Structural Base: Aluminized steel lined with high temperature mineral fiber insulating panels.
- D. Jacket: Glass fiber insulated steel jacket, finished with factory applied baked enamel.

### **2.05 STEAM BOILER TRIM**

- A. ASME rated pressure relief valve, 15 psig.
- B. Steam pressure gauge, 0 to 30 psig.
- C. Water column gauge glass set with cocks.
- D. Low water cut-off to prevent burner operation when boiler water drops below safe level and boiler condensate return pump control to maintain water level by controlling pump operation.
- E. Operating pressure controller for burner to maintain steam pressure setting.
- F. High limit pressure control with manual reset for burner to prevent steam pressure from exceeding system pressure.

### **2.06 FUEL BURNING SYSTEM**

- A. Burner Operation: Modulating with low fire position for ignition.
-



- B. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after air flow proven and slight delay, allow gas valve to open.
- C. Combination Gas-Oil Burner: Burner for natural gas and No. 2 fuel oil built as unit, equipped with gas pressure regulator and oil gas selector switch.
- D. Collector and Draft Hood: Non-metallic vent pipe and air intake.
- E. Controls: Pre-wired, factory assembled electronic controls in control cabinet with flame scanner or detector, programming control, relays, and switches. Provide pre-purge and post-purge ignition and shut-down of burner in event of ignition pilot and main flame failure with manual reset.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install boiler on concrete housekeeping base, sized minimum 4 inches larger than boiler base. Refer to Section 03 3000.
- C. Provide connection of natural gas service in accordance with requirements of NFPA 54 and applicable codes.
- D. Provide connection to fuel oil supply in accordance with requirements of NFPA 31.
- E. Provide piping connections and accessories as indicated; refer to Section 23 2114.
- F. Pipe relief valves to nearest floor drain.
- G. Provide for connection to electrical service. Refer to Section 26 0583.

#### **3.02 SYSTEM STARTUP**

- A. Provide the services of manufacturer's field representative for starting and testing unit.

#### **3.03 CLOSEOUT ACTIVITIES**

- A. Train operating personnel in operation and maintenance of units.
- B. Provide the services of the manufacturer's field representative to conduct training.

**END OF SECTION**



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**SECTION 23 7413**  
**PACKAGED OUTDOOR CENTRAL-STATION AIR-HANDLING UNITS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Packaged roof top unit.
- B. Roof mounting curb and base.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0913 - Instrumentation and Control Devices for HVAC: Control components, time clocks.
- B. Section 26 0583 - Wiring Connections: Installation and wiring of thermostats and other controls components; wiring from unit terminal strip to remote panel.
- C. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

**1.03 REFERENCE STANDARDS**

- A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment 2023.
- B. AHRI 270 - Sound Performance Rating of Outdoor Unitary Equipment 2015, with Addendum.
- C. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect units from physical damage by storing off site until roof mounting curbs are in place, ready for immediate installation of units.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five year warranty to include coverage for refrigeration compressors.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Carrier, a part of UTC Building and Industrial Systems, a unit of United Technologies Corp; [\_\_\_\_]: [www.carrier.com/#sle](http://www.carrier.com/#sle).
- B. Trane, a brand of Ingersoll Rand; [\_\_\_\_]: [www.trane.com/#sle](http://www.trane.com/#sle).
- C. York International Corporation/Johnson Controls Inc; [\_\_\_\_]: [www.johnsoncontrols.com/#sle](http://www.johnsoncontrols.com/#sle).
- D. Daikin.

**2.02 MANUFACTURED UNITS**

- A. General: Roof mounted units having gas burner and electric refrigeration.
-



- B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, heat recovery coil, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

### **2.03 FABRICATION**

- A. Cabinet: Steel with baked enamel finish, including access panels with screwdriver operated flush cam type fasteners. Structural members shall be minimum 18 gauge, 0.0478 inch, with access doors or panels of minimum 20 gauge, 0.0359 inch.
- B. Insulation: 2 inch thick neoprene coated glass fiber with edges protected from erosion.
- C. Heat Exchangers: Aluminized steel, of welded construction.
- D. Supply and Return Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch pulley, and rubber isolated hinge mounted high efficiency motor or direct drive as indicated. Isolate complete fan assembly. Refer to Section 23 0548.
- E. Air Filters:
- F. Roof Mounting Curb: 14 inches high galvanized steel, channel frame with gaskets, nailer strips.

### **2.04 EVAPORATOR COIL**

- A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.
- B. Provide capillary tubes or thermostatic expansion valves for units of 6 tons capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons cooling capacity and larger.

### **2.05 COMPRESSOR**

- A. Provide hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and filter drier.

### **2.06 CONDENSER COIL**

- A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.
- B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

### **2.07 HEAT RECOVERY COIL**

- A. Provide copper tube aluminum fin coil assembly with multiple circuits arranged to provide heat recovery.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that proper power supply is available.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Mount units on factory built roof mounting curb providing watertight enclosure to protect ductwork and utility services. Install roof mounting curb level.

### **3.03 SYSTEM STARTUP**

- A. Prepare and start equipment. Adjust for proper operation.

### **3.04 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
-



- B. See Section 01 7900 - Demonstration and Training, for additional requirements.

**END OF SECTION**



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**SECTION 23 8200**  
**CONVECTION HEATING AND COOLING UNITS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Finned tube radiation.
- B. Convectors.
- C. Cabinet unit heaters.
- D. Fan-coil units.
- E. Radiant radiators.
- F. Radiator valves.
- G. Radiator valve thermostats - non-electric.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0513 - Common Motor Requirements for HVAC Equipment-CPL.
- B. Section 23 0716 - HVAC Equipment Insulation-CPL.
- C. Section 23 0719 - HVAC Piping Insulation-CPL.
- D. Section 23 0913 - Instrumentation and Control Devices for HVAC.
- E. Section 23 0993 - Sequence of Operations for HVAC Controls.
- F. Section 23 2213 - Steam and Condensate Heating Piping.
- G. Section 23 2214 - Steam and Condensate Heating Specialties.
- H. Section 23 3100 - HVAC Ducts and Casings.
- I. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.  
Installation of room thermostats. Electrical supply to units.

**1.03 REFERENCE STANDARDS**

- A. AHRI Directory of Certified Product Performance - Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Current Edition.
- B. AHRI 350 - Sound Performance Rating of Non-Ducted Indoor Air-Conditioning and Heat Pump Equipment 2015.
- C. AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils 2001, with Addenda (2011).
- D. AHRI 440 - Performance Rating of Room Fan-Coils 2008.
- E. ASHRAE (HVAC) - ASHRAE Handbook - HVAC Applications Most Recent Edition Cited by Referring Code or Reference Standard.
- F. ASHRAE Std 62.1 - Ventilation for Acceptable Indoor Air Quality Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- I. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.
- J. UL 674 - Electrical Motors and Generators for Use in Hazardous (Classified) Locations Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Provide typical catalog of information including arrangements.
-



- 
- C. Shop Drawings:
    - 1. Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations.
    - 2. Indicate air coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions.
    - 3. Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers, and comparison of specified heat required to actual heat output provided.
    - 4. Indicate mechanical and electrical service locations and requirements.
  - D. Certificates: Certify that coils are tested and rated in accordance with AHRI 410.
  - E. Manufacturer's Instructions: Indicate installation instructions and recommendations.
  - F. Project Record Documents: Record actual locations of components and locations of access doors in radiation cabinets required for access or valving.
  - G. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.
  - H. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

#### 1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

### PART 2 PRODUCTS

#### 2.01 FAN-COIL UNITS

- A. Manufacturers:
    - 1. Vertical Cabinet, Horizontal Exposed, or Horizontal Recessed:
      - a. Carrier, a part of UTC Building and Industrial Systems, a unit of United Technologies Corp; [ ]: [www.commercial.carrier.com/#sle](http://www.commercial.carrier.com/#sle).
      - b. Daikin Applied; [ ]: [www.daikinapplied.com/#sle](http://www.daikinapplied.com/#sle).
      - c. Krueger-HVAC; [ ]: [www.krueger-hvac.com/#sle](http://www.krueger-hvac.com/#sle).
      - d. Trane, a brand of Ingersoll Rand; [ ]: [www.trane.com/#sle](http://www.trane.com/#sle).
  - B. Performance Data and Safety Requirements:
    - 1. Unit capacities certified in accordance with AHRI 440.
    - 2. Provide products listed, classified, and labeled by Underwriters Laboratories Inc. (UL), Intertek (ETL), or testing firm acceptable to Authority Having Jurisdiction as suitable for the purpose indicated.
    - 3. Insulation to comply with NFPA 90A requirements for flame spread and smoke generation.
    - 4. Equipment wiring to comply with requirements of NFPA 70.
  - C. Required Directory Listings: AHRI Directory of Certified Product Performance - Air-Conditioning, Heating, and Refrigeration Institute (AHRI).
  - D. Coils:
    - 1. Evenly spaced aluminum fins mechanically bonded to copper tubes.
    - 2. Water Coil: Suitable for working temperatures not less than 200 degrees F.
    - 3. Steam Coil: Suitable for working pressures not less than 15 psi.
    - 4. Provide drain pan under cooling coil easily removable for cleaning.
  - E. Vertical Cabinet and Horizontal Exposed Units: Minimum 18 gauge, 0.0478 inch thick sheet steel with exposed corners and edges rounded, easily removed panels, glass fiber insulation, integral air outlet, and inlet grilles.
-



- 
- F. Horizontal Recessed Units:
    - 1. Provide with a galvanized steel cabinet, easily removed panels, glass fiber insulation, integral air outlet, and inlet grilles with minimum 18 gauge, 0.0478 inch thick sheet steel bottom panel.
    - 2. Ducted Units: Provide with air inlet and outlet duct collars.
  - G. Finish: Factory applied baked enamel of color as selected on visible surfaces of enclosure or cabinet.
  - H. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven.
  - I. Motor: Tap wound multiple speed permanent split capacitor with sleeve bearings, resiliently mounted.
  - J. Controls:
    - 1. Provide units with control valves furnished by the fan coil unit manufacturer.
    - 2. Fan Coil Unit Manufacturer's Controls:
      - a. Fan speed switch for unit mounting.
      - b. Disconnect switch.
      - c. Thermostats and controllers.
    - 3. Controls Interface:
      - a. Relay board.
      - b. Inverting relays for use with standard thermostats and normally open valves.
  - K. Filter: Easily removed 1 inch thick glass fiber throw-away type, located to filter air before coil.
  - L. Electrical Characteristics:
    - 1. As scheduled W.
    - 2. Refer to Section 26 0583.

## 2.02 RADIANT RADIATORS:

- A. Manufacturers:
  - 1. OCS Industries, a Division of the CIDC Corporation; [\_\_\_\_]: [www.ocsind.com/#sle](http://www.ocsind.com/#sle).
  - 2. U.S. Boiler Company, Inc; [\_\_\_\_]: [www.usboiler.net/#sle](http://www.usboiler.net/#sle).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Construction:
  - 1. Durable cast iron and sectional design.
  - 2. Factory designed for surface mounting or recessed for cabinets and other structures.
  - 3. Heating surface based on standard heat emission rate of 240 Btu per sq ft-hr.
- C. Operation: Designed to draw cool air in through the bottom and project warm air out through top ports by combining convection with radiant heat.
- D. Tappings:
  - 1. All Air Vent Tappings: 1/8 inch.
  - 2. All Bottom Tappings: 1/4 inch.
- E. Maximum Working Pressure:
  - 1. Steam: 15 psi.

## 2.03 RADIATOR VALVES

- A. Angle, straight, or reversed angle pattern, rising stem, inside screw globe valve for 145 psi working pressure, with bronze body and integral union for screwed connections, renewable composition disc, plastic wheel handle for shut-off service, and lockshield key cap and set screw memory bonnet for balancing service.
-



**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that surfaces are suitable for installation.
- B. Verify that field measurements are as indicated on drawings.

**3.02 INSTALLATION**

- A. Install in accordance with manufacturer's recommendations.
- B. Install equipment exposed to finished areas after walls and ceilings are finished and painted.
- C. Do not damage equipment or finishes.
- D. Baseboard Radiation:
  - 1. Locate on outside walls and run cover continuously wall-to-wall unless otherwise indicated.
  - 2. Center elements under window with elements of equal length centered under each window for multiple windows.
  - 3. Install end caps where units butt against walls.
- E. Finned Tube Radiation:
  - 1. Locate on outside walls and run cover continuously wall-to-wall unless otherwise indicated.
  - 2. Center elements under window with elements of equal length centered under each window for multiple windows.
  - 3. Install wall angles and end caps where units butt against walls.
  - 4. Align cabinet joints with window mullions.
  - 5. Install wall angles where units butt against walls and align cabinet joints with window mullions.
- F. Convectors:
  - 1. Install where indicated.
  - 2. Coordinate to ensure correct recess size for recessed convectors.
- G. Unit Heaters:
  - 1. Hang from building structure, with pipe hangers anchored to building, not from piping or electrical conduit.
  - 2. Mount as high as possible to maintain greatest headroom unless otherwise indicated.
- H. Cabinet Unit Heaters:
  - 1. Install as indicated.
  - 2. Coordinate to ensure correct recess size for recessed units.
- I. Fan-Coil Units:
  - 1. Install as indicated.
  - 2. Coordinate to ensure correct recess size for recessed units.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.

**3.04 CLEANING**

- A. After construction and painting is completed, clean exposed surfaces of units.
  - B. Vacuum clean coils and inside of units.
  - C. Touch-up marred or scratched surfaces of factory-finished cabinets using finish materials furnished by the manufacturer.
  - D. Install new filters.
-



**3.05 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. See Section 01 7900 - Demonstration and Training, for additional requirements.

**END OF SECTION**



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**SECTION 23 8216  
AIR COILS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Steam coils.

**1.02 RELATED REQUIREMENTS**

- A. Section 23 0719 - HVAC Piping Insulation-CPL.
- B. Section 23 2114 - Hydronic Specialties.
- C. Section 23 2214 - Steam and Condensate Heating Specialties.
- D. Section 23 2300 - Refrigerant Piping.
- E. Section 23 3100 - HVAC Ducts and Casings: Installation of duct coils.

**1.03 REFERENCE STANDARDS**

- A. AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils 2001, with Addenda (2011).
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions.
- C. Shop Drawings: Indicate coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions.
- D. Certificates: Certify that coil capacities, pressure drops, and selection procedures meet or exceed specified requirements.
- E. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors.
- B. Protect coils from entry of dirt and debris with pipe caps or plugs.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for steam coils.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Aerofin Corporation; [\_\_\_\_]: [www.aerofin.com/#sle](http://www.aerofin.com/#sle).
- B. Luvata UK Ltd; [\_\_\_\_]: [www.luvata.com/#sle](http://www.luvata.com/#sle).
- C. Trane, a brand of Ingersoll Rand; [\_\_\_\_]: [www.trane.com/#sle](http://www.trane.com/#sle).
- D. Daikin.



## **2.02 STEAM HEATING COILS**

- A. Tubes: 5/8 inch OD seamless copper or brass arranged in parallel or staggered pattern, expanded into fins, silver brazed joints.
- B. Fins: Aluminum or copper continuous plate type with full fin collars.
- C. Casing: Die formed channel frame of 16 gauge, 0.0598 inch galvanized steel with 3/8 inch mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.
- D. Headers: Cast iron with tubes expanded into header.
- E. Testing: Air test under water to 200 psi for working pressure of 200 psi and 220 degrees F.
- F. Configuration: Drainable, with threaded plugs in headers for drain and vent, threaded plugs in return bends and in headers opposite each tube, sloped within frame to condensate connection.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with manufacturer's written instructions.
- B. Install in ducts and casings in accordance with SMACNA (DCS).
  - 1. Support coil sections independent of piping on steel channel or double angle frames and secure to casings.
  - 2. Provide frames for maximum three coil sections.
  - 3. Arrange supports to avoid piercing drain pans.
  - 4. Provide airtight seal between coil and duct or casing.
  - 5. Refer to Section 23 3100.
- C. Protect coils to prevent damage to fins and flanges. Comb out bent fins.
- D. Install coils level. Install cleanable tube coils with 1:50 pitch.
- E. Make connections to coils with unions and flanges.
- F. Hydronic Coils:
  - 1. Hydronic Coils: Connect water supply to leaving air side of coil (counterflow arrangement).
  - 2. Ensure water coils are drainable and provide drain connection at low points.
- G. Steam Coils:
  - 1. Install vacuum breaker in steam line at or in header.
  - 2. Install steam traps with outlet minimum 12 inches below coil return connection.
  - 3. Refer to Section 23 2214.
- H. Refrigerant Coils: Provide sight glass in liquid line within 12 inches of coil. Refer to Section 23 2300.
- I. Insulate headers located outside air flow as specified for piping. Refer to Section 23 0719.

**END OF SECTION**



**SECTION 26 0000**  
**– GENERAL PROVISIONS FOR ELECTRICAL WORK**  
**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. The work included in this Contract is shown on the drawings and described in these specifications. It consists of furnishing all labor, material, services, supervision and connection of all systems shown and/or specified including the requirements of:

**1.02 0 - BIDDING AND CONTRACT REQUIREMENTS****1 - GENERAL REQUIREMENTS****26 - ELECTRICAL****3.01 CONTRACTOR IS RESPONSIBLE TO REVIEW AND UNDERSTAND ALL DRAWINGS AND ALL WORK OF ALL TRADES TO ENSURE A COMPLETE AND THOROUGH PROJECT.**



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- 3.02 PROVIDE ALL LABOR, TOOLS, MATERIALS, EQUIPMENT, COORDINATION, AND PLANS NECESSARY FOR INSTALLATION AND PROPER OPERATION OF THE ELECTRICAL SYSTEMS.**
- 3.03 CONTRACT DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY AND MUST BE SO USED TO ASCERTAIN ALL REQUIREMENTS OF THE WORK.**
- 3.04 DEFINITIONS**
- 3.05 PROVIDE, FURNISH, INSTALL, AND FURNISH AND INSTALL SHALL HAVE THE SAME MEANING. THAT IS, THE CONTRACTOR SHALL PURCHASE, TRANSPORT TO THE SITE AND INSTALL ALL REQUIRED COMPONENTS OF THE WORK UNLESS SPECIFICALLY STATED OTHERWISE IN THE CONTRACT DOCUMENTS.**
- 3.06 WIRING PERTAINS TO RACEWAY, FITTINGS, CONDUCTORS, TERMINATIONS, HANGERS, SUPPORTS, ETC. AS REQUIRED TO FORM A COMPLETE SYSTEM.**
- 3.07 DRAWINGS AND SPECIFICATIONS**
- 3.08 THE PLANS ARE DIAGRAMMATIC AND INDICATE ONLY THE SIZES AND GENERAL ARRANGEMENT OF CONDUIT, DEVICES, AND EQUIPMENT; EXACT LOCATIONS OF ALL ELEMENTS SHALL BE DETERMINED AS WORK PROGRESSES, IN COOPERATION WITH THE WORK OF OTHER TRADES. IT IS NOT INTENDED TO SHOW EVERY ITEM OF WORK OR MINOR PIECE OF EQUIPMENT, BUT EVERY ITEM SHALL BE FURNISHED AND INSTALLED WITHOUT ADDITIONAL REMUNERATION AS NECESSARY TO COMPLETE THE SYSTEM IN ACCORDANCE WITH THE BEST PRACTICE OF THE TRADE.**
- 3.09 AS PREVIOUSLY STATED, THE EXACT LOCATIONS OF ELECTRICAL DEVICES AND EQUIPMENT IS DIAGRAMMATIC. THE OWNER MAY REQUEST FOR ANY DEVICES OR EQUIPMENT TO BE INSTALLED AT DIFFERENT LOCATIONS THAN WHAT IS INDICATED ON THE DRAWINGS IN A SPECIFIC AREA OR ROOM. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO COORDINATE THE LOCATIONS OF DEVICES IN ALL AREAS PRIOR TO INSTALLATION.**
- 3.10 APPLICABLE STANDARDS**
- 3.11 ALL EQUIPMENT SHALL BEAR THE UL LABEL.**
- 3.12 THE LATEST EDITION OF THE FOLLOWING MINIMUM STANDARDS SHALL APPLY WHEREVER APPLICABLE:**
- 3.13 AMERICAN STANDARDS ASSOCIATION**
- 3.14 INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS**
- 3.15 INSULATED POWER CABLE FOR ENGINEERS ASSOCIATION**
- 3.16 OCCUPATIONAL SAFETY AND HEALTH ACT**
- 3.17 NATIONAL ELECTRIC CODE**
- 3.18 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION**
- 3.19 NATIONAL ELECTRICAL SAFETY CODE**
- 3.20 NATIONAL FIRE PROTECTION ASSOCIATION**
- 3.21 UNDERWRITERS LABORATORIES, INC.**
- 3.22 POWER COMPANY STANDARDS AND REGULATIONS.**
- 3.23 LOCAL AND STATE CODES.**
- 3.24 IN THE EVENT THERE ARE CONFLICTS BETWEEN SPECIFICATIONS AND STANDARDS, STANDARDS SHALL GOVERN UNLESS SPECIFICATIONS ARE IN EXCESS OF STANDARDS.**
- 3.25 PERMITS AND INSPECTIONS**
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- 3.26 PERMITS: THE CONTRACTOR SHALL APPLY FOR AND PAY THE COST FOR ANY LOCAL PERMITS NECESSARY FOR THE WORK OF THIS CONTRACT.**
- 3.27 INSPECTIONS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING INSPECTION OF AND THE CERTIFICATE BY A 3RD PARTY INSPECTION AGENCY FOR THE ENTIRE ELECTRICAL SYSTEM. TURN OVER CERTIFICATE OF INSPECTION TO THE ARCHITECT.**
- 3.28 THE UNDERTAKING OF PERIODIC INSPECTIONS BY THE OWNER OR ENGINEER SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION. THE OWNER OR ENGINEER IS NOT RESPONSIBLE FOR PROVIDING A SAFE PLACE OF WORK FOR THE CONTRACTOR, CONTRACTOR'S EMPLOYEES, SUPPLIERS OR SUBCONTRACTORS FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.**
- 3.29 CODES AND REGULATIONS**
- 3.30 COMPLY WITH ALL APPLICABLE RULES AND REGULATIONS OF THE MUNICIPAL LAWS AND ORDINANCES AND LATEST REVISIONS THEREOF. ALL WORK SHALL BE DONE IN FULL CONFORMITY WITH THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION. MODIFICATIONS REQUIRED BY THE ABOVE AUTHORITIES WILL BE MADE WITHOUT ADDITIONAL CHARGES TO THE OWNER. WHERE ALTERATIONS TO AND/OR DEVIATIONS FROM THE CONTRACT DOCUMENTS ARE REQUIRED BY THE AUTHORITIES, REPORT THE REQUIREMENTS TO THE ENGINEER AND SECURE APPROVAL BEFORE WORK IS STARTED.**
- 3.31 FURNISH AND FILE WITH THE PROPER AUTHORITIES, ALL DRAWINGS REQUIRED BY THEM IN CONNECTION WITH THE WORK. OBTAIN ALL PERMITS, LICENSES, AND INSPECTIONS AND PAY ALL LEGAL AND PROPER FEES AND CHARGES IN THIS CONNECTION.**
- 3.32 SHOULD ANY WORK SHOWN OR SPECIFIED BE OF LIGHTER OR SMALLER MATERIAL THAN CODE REQUIRES, SAME SHALL BE EXECUTED IN STRICT ACCORDANCE WITH THE REGULATIONS.**
- 3.33 HEAVIER OR LARGER SIZE MATERIAL THAN CODE REQUIRES SHALL BE FURNISHED AND INSTALLED, IF REQUIRED BY THE PLANS AND SPECIFICATIONS.**
- 3.34 THIS CONTRACTOR SHALL HAVE THE ELECTRICAL WORK INSPECTED FROM TIME TO TIME BY AUTHORIZED INSPECTORS AND SHALL PAY ALL EXPENSE INCURRED BY SAME. AT THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL FURNISH A CERTIFICATE OF APPROVAL, IN TRIPPLICATE, INDICATING FULL APPROVAL OF THE WORK FURNISHED AND INSTALLED IN THIS CONTRACT FROM THE LOCAL AUTHORITY HAVING JURISDICTION.**
- 3.35 EQUIPMENT AND COMPONENTS PARTS THEREOF SHALL BEAR MANUFACTURER'S NAME-PLATE, GIVING MANUFACTURER'S NAME, SIZE, TYPE AND MODEL NUMBER OR SERIAL NUMBER, ELECTRICAL CHARACTERISTIC TO FACILITATE MAINTENANCE AND REPLACEMENTS. NAME PLATES OF DISTRIBUTORS OR CONTRACTORS ARE NOT ACCEPTABLE.**
- 3.36 ENGINEER WILL HAVE PRIVILEGE OF STOPPING ANY WORK OR USE OF ANY MATERIAL THAT IN HIS OPINION IS NOT BEING PROPERLY INSTALLED AND EACH CONTRACTOR SHALL REMOVE ALL MATERIALS DELIVERED, OR WORK ERECTED, WHICH DOES NOT COMPLY WITH CONTRACT DRAWINGS AND SPECIFICATIONS, AND REPLACE WITH PROPER MATERIALS, OR CORRECT SUCH WORK AS DIRECTED BY THE ENGINEER, AT NO ADDITIONAL COST TO OWNER.**
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**3.37 IF EQUIPMENT OR MATERIALS ARE INSTALLED BEFORE PROPER APPROVALS HAVE BEEN OBTAINED, EACH CONTRACTOR SHALL BE LIABLE FOR THEIR REMOVAL AND REPLACEMENT INCLUDING WORK OF OTHER TRADES AFFECTED BY SUCH WORK, AT NO ADDITIONAL COST TO OWNER, IF SUCH ITEMS DO NOT MEET INTENT OF THE DRAWINGS AND SPECIFICATIONS.**

**3.38 RECORD DRAWINGS**

**3.39 THE ELECTRICAL CONTRACTOR SHALL KEEP AN ACCURATE LOCATION RECORD OF ALL UNDERGROUND AND CONCEALED PIPING, AND OF ALL CHANGES FROM THE ORIGINAL DESIGN. HE IS REQUIRED TO FURNISH THIS INFORMATION TO THE ENGINEER PRIOR TO HIS APPLICATION FOR FINAL PAYMENT.**

- A. Submit prior to final acceptance inspection, one complete marked-up set of reproducible engineering design drawings.
  - 1. Fully illustrate all revisions made by all crafts in course of work.
  - 2. Include all field changes, adjustments, variances, substitutions and deletions, including all Change Orders.
  - 3. Exact location of raceways, equipment and devices.
  - 4. Exact size and location of underground and under floor raceways, grounding conductors and duct banks.
- B. These drawings shall be for record purposes for Owner's use and are not considered shop drawings.



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- 3.40 AT COMPLETION OF THE PROJECT, ALL CHANGES AND DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE RECORDED BY THE CONTRACTOR.**
- 3.41 FOUR (4) CORRECTED SETS OF ALL OPERATING AND MAINTENANCE INSTRUCTIONS AND COMPLETE PARTS LISTS BOUND IN HARD COVERS SHALL BE FURNISHED TO THE OWNER.**
- 3.42 CLEANING CONDUIT AND EQUIPMENT**
- 3.43 CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS, AND OTHER FOREIGN SUBSTANCES.**
- 3.44 VIBRATION ISOLATION**
- 3.45 VIBRATION ISOLATORS SHALL PREVENT, AS FAR AS PRACTICABLE, TRANSMISSION OF VIBRATION, NOISE OR HUM TO ANY PART OF BUILDING.**
- 3.46 WIRING AND OTHER ELECTRICAL CONNECTIONS TO EQUIPMENT MOUNTED ON VIBRATION ISOLATORS; MADE FLEXIBLE WITH MINIMUM 180 DEGREE LOOP OF "GREENFIELD" IN ORDER TO AVOID RESTRAINING EQUIPMENT AND SHORT CIRCUITING VIBRATION ISOLATOR.**
- 3.47 BALANCED LOAD**
- 3.48 IT IS INTENDED THAT DESIGN AND FEATURES OF THE WORK AS INDICATED WILL PROVIDE BALANCED LOAD ON THE FEEDERS AND MAIN SERVICE. CONTRACTOR SHALL PROVIDE MATERIAL AND INSTALLATION TO PROVIDE THIS BALANCE LOAD INSOFAR AS POSSIBLE.**
- 3.49 CONTRACTOR SHALL TAKE CURRENT AND VOLTAGE MEASUREMENTS AT ALL PANELS OF AT LEAST 1/2 HOUR. RECONNECTIONS OF LOADS SHALL BE MADE WHEN DEEMED NECESSARY BY THE ENGINEERS.**
- 3.50 JOB CONDITIONS**
- 3.51 EXAMINE SITE RELATED WORK AND SURFACES BEFORE STARTING WORK OF ANY SECTION. FAILURE TO DO SO SHALL IN NO WAY RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PROPERLY INSTALL THE NEW WORK.**
- A. Report to the Engineer, in writing, conditions, which will prevent proper provision of this work ten (10) days prior to bid date, in time for an addendum to be issued .
  - B. Beginning work of any Section without reporting unsuitable conditions to the Engineer constitutes acceptance of conditions by the Contractor.
  - C. Perform any required removal, repair or replacement of this work caused by unsuitable conditions at no additional cost to Owner.
  - D. The Contractor is responsible for performing routine maintenance and cleaning of any existing equipment where he is making connections to new work and to the building where his work adds debris.
- 3.52 CONNECTIONS TO EXISTING WORK:**
- A. Install new work and connect to existing work with minimum interference to existing facilities.
  - B. Provide temporary shutdowns of existing services only with written consent of Owner at no additional charges and at time not to interfere with normal operation of existing facilities.
  - C. Maintain continuous operation of existing facilities as required with necessary temporary connections between new and existing work.
  - D. Do not interrupt alarm and emergency systems.
  - E. Connect new work to existing work in neat and acceptable manner.
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- F. Restore existing disturbed work to original condition including maintenance of wiring and continuity as required. Replace damaged or rusted conduit to which new equipment is being installed and connected.

**3.53 REMOVAL AND RELOCATION OF EXISTING WORK.**

- A. Disconnect, remove or relocate electrical material, equipment and other work noted and required by removal or changes in existing construction.
- B. Provide new material and equipment required for relocated equipment.
- C. Disconnect load and line end of conductors feeding existing equipment.
- D. Remove conductors from existing raceways to be rewired.
- E. Remove conductors and cap outlets on raceways to be abandoned.
- F. Dispose of removed raceways and wire.
- G. Dispose of removed electrical equipment as directed by Owner. The Owner shall provide a list of equipment of the Contractor of equipment to be delivered to the Owner.

**3.54 SPECIAL TOOLS AND LOOSE ITEMS**

**3.55 FURNISH TO OWNER AT COMPLETION OF WORK:**

- A. One set of any special tools required to operate, adjust, dismantle or repair equipment furnished under any section of this Division.
- B. "Special Tools": Those not normally found in possession of maintenance personnel.
- C. Keys
- D. Redundant components and spare parts.

**3.56 DELIVER ITEMS TO OWNER AND OBTAIN RECEIPT PRIOR TO APPROVAL OF FINAL PAYMENT.**

**3.57 REVIEW OF CONSTRUCTION**

**3.58 WORK MAY BE REVIEWED AT ANY TIME BY REPRESENTATIVE OF THE ENGINEER.**

**3.59 ADVISE ARCHITECT AND ENGINEER THAT WORK IS READY FOR REVIEW AT FOLLOWING TIMES:**

- A. Prior to backfilling buried work.
- B. Prior to concealment of work in walls and above ceilings.
- C. When all requirements of contract have been completed.



**3.60 NEITHER BACKFILL NOR CONCEAL WORK WITHOUT ENGINEER'S CONSENT.**

**3.61 SHOP DRAWING SUBMITTALS**

**3.62 SUBMIT REQUIRED SHOP DRAWINGS, SAMPLES AND PRODUCT INFORMATION IN ACCORDANCE WITH DIVISION 1, REQUIREMENTS AND AS REQUIRED IN THE VARIOUS SECTIONS OF THESE SPECIFICATIONS.**

**3.63 SUBMITTALS SHALL SHOW EVIDENCE OF CHECKING BY THE CONTRACTOR FOR ACCURACY. PRODUCT INFORMATION (CATALOG SHEETS) SHALL INDICATE COMPLETE CATALOG NUMBER, COLOR, ACCESSORIES, ETC., AS WELL AS, NAME OF MANUFACTURER AND LOCAL DISTRIBUTOR OR MANUFACTURER'S REPRESENTATIVE.**

**3.64 SUBMIT FOR REVIEW DETAILED COORDINATION DRAWINGS 3/8" OR LARGER SCALE PLANS FOR ALL MAJOR ELECTRICAL EQUIPMENT AND ANY AREAS OF CONFLICTS BY DRAFTING LOCATION OF EQUIPMENT, LIGHTING FIXTURES, CABLE TRAYS AND CONDUITS LARGER THAN 1-1/2" TRADE SIZE. CONTRACTOR SHALL REFER TO DIVISION 1 FOR PREPARING COORDINATION DRAWINGS.**

**3.65 INCOMPLETE SUBMITTALS WILL BE REJECTED.**

**3.66 ADDITIONALLY, THE CONTRACTOR WILL SUBMIT DATA ON THE FOLLOWING:**

- A. All electrical equipment including all panelboards and switching devices (disconnects, switches, occupancy sensors, etc.).
- B. Fire stop seals used for wall penetrations.
- C. Any proposed variation in specified wiring plans and circuitry.
- D. All special items and panels, made or constructed specifically for this project, including wiring diagrams, component layout and component data or materials list.
- E. All settings of installed equipment, such as overcurrent protection, overload settings, temperature settings, time settings, etc. This includes equipment provided by other contractors or subcontractors and connected and tested by this Contractor.



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**3.67 ALL SUBMITTALS OF NON SPECIFIED EQUIPMENT AND COMPONENTS WILL BE REVIEWED. IT IS THE SUBMITTING CONTRACTOR'S RESPONSIBILITY TO PROVE COMPLIANCE AND NOT THE ARCHITECT/ENGINEER TO PROVE NON-COMPLIANCE. THE SUBMITTING CONTRACTOR WILL BE CHARGED THE PREVAILING WAGE OF THE REVIEWING ENGINEER FOR ALL SUBMITTALS REQUIRING OVER ONE (1) HOUR TO REVIEW THAT WERE NOT ORIGINALLY SPECIFIED.**

**3.68 OPERATING INSTRUCTIONS**

**3.69 IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT THE OWNER'S REPRESENTATIVE IS GIVEN ADEQUATE INSTRUCTION ON THE OPERATION OF ALL EQUIPMENT PRIOR TO FINAL PAYMENT.**

**3.70 TEMPORARY POWER**

**3.71 THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY POWER TO ALL TRADES FOR ALL CONSTRUCTION LOCATIONS OF THIS CONTRACT. THIS WILL INCLUDE BUT NOT BE LIMITED TO TEMPORARY LIGHTING AND POWER OUTLETS.**

**PART 1 PRODUCTS**

**4.01 MATERIALS**

**4.02 ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND AS SPECIFIED OR OF EQUAL OR BETTER QUALITY.**

**4.03 BASIC HARDWARE AND MISCELLANEOUS ITEMS SHALL MEET EXISTING TRADE STANDARDS OF QUALITY AND SHALL CARRY UL OR FM LISTINGS WHERE APPLICABLE.**

**4.04 ALL EQUIPMENT SUPPLIED SHALL BE THE STANDARD EQUIPMENT OF THE MANUFACTURER.**

**4.05 MULTIPLE ITEMS SUCH AS PANELBOARDS, WIRING DEVICES, SWITCHES, BREAKERS, RACEWAYS, ETC., SHALL BE FROM THE SAME MANUFACTURER.**

**4.06 DRAWINGS AND SPECIFICATIONS ARE BASED ON SPECIFIC MANUFACTURER'S EQUIPMENT. THEREFORE, THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY, COST AND COORDINATION INVOLVED IN MAKING ANY NECESSARY REVISIONS TO APPLY ANOTHER MANUFACTURER'S EQUIPMENT, EVEN THOUGH IT MAY BE APPROVED AS AN "EQUAL" ITEM BY THE ENGINEER.**

**PART 1 EXECUTION**

**5.01 COORDINATION OF WORK**

**5.02 ALL WORK SHALL BE EXECUTED IN ACCORDANCE WITH RECOGNIZED STANDARDS OF WORKMANSHIP. ALL WORK SHALL BE INSTALLED IN A NEAT AND ORDERLY MANNER.**

**5.03 THE CONTRACTOR SHALL EXCHANGE INFORMATION WITH OTHER CONTRACTORS AND THE OWNER IN ORDER TO INSURE ORDERLY PROGRESS OF THE WORK.**

**5.04 THE CONTRACTOR MUST CONTACT THE OWNER'S REPRESENTATIVE AND SCHEDULE ALL WORK TEN (10) DAYS PRIOR TO START.**

**5.05 THE CONTRACTOR SHALL CHECK FOR POSSIBLE INTERFERENCE BEFORE INSTALLING ANY ITEMS. IF ANY WORK IS INSTALLED, AND LATER DEVELOPS INTERFERENCE WITH OTHER FEATURES OF THE DESIGN, THE CONTRACTOR WILL BE RESPONSIBLE TO MAKE SUCH CHANGES TO ELIMINATE THE INTERFERENCE.**

**5.06 CEILING REMOVAL**

**5.07 EXISTING CEILINGS WHICH MUST BE REMOVED FOR THE INSTALLATION OF NEW WORK OR DEMOLITION OF EXISTING CONDITIONS SHALL BE DONE BY THE CONTRACTOR. NO CEILING SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE OWNER. CEILINGS WHICH MUST BE REMOVED SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AS SOON AS PRACTICAL AND PRIOR TO FINAL PAYMENT.**

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- 5.08 THE REMOVED TILE OF LAY-IN TYPE CEILINGS SHALL BE STORED EITHER IN THE CEILING SPACE OR AT A DESIGNATED SPACE IN THE BUILDING. NO TILES SHALL BE STORED IN THE OCCUPIED SPACE.**
- 5.09 THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO THE EXISTING CEILINGS. ALL DAMAGED CEILINGS SHALL BE REPLACED WITH NEW CEILING CONSTRUCTION TO MATCH THE EXISTING AND TO THE OWNER'S SATISFACTION.**
- 5.10 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION**
- 5.11 COMPLY WITH NECA 1.**
- 5.12 MEASURE INDICATED MOUNTING HEIGHTS TO BOTTOM OF UNIT FOR SUSPENDED ITEMS AND TO CENTER OF UNIT FOR WALL-MOUNTING ITEMS.**
- 5.13 HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE MAXIMUM POSSIBLE HEADROOM CONSISTENT WITH THESE REQUIREMENTS.**
- 5.14 EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS OF BOTH ELECTRICAL EQUIPMENT AND OTHER NEARBY INSTALLATIONS. CONNECT IN SUCH A WAY AS TO FACILITATE FUTURE DISCONNECTING WITH MINIMUM INTERFERENCE WITH OTHER ITEMS IN THE VICINITY.**
- 5.15 RIGHT OF WAY: GIVE TO PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.**
- 5.16 FIRESTOPPING**
- 5.17 APPLY FIRESTOPPING TO PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES FOR ELECTRICAL INSTALLATIONS TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY. FIRESTOPPING MATERIALS AND INSTALLATION REQUIREMENTS ARE SPECIFIED IN DIVISION 7 SECTION "THROUGH-PENETRATION FIRESTOP SYSTEMS."**

**END OF SECTION**



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**SECTION 26 0505  
SELECTIVE DEMOLITION FOR ELECTRICAL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical demolition.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 7000 - Execution and Closeout Requirements: Additional requirements for alterations work.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

**PART 2 PRODUCTS**

**2.01 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work: As specified in individual sections.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify field measurements and circuiting arrangements are as indicated.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to Architect/Engineer before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

**3.02 PREPARATION**

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
  - 1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
  - 2. Make temporary connections to maintain service in areas adjacent to work area.

**3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
    - 1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
    - 2. PCB- and DEHP-containing lighting ballasts.
    - 3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
  - B. Remove, relocate, and extend existing installations to accommodate new construction.
  - C. Remove abandoned wiring to source of supply.
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- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- J. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

#### **3.04 CLEANING AND REPAIR**

- A. See Section 01 7419 - Construction Waste Management and Disposal for additional requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.
- C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

**END OF SECTION**



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**SECTION 26 0519**  
**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Single conductor building wire.
- B. Underground feeder and branch-circuit cable.
- C. Metal-clad cable.
- D. Wiring connectors.
- E. Electrical tape.
- F. Heat shrink tubing.
- G. Wire pulling lubricant.
- H. Cable ties.
- I. Firestop sleeves.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 26 0505 - Selective Demolition for Electrical: Disconnection, removal, and/or extension of existing electrical conductors and cables.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 28 4600 - Fire Detection and Alarm: Fire alarm system conductors and cables.

**1.03 REFERENCE STANDARDS**

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire 2013 (Reapproved 2018).
  - B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft 2011 (Reapproved 2017).
  - C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes 2010, with Editorial Revision (2020).
  - D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation 2004 (Reapproved 2020).
  - E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape 2017.
  - F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes 2020.
  - G. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
  - H. NECA 120 - Standard For Installing Armored Cable (Type AC) And Metal-Clad Cable (Type MC) 2018.
  - I. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF) 2007.
  - J. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy 2021.
  - K. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
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- L. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. UL 44 - Thermoset-Insulated Wires and Cables Current Edition, Including All Revisions.
- N. UL 83 - Thermoplastic-Insulated Wires and Cables Current Edition, Including All Revisions.
- O. UL 183 - Manufactured Wiring Systems Current Edition, Including All Revisions.
- P. UL 486A-486B - Wire Connectors Current Edition, Including All Revisions.
- Q. UL 486C - Splicing Wire Connectors Current Edition, Including All Revisions.
- R. UL 486D - Sealed Wire Connector Systems Current Edition, Including All Revisions.
- S. UL 493 - Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables Current Edition, Including All Revisions.
- T. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.
- U. UL 1569 - Metal-Clad Cables Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
  - 3. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
- C. Field Quality Control Test Reports.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- E. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.



**1.08 FIELD CONDITIONS**

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect/Engineer and obtain direction before proceeding with work.

**PART 2 PRODUCTS****2.01 CONDUCTOR AND CABLE APPLICATIONS**

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
  - 1. Exceptions:
    - a. Use manufactured wiring systems for branch circuits where concealed above accessible ceilings for lighting.
      - 1) Exception: Provide single conductor building wire in raceway for circuit homerun from distribution box to panelboard.
- C. Underground feeder and branch-circuit cable is permitted only as follows:
  - 1. Where not otherwise restricted, may be used:
    - a. For damp, wet, or corrosive locations as a substitute for NFPA 70, Type NMC nonmetallic-sheathed cable, when nonmetallic-sheathed cable is permitted.
- D. Service entrance cable is not permitted.
- E. Metal-clad cable is permitted only as follows:
  - 1. Where not otherwise restricted, may be used:
    - a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
    - b. Where concealed in hollow stud walls and above accessible ceilings for branch circuits up to 20 A.
  - 2. In addition to other applicable restrictions, may not be used:
    - a. Where exposed to view.
    - b. Where exposed to damage.
    - c. For damp, wet, or corrosive locations, unless provided with a PVC jacket listed as suitable for those locations.
    - d. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.

**2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS**

- A. Provide products that comply with requirements of NFPA 70.
  - B. Provide products listed, classified, and labeled as suitable for the purpose intended.
  - C. Provide new conductors and cables manufactured not more than one year prior to installation.
  - D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
  - E. Comply with NEMA WC 70.
  - F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
  - G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
  - H. Conductors for Grounding and Bonding: Also comply with Section 26 0526.
  - I. Conductor Material:
    - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
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- 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
  - 3. Tinned Copper Conductors: Comply with ASTM B33.
  - J. Minimum Conductor Size:
    - 1. Branch Circuits: 12 AWG.
      - a. Exceptions:
        - 1) 20 A, 120 V circuits longer than 100 feet: 10 AWG, for voltage drop.
        - 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
    - 2. Control Circuits: 14 AWG.
  - K. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
  - L. Conductor Color Coding:
    - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
    - 2. Color Coding Method: Integrally colored insulation.
    - 3. Color Code:
      - a. 480Y/277 V, 3 Phase, 4 Wire System:
        - 1) Phase A: Brown.
        - 2) Phase B: Orange.
        - 3) Phase C: Yellow.
        - 4) Neutral/Grounded: Gray.
      - b. 208Y/120 V, 3 Phase, 4 Wire System:
        - 1) Phase A: Black.
        - 2) Phase B: Red.
        - 3) Phase C: Blue.
        - 4) Neutral/Grounded: White.
      - c. 240/120 V High-Leg Delta, 3 Phase, 4 Wire System:
        - 1) Phase A: Black.
        - 2) Phase B (High-Leg): Orange.
        - 3) Phase C: Blue.
        - 4) Neutral/Grounded: White.
      - d. 240/120 V, 1 Phase, 3 Wire System:
        - 1) Phase A: Black.
        - 2) Phase B: Red.
        - 3) Neutral/Grounded: White.
      - e. Equipment Ground, All Systems: Green.
      - f. Isolated Ground, All Systems: Green with yellow stripe.
      - g. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
      - h. For control circuits, comply with manufacturer's recommended color code.

## 2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
  - 1. Copper Building Wire:
    - a. Cerro Wire LLC: [www.cerrowire.com/#sle](http://www.cerrowire.com/#sle).
    - b. Encore Wire Corporation: [www.encorewire.com/#sle](http://www.encorewire.com/#sle).
    - c. General Cable Technologies Corporation: [www.generalcable.com/#sle](http://www.generalcable.com/#sle).
    - d. Southwire Company: [www.southwire.com/#sle](http://www.southwire.com/#sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.



- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
  - 1. Feeders and Branch Circuits:
    - a. Size 10 AWG and Smaller: Solid.
    - b. Size 8 AWG and Larger: Stranded.
  - 2. Control Circuits: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
  - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2.

#### **2.04 UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE**

- A. Manufacturers:
  - 1. Cerro Wire LLC: [www.cerrowire.com/#sle](http://www.cerrowire.com/#sle).
  - 2. Service Wire Co: [www.servicewire.com/#sle](http://www.servicewire.com/#sle).
  - 3. Southwire Company: [www.southwire.com/#sle](http://www.southwire.com/#sle).
- B. Description: NFPA 70, Type UF multiple-conductor cable listed and labeled as complying with UL 493, Type UF-B.
- C. Provide equipment grounding conductor unless otherwise indicated.
- D. Conductor Stranding:
  - 1. Size 10 AWG and Smaller: Solid.
  - 2. Size 8 AWG and Larger: Stranded.
- E. Insulation Voltage Rating: 600 V.

#### **2.05 METAL-CLAD CABLE**

- A. Manufacturers:
  - 1. AFC Cable Systems Inc: [www.afcweb.com/#sle](http://www.afcweb.com/#sle).
  - 2. Encore Wire Corporation: [www.encorewire.com/#sle](http://www.encorewire.com/#sle).
  - 3. Service Wire Co: [www.servicewire.com/#sle](http://www.servicewire.com/#sle).
  - 4. Southwire Company: [www.southwire.com/#sle](http://www.southwire.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
- C. Conductor Stranding:
  - 1. Size 10 AWG and Smaller: Solid.
  - 2. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- F. Grounding: Full-size integral equipment grounding conductor.
- G. Armor: Steel, interlocked tape.
- H. Provide PVC jacket applied over cable armor where indicated or required for environment of installed location.

#### **2.06 WIRING CONNECTORS**

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 0526.
- C. Wiring Connectors for Splices and Taps:



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1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
  2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
  2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
  3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
  4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
  5. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
- E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
1. Manufacturers:
    - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
    - b. Ideal Industries, Inc: [www.idealindustries.com/#sle](http://www.idealindustries.com/#sle).
    - c. NSI Industries LLC: [www.nsiindustries.com/#sle](http://www.nsiindustries.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- H. Mechanical Connectors: Provide bolted type or set-screw type.
1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
    - b. IlSCO: [www.ilsco.com/#sle](http://www.ilsco.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
    - b. IlSCO: [www.ilsco.com/#sle](http://www.ilsco.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
    - b. IlSCO: [www.ilsco.com/#sle](http://www.ilsco.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.

## 2.07 ACCESSORIES

- A. Electrical Tape:
1. Manufacturers:
    - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
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- b. Plymouth Rubber Europa: [www.plymouthrubber.com/#sle](http://www.plymouthrubber.com/#sle).
      - c. Substitutions: See Section 01 6000 - Product Requirements.
    - 2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
    - 3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
    - 4. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
  - B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
    - 1. Manufacturers:
      - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
      - b. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
      - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  - C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
    - 1. Manufacturers:
      - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
      - b. American Polywater Corporation: [www.polywater.com/#sle](http://www.polywater.com/#sle).
      - c. Ideal Industries, Inc: [www.idealindustries.com/#sle](http://www.idealindustries.com/#sle).
      - d. Substitutions: See Section 01 6000 - Product Requirements.
  - D. Cable Ties: Material and tensile strength rating suitable for application.
    - 1. Manufacturers:
      - a. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
  - E. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for cables and roofing system to be installed; designed to accommodate existing penetrations where applicable.
    - 1. Products:
      - a. Menzies Metal Products; Electrical Roof Stack and Cap: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
      - b. Menzies Metal Products; Electrical Retro Box: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
      - c. Substitutions: See Section 01 6000 - Product Requirements.
  - F. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.
    - 1. Products:
      - a. HoldRite, a brand of Reliance Worldwide Corporation; HydroFlame Pro Series/HydroFlame Custom Built: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
      - b. Substitutions: See Section 01 6000 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that interior of building has been protected from weather.
  - B. Verify that work likely to damage wire and cable has been completed.
  - C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
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- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

### 3.03 INSTALLATION

- A. Circuiting Requirements:
  - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
  - 2. When circuit destination is indicated without specific routing, determine exact routing required.
  - 3. Arrange circuiting to minimize splices.
  - 4. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
  - 5. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.
- E. Install metal-clad cable (Type MC) in accordance with NECA 120.
- F. Installation in Raceway:
  - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
  - 2. Pull all conductors and cables together into raceway at same time.
  - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
  - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- G. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- H. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
  - 1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
- I. Terminate cables using suitable fittings.
  - 1. Metal-Clad Cable (Type MC):
    - a. Use listed fittings.
    - b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- J. Install conductors with a minimum of 12 inches of slack at each outlet.
- K. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.
- L. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- M. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.



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- N. Make wiring connections using specified wiring connectors.
    - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
    - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
    - 3. Do not remove conductor strands to facilitate insertion into connector.
    - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
    - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
    - 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
  - O. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
  - P. Insulate ends of spare conductors using vinyl insulating electrical tape.
  - Q. Identify conductors and cables in accordance with Section 26 0553.
  - R. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
  - S. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

#### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
- D. Correct deficiencies and replace damaged or defective conductors and cables.

**END OF SECTION**



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**SECTION 26 0526**  
**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.
- D. Ground bars.
- E. Ground rod electrodes.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NEMA GR 1 - Ground Rod Electrodes and Ground Rod Electrode Couplings 2017.
- C. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
- D. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 467 - Grounding and Bonding Equipment Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Verify exact locations of underground metal water service pipe entrances to building.
  - 2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
  - 3. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not install ground rod electrodes until final backfill and compaction is complete.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.
- C. Field quality control test reports.

**1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
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**PART 2 PRODUCTS****2.01 GROUNDING AND BONDING REQUIREMENTS**

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- E. Bonding and Equipment Grounding:
  - 1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
  - 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
  - 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
  - 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
  - 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
  - 6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

**2.02 GROUNDING AND BONDING COMPONENTS**

- A. General Requirements:
    - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
    - 2. Provide products listed and labeled as complying with UL 467 where applicable.
  - B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
    - 1. Use insulated copper conductors unless otherwise indicated.
      - a. Exceptions:
        - 1) Use bare copper conductors where installed underground in direct contact with earth.
        - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
  - C. Connectors for Grounding and Bonding:
    - 1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
    - 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
    - 3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
    - 4. Manufacturers - Mechanical and Compression Connectors:
      - a. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
      - b. Harger Lightning & Grounding: [www.harger.com/#sle](http://www.harger.com/#sle).
      - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
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5. Manufacturers - Exothermic Welded Connections:
    - a. Burndy LLC: [www.burndy.com/#sle](http://www.burndy.com/#sle).
    - b. Cadweld, a brand of Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
    - c. thermOweld, subsidiary of Continental Industries; division of Burndy LLC: [www.thermoweld.com/#sle](http://www.thermoweld.com/#sle).
  - D. Ground Bars:
    1. Description: Copper rectangular ground bars with mounting brackets and insulators.
    2. Size: As indicated.
    3. Holes for Connections: As indicated or as required for connections to be made.
    4. Manufacturers:
      - a. Advanced Lightning Technology (ALT): [www.altfab.com/#sle](http://www.altfab.com/#sle).
      - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
      - c. Harger Lightning & Grounding: [www.harger.com/#sle](http://www.harger.com/#sle).
  - E. Ground Rod Electrodes:
    1. Comply with NEMA GR 1.
    2. Material: Copper-bonded (copper-clad) steel.
    3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.
    4. Manufacturers:
      - a. Advanced Lightning Technology (ALT): [www.altfab.com/#sle](http://www.altfab.com/#sle).
      - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
      - c. Galvan Industries, Inc: [www.galvanelectrical.com/#sle](http://www.galvanelectrical.com/#sle).
      - d. Harger Lightning & Grounding: [www.harger.com/#sle](http://www.harger.com/#sle).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
  - B. Perform work in accordance with NECA 1 (general workmanship).
  - C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.
    1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches below finished grade.
  - D. Make grounding and bonding connections using specified connectors.
    1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
    2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
    3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
    4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
    5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
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- E. Identify grounding and bonding system components in accordance with Section 26 0553.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.13.
- D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

**END OF SECTION**



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**SECTION 26 0529**  
**HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- C. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
- D. Section 26 5100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.
- D. MFMA-4 - Metal Framing Standards Publication 2004.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
  - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
  - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
  - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
  - 5. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.
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**1.06 QUALITY ASSURANCE**

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

**PART 2 PRODUCTS****2.01 SUPPORT AND ATTACHMENT COMPONENTS**

- A. General Requirements:
    - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
    - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
    - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
    - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
    - 5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
    - 6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
  - B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
    - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
    - 2. Conduit Clamps: Bolted type unless otherwise indicated.
    - 3. Manufacturers:
      - a. Cooper Crouse-Hinds, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
      - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
      - c. HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
      - d. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
      - e. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  - C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
    - 1. Manufacturers:
      - a. Cooper Crouse-Hinds, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
      - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
      - c. HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
      - d. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
      - e. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  - D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
    - 1. Comply with MFMA-4.
  - E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
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- F. Non-Penetrating Rooftop Supports for Low-Slope Roofs: Steel pedestals with thermoplastic or rubber bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified.
1. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
  2. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
  3. Mounting Height: Provide minimum clearance of 6 inches under supported component to top of roofing.
  4. Manufacturers:
    - a. Cooper B-Line, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
    - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
    - c. Unistrut, a brand of Atkore International Inc: [www.unistrut.com/#sle](http://www.unistrut.com/#sle).
- G. Anchors and Fasteners:
1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
  - B. Perform work in accordance with NECA 1 (general workmanship).
  - C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
  - D. Unless specifically indicated or approved by Architect/Engineer, do not provide support from suspended ceiling support system or ceiling grid.
  - E. Unless specifically indicated or approved by Architect/Engineer, do not provide support from roof deck.
  - F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
  - G. Equipment Support and Attachment:
    1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
    2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
    3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
    4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
  - H. Conduit Support and Attachment: Also comply with Section 26 0533.13.
  - I. Box Support and Attachment: Also comply with Section 26 0533.16.
  - J. Interior Luminaire Support and Attachment: Also comply with Section 26 5100.
  - K. Secure fasteners according to manufacturer's recommended torque settings.
  - L. Remove temporary supports.
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- M. Identify independent electrical component support wires above accessible ceilings (only where specifically indicated or permitted) with color distinguishable from ceiling support wires in accordance with NFPA 70.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

**END OF SECTION**



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**SECTION 26 0533.13  
CONDUIT FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Galvanized steel rigid metal conduit (RMC).
- B. Aluminum rigid metal conduit (RMC).
- C. Intermediate metal conduit (IMC).
- D. Flexible metal conduit (FMC).
- E. Liquidtight flexible metal conduit (LFMC).
- F. Electrical metallic tubing (EMT).
- G. Rigid polyvinyl chloride (PVC) conduit.
- H. Electrical nonmetallic tubing (ENT).
- I. Conduit fittings.
- J. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Metal clad cable (Type MC), armored cable (Type AC), and manufactured wiring systems, including uses permitted.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0529 - Hangers and Supports for Electrical Systems.
- E. Section 26 0533.16 - Boxes for Electrical Systems.
- F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- G. Section 31 2316 - Excavation.
- H. Section 31 2323 - Fill: Bedding and backfilling.

**1.03 REFERENCE STANDARDS**

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC) 2020.
  - B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S) 2020.
  - C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit 2018.
  - D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
  - E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT) 2013.
  - F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC) 2017.
  - G. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
  - H. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit 2020.
  - I. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing 2021.
  - J. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
  - K. UL 1 - Flexible Metal Conduit Current Edition, Including All Revisions.
  - L. UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.
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- M. UL 360 - Liquid-Tight Flexible Metal Conduit Current Edition, Including All Revisions.
- N. UL 514B - Conduit, Tubing, and Cable Fittings Current Edition, Including All Revisions.
- O. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings Current Edition, Including All Revisions.
- P. UL 797 - Electrical Metallic Tubing-Steel Current Edition, Including All Revisions.
- Q. UL 1242 - Electrical Intermediate Metal Conduit-Steel Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
  - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
  - 4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
  - 5. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

### **PART 2 PRODUCTS**

#### **2.01 CONDUIT APPLICATIONS**

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Underground:
  - 1. Under Slab on Grade: Use rigid PVC conduit.
  - 2. Exterior, Direct-Buried: Use rigid PVC conduit.
  - 3. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
- D. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
- E. Concealed Within Hollow Stud Walls: Use intermediate metal conduit (IMC) or electrical metallic tubing (EMT).



- F. Concealed Above Accessible Ceilings: Use intermediate metal conduit (IMC) or electrical metallic tubing (EMT).
- G. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.
- H. Exposed, Interior, Not Subject to Physical Damage: Use electrical metallic tubing (EMT).
- I. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
- J. Exposed, Exterior: Use galvanized steel rigid metal conduit.
- K. Connections to Vibrating Equipment:
  - 1. Dry Locations: Use flexible metal conduit.
  - 2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
  - 3. Maximum Length: 6 feet unless otherwise indicated.

## **2.02 CONDUIT REQUIREMENTS**

- A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
- B. Fittings for Grounding and Bonding: Also comply with Section 26 0526.
- C. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- D. Provide products listed, classified, and labeled as suitable for the purpose intended.
- E. Minimum Conduit Size, Unless Otherwise Indicated:
  - 1. Branch Circuits: 3/4 inch (21 mm) trade size.
  - 2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
  - 3. Underground, Exterior: 1 inch (27 mm) trade size.
- F. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

## **2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)**

- A. Manufacturers:
  - 1. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.com/#sle](http://www.alliedeg.com/#sle).
  - 2. Nucor Tubular Products: [www.nucortubular.com/#sle](http://www.nucortubular.com/#sle).
  - 3. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  - 4. Wheatland Tube, a division of Zekelman Industries: [www.wheatland.com/#sle](http://www.wheatland.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- C. Fittings:
  - 1. Manufacturers:
    - a. Bridgeport Fittings Inc: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - b. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 3. Material: Use steel or malleable iron.
  - 4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

## **2.04 INTERMEDIATE METAL CONDUIT (IMC)**

- A. Manufacturers:
  - 1. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.com/#sle](http://www.alliedeg.com/#sle).



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2. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  3. Wheatland Tube, a division of Zekelman Industries: [www.wheatland.com/#sle](http://www.wheatland.com/#sle).
  - B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.
  - C. Fittings:
    1. Manufacturers:
      - a. Bridgeport Fittings Inc: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
      - b. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
      - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
    3. Material: Use steel or malleable iron.
    4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

## **2.05 FLEXIBLE METAL CONDUIT (FMC)**

- A. Manufacturers:
  1. AFC Cable Systems, Inc: [www.afcweb.com/#sle](http://www.afcweb.com/#sle).
  2. Electri-Flex Company: [www.electriflex.com/#sle](http://www.electriflex.com/#sle).
  3. International Metal Hose: [www.metalhose.com/#sle](http://www.metalhose.com/#sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
- C. Fittings:
  1. Manufacturers:
    - a. Bridgeport Fittings Inc: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - b. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
  2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  3. Material: Use steel.

## **2.06 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)**

- A. Manufacturers:
  1. AFC Cable Systems, Inc: [www.afcweb.com/#sle](http://www.afcweb.com/#sle).
  2. Electri-Flex Company: [www.electriflex.com/#sle](http://www.electriflex.com/#sle).
  3. International Metal Hose: [www.metalhose.com/#sle](http://www.metalhose.com/#sle).
- B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- C. Fittings:
  1. Manufacturers:
    - a. Bridgeport Fittings Inc: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - b. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  3. Material: Use steel or malleable iron.

## **2.07 ELECTRICAL METALLIC TUBING (EMT)**

- A. Manufacturers:
  1. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.com/#sle](http://www.alliedeg.com/#sle).



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2. Nucor Tubular Products: [www.nucortubular/#sle](http://www.nucortubular/#sle).
  3. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  4. Wheatland Tube, a division of Zekelman Industries: [www.wheatland.com/#sle](http://www.wheatland.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- C. Fittings:
1. Manufacturers:
    - a. Bridgeport Fittings Inc: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - b. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  3. Material: Use steel.
  4. Connectors and Couplings: Use compression (gland) type.
    - a. Do not use indenter type connectors and couplings.
    - b. Do not use set-screw type connectors and couplings.

## **2.08 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT**

- A. Manufacturers:
1. Cantex Inc: [www.cantexinc.com/#sle](http://www.cantexinc.com/#sle).
  2. Carlon, a brand of Thomas & Betts Corporation: [www.carlon.com/#sle](http://www.carlon.com/#sle).
  3. JM Eagle: [www.jmeagle.com/#sle](http://www.jmeagle.com/#sle).
- B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- C. Fittings:
1. Manufacturer: Same as manufacturer of conduit to be connected.
  2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

## **2.09 ACCESSORIES**

- A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil.
- B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
- C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
- D. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.
- E. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
- F. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.
- G. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.
1. Products:
    - a. Menzies Metal Products; Electrical Roof Stack and Cap: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
    - b. Menzies Metal Products; Electrical Retro Box: [www.menzies-metal.com/#sle](http://www.menzies-metal.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
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- H. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.
  - 1. Products:
    - a. HoldRite, a brand of Reliance Worldwide Corporation; HydroFlame Pro Series/HydroFlame Custom Built: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Install intermediate metal conduit (IMC) in accordance with NECA 101.
- E. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.
- F. Conduit Routing:
  - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
  - 2. When conduit destination is indicated without specific routing, determine exact routing required.
  - 3. Conceal all conduits unless specifically indicated to be exposed.
  - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
    - a. Electrical rooms.
    - b. Mechanical equipment rooms.
    - c. Within joists in areas with no ceiling.
  - 5. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
  - 6. Arrange conduit to maintain adequate headroom, clearances, and access.
  - 7. Arrange conduit to provide no more than 150 feet between pull points.
  - 8. Route conduits above water and drain piping where possible.
  - 9. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
- G. Conduit Support:
  - 1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
  - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
  - 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
  - 4. Use conduit strap to support single surface-mounted conduit.
    - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
  - 5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
  - 6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
  - 7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.



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8. Use non-penetrating rooftop supports to support conduits routed across rooftops (only where approved).
- H. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
  2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
  3. Use suitable adapters where required to transition from one type of conduit to another.
  4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
  5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
  6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
  7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
- I. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
  2. Make penetrations perpendicular to surfaces unless otherwise indicated.
  3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
  4. Conceal bends for conduit risers emerging above ground.
  5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
  6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
  7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
  8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- J. Underground Installation:
1. Provide trenching and backfilling in accordance with Section 31 2316 and Section 31 2323.
- K. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
  2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
  3. Where conduits are subject to earth movement by settlement or frost.
- L. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
  2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- M. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.
-



- N. Provide grounding and bonding in accordance with Section 26 0526.
- O. Identify conduits in accordance with Section 26 0553.

### **3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective conduits.

### **3.04 CLEANING**

- A. Clean interior of conduits to remove moisture and foreign matter.

### **3.05 PROTECTION**

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

**END OF SECTION**



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**SECTION 26 0533.16**  
**BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.
- C. Underground boxes/enclosures.
- D. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 3100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- C. Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Section 26 0533.13 - Conduit for Electrical Systems:
  - 1. Conduit bodies and other fittings.
  - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 2726 - Wiring Devices:
  - 1. Wall plates.
  - 2. Additional requirements for locating boxes for wiring devices.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports 2013 (Reaffirmed 2020).
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. SCTE 77 - Specifications for Underground Enclosure Integrity 2017.
- H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations Current Edition, Including All Revisions.
- I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations Current Edition, Including All Revisions.
- J. UL 508A - Industrial Control Panels Current Edition, Including All Revisions.
- K. UL 514A - Metallic Outlet Boxes Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
    - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
-



2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

### **PART 2 PRODUCTS**

#### **2.01 BOXES**

- A. General Requirements:
  1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
  2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
  3. Provide products listed, classified, and labeled as suitable for the purpose intended.
  4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
  5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
  1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
  2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
  3. Use suitable concrete type boxes where flush-mounted in concrete.
  4. Use suitable masonry type boxes where flush-mounted in masonry walls.
  5. Use raised covers suitable for the type of wall construction and device configuration where required.
  6. Use shallow boxes where required by the type of wall construction.
  7. Do not use "through-wall" boxes designed for access from both sides of wall.
  8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
  9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.



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10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
  11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
  12. Minimum Box Size, Unless Otherwise Indicated:
    - a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
  13. Wall Plates: Comply with Section 26 2726.
  14. Manufacturers:
    - a. Cooper Crouse-Hinds, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
    - b. Hubbell Incorporated; Bell Products: [www.hubbell-rtb.com/#sle](http://www.hubbell-rtb.com/#sle).
    - c. Hubbell Incorporated; RACO Products: [www.hubbell-rtb.com/#sle](http://www.hubbell-rtb.com/#sle).
    - d. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - e. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  - C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
    1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
    2. NEMA 250 Environment Type, Unless Otherwise Indicated:
      - a. Indoor Clean, Dry Locations: Type 1, painted steel.
      - b. Outdoor Locations: Type 3R, painted steel.
    3. Junction and Pull Boxes Larger Than 100 cubic inches:
      - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
  - D. Underground Boxes/Enclosures:
    1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
    2. Size: As indicated on drawings.
    3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
    4. Provide logo on cover to indicate type of service.
    5. Applications:
      - a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 8 load rating.
      - b. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 15 load rating.
      - c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
    6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
      - a. Manufacturers:
        - 1) Hubbell Incorporated; Quazite Products: [www.hubbellpowersystems.com/#sle](http://www.hubbellpowersystems.com/#sle).
        - 2) MacLean Highline: [www.macleanhigline.com/#sle](http://www.macleanhigline.com/#sle).
        - 3) Oldcastle Precast, Inc: [www.oldcastleprecast.com/#sle](http://www.oldcastleprecast.com/#sle).
      - b. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.
      - c. Product(s):
        - 1) MacLean Highline CHA Series: Fiberglass/polymer concrete splice box/pull box; available Tier 8 and Tier 15 load ratings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
-



- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- E. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- F. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- G. Box Locations:
  - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 3100 as required where approved by the Architect.
  - 2. Locate boxes as required for devices installed under other sections or by others.
    - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.
  - 3. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
  - 4. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
    - a. Concealed above accessible suspended ceilings.
    - b. Within joists in areas with no ceiling.
    - c. Electrical rooms.
    - d. Mechanical equipment rooms.
- H. Box Supports:
  - 1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
  - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
  - 3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
- I. Install boxes plumb and level.
- J. Flush-Mounted Boxes:
  - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
  - 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
  - 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.
- K. Install boxes as required to preserve insulation integrity.
- L. Underground Boxes/Enclosures:
  - 1. Install enclosure on gravel base, minimum 6 inches deep.



- 2. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.
- 3. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.
- M. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- N. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- O. Close unused box openings.
- P. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- Q. Provide grounding and bonding in accordance with Section 26 0526.
- R. Identify boxes in accordance with Section 26 0553.

### **3.03 CLEANING**

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

### **3.04 PROTECTION**

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

**END OF SECTION**



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**SECTION 26 0553  
IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.
- D. Voltage markers.
- E. Underground warning tape.
- F. Warning signs and labels.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 9113 - Exterior Painting.
- B. Section 09 9123 - Interior Painting.
- C. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
- D. Section 26 2726 - Wiring Devices - Lutron: Device and wallplate finishes; factory pre-marked wallplates.

**1.03 REFERENCE STANDARDS**

- A. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. UL 969 - Marking and Labeling Systems Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

**1.05 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

**1.06 FIELD CONDITIONS**

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION REQUIREMENTS**

- A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.
  - B. Identification for Equipment:
    - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
    - 2. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
    - 3. Use identification label or handwritten text using indelible marker on inside of door at each fused switch to identify required NEMA fuse class and size.
    - 4. Use identification label or handwritten text using indelible marker on inside of door at each motor controller to identify nameplate horsepower, full load amperes, code letter, service factor, voltage, and phase of motor(s) controlled.
-



- C. Identification for Conductors and Cables:
  - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
  - 2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
  - 3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
    - a. At each source and load connection.
    - b. Within boxes when more than one circuit is present.
    - c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
  - 4. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
  - 5. Use underground warning tape to identify direct buried cables.
- D. Identification for Raceways:
  - 1. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify circuits enclosed for accessible conduits at wall penetrations, at floor penetrations, at roof penetrations, and at equipment terminations when source is not within sight.
  - 2. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.
  - 3. Use underground warning tape to identify underground raceways.
- E. Identification for Boxes:
  - 1. Use voltage markers or color coded boxes to identify systems other than normal power system.
    - a. Color-Coded Boxes: Field-painted in accordance with Section 09 9123 and 09 9113 per the same color code used for raceways.
      - 1) Fire Alarm System: Red.
  - 2. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
- F. Identification for Devices:
  - 1. Wiring Device and Wallplate Finishes: Comply with Section 26 2726.
  - 2. Use identification label to identify fire alarm system devices.
  - 3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
- G. Identification for Luminaires:
  - 1. Use permanent red dot on luminaire frame to identify luminaires connected to emergency power system.

## **2.02 IDENTIFICATION NAMEPLATES AND LABELS**

- A. Identification Nameplates:
    - 1. Manufacturers:
      - a. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
      - b. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com/#sle](http://www.kolbipipemarkers.com/#sle).
      - c. Seton Identification Products: [www.seton.com/#sle](http://www.seton.com/#sle).
    - 2. Materials:
      - a. Indoor Clean, Dry Locations: Use plastic nameplates.
      - b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
    - 3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
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4. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
  5. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
  6. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.
- B. Identification Labels:
1. Manufacturers:
    - a. Brady Corporation: [www.bradyid.com/#sle](http://www.bradyid.com/#sle).
    - b. Brother International Corporation: [www.brother-usa.com/#sle](http://www.brother-usa.com/#sle).
    - c. Panduit Corp: [www.panduit.com/#sle](http://www.panduit.com/#sle).
  2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
  3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- C. Format for Receptacle Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
  2. Legend: Power source and circuit number or other designation indicated.
  3. Text: All capitalized unless otherwise indicated.
  4. Minimum Text Height: 3/16 inch.
  5. Color: Black text on clear background.
- D. Format for Fire Alarm Device Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
  2. Legend: Designation indicated and device zone or address.
  3. Text: All capitalized unless otherwise indicated.
  4. Minimum Text Height: 3/16 inch.
  5. Color: Red text on white background.

## **2.03 WIRE AND CABLE MARKERS**

- A. Manufacturers:
1. Brady Corporation: [www.bradyid.com/#sle](http://www.bradyid.com/#sle).
  2. HellermannTyton: [www.hellermannntyton.com/#sle](http://www.hellermannntyton.com/#sle).
  3. Panduit Corp: [www.panduit.com/#sle](http://www.panduit.com/#sle).
- B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
- C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- D. Legend: Power source and circuit number or other designation indicated.
- E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
1. Do not use handwritten text.
- F. Minimum Text Height: 1/8 inch.
- G. Color: Black text on white background unless otherwise indicated.

## **2.04 VOLTAGE MARKERS**

- A. Manufacturers:
1. Brady Corporation: [www.bradyid.com/#sle](http://www.bradyid.com/#sle).
  2. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
  3. Seton Identification Products: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.
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- C. Minimum Size:
  - 1. Markers for Equipment: 1 1/8 by 4 1/2 inches.
  - 2. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
  - 3. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.
  - 4. Markers for Junction Boxes: 1/2 by 2 1/4 inches.
- D. Legend:
  - 1. Markers for System Identification:
- E. Color: Black text on orange background unless otherwise indicated.

## **2.05 UNDERGROUND WARNING TAPE**

- A. Manufacturers:
  - 1. Brady Corporation; [\_\_\_\_]: [www.bradyid.com/#sle](http://www.bradyid.com/#sle).
  - 2. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
  - 3. Seton Identification Products; [\_\_\_\_]: [www.seton.com/#sle](http://www.seton.com/#sle).
- B. Materials: Use foil-backed detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
- C. Foil-backed Detectable Type Tape: 3 inches wide, with minimum thickness of 5 mil, unless otherwise required for proper detection.
- D. Legend: Type of service, continuously repeated over full length of tape.
- E. Color:
  - 1. Tape for Buried Power Lines: Black text on red background.

## **2.06 WARNING SIGNS AND LABELS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
  - 2. Clarion Safety Systems, LLC: [www.clarionsafety.com/#sle](http://www.clarionsafety.com/#sle).
  - 3. Insite Solutions, LLC: [www.stop-painting.com/#sle](http://www.stop-painting.com/#sle).
- B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- C. Warning Signs:
  - 1. Materials:
    - a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
    - b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
  - 2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
  - 3. Minimum Size: 7 by 10 inches unless otherwise indicated.
- D. Warning Labels:
  - 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
  - 2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
  - 3. Minimum Size: 2 by 4 inches unless otherwise indicated.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
  - B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
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1. Surface-Mounted Equipment: Enclosure front.
  2. Flush-Mounted Equipment: Inside of equipment door.
  3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
  4. Elevated Equipment: Legible from the floor or working platform.
  5. Interior Components: Legible from the point of access.
  6. Conduits: Legible from the floor.
  7. Boxes: Outside face of cover.
  8. Conductors and Cables: Legible from the point of access.
  9. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.
- G. Secure rigid signs using stainless steel screws.
- H. Mark all handwritten text, where permitted, to be neat and legible.

### **3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

**END OF SECTION**



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**SECTION 26 0923  
LIGHTING CONTROL DEVICES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Occupancy sensors.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems
- C. Section 26 0533.16 - Boxes for Electrical Systems.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 2726 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, and fan speed controllers.
  - 1. Includes finish requirements for wall controls specified in this section.
  - 2. Includes accessory receptacles, switches, dimmers and wall plates, to match lighting controls specified in this section.
- F. Section 26 5100 - Interior Lighting.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
  - 2. Coordinate the placement of wall switch occupancy sensors with actual installed door swings.
  - 3. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
  - 4. Notify Architect/Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.
- B. Sequencing:
  - 1. Do not install lighting control devices until final surface finishes and painting are complete.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
  - C. Shop Drawings:
    - 1. Occupancy Sensors: Provide lighting plan indicating location, model number, and orientation of each occupancy sensor and associated system component.
  - D. Field Quality Control Reports.
  - E. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
-



- F. Operation and Maintenance Data: Include detailed information on device programming and setup.
- G. Project Record Documents: Record actual installed locations and settings for lighting control devices.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

#### **1.07 DELIVERY, STORAGE, AND PROTECTION**

- A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

#### **1.08 FIELD CONDITIONS**

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

### **PART 2 PRODUCTS**

#### **2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS**

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

#### **2.02 OCCUPANCY SENSORS**

- A. Manufacturers:
  - 1. Hubbell Incorporated: [www.hubbell.com/#sle](http://www.hubbell.com/#sle).
  - 2. Lutron Electronics Company, Inc: [www.lutron.com/#sle](http://www.lutron.com/#sle).
  - 3. Sensor Switch Inc: [www.sensorswitch.com/#sle](http://www.sensorswitch.com/#sle).
  - 4. WattStopper: [www.wattstopper.com/#sle](http://www.wattstopper.com/#sle).
- B. All Occupancy Sensors:
  - 1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
  - 2. Sensor Technology:
    - a. Passive Infrared/Acoustic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and audible sound sensing technologies.
  - 3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
  - 4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
  - 5. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
  - 6. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
  - 7. Adaptive Technology: Field selectable; capable of self-adjusting sensitivity and time delay according to conditions.
  - 8. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.
  - 9. Load Rating for Line Voltage Occupancy Sensors: As required to control the load indicated on drawings.



- C. Wall Switch Occupancy Sensors:
  - 1. All Wall Switch Occupancy Sensors:
    - a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.
    - b. Unless otherwise indicated or required to control the load indicated on drawings, provide line voltage units with self-contained relay.
    - c. Operation: Field selectable to operate either as occupancy sensor (automatic on/off) or as vacancy sensor (manual-on/automatic off).
    - d. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.
    - e. Finish: White.
  - 2. Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 square feet.
- D. Ceiling Mounted Occupancy Sensors:
  - 1. All Ceiling Mounted Occupancy Sensors:
    - a. Description: Low profile occupancy sensors designed for ceiling installation.
    - b. Unless otherwise indicated or required to control the load indicated on drawings, provide low voltage units, for use with separate compatible accessory power packs.
    - c. Occupancy sensor to be field selectable as either manual-on/automatic-off or automatic on/off.
    - d. Finish: White unless otherwise indicated.
  - 2. Passive Infrared/Acoustic Dual Technology Ceiling Mounted Occupancy Sensors:
    - a. Standard Range Sensors: Capable of detecting motion within an area of 900 square feet at a mounting height of 9 feet, with a field of view of 360 degrees.
- E. Power Packs for Low Voltage Occupancy Sensors:
  - 1. Description: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensors for switching of line voltage loads.
  - 2. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on drawings.
  - 3. Input Supply Voltage: Dual rated for 120/277 V ac.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
- F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.
- G. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.



### 3.03 INSTALLATION

- A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of lighting control devices provided under this section.
- C. Install lighting control devices in accordance with manufacturer's instructions.
- D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- E. Install lighting control devices plumb and level, and held securely in place.
- F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 2726.
- G. Provide required supports in accordance with Section 26 0529.
- H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- I. Occupancy Sensor Locations:
  - 1. Location Adjustments: Within the design intent, reasonably minor adjustments to locations may be made in order to optimize coverage and avoid conflicts or problems affecting coverage.
  - 2. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.
- J. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.
- K. Unless otherwise indicated, install switches on load side of power packs so that switch does not turn off power pack.

### 3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect each lighting control device for damage and defects.
- C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area. Record test results in written report to be included with submittals.
- D. Correct wiring deficiencies and replace damaged or defective lighting control devices.

### 3.05 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.
- B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect/Engineer.
- C. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.
- D. Adjust time switch settings to achieve desired operation schedule as indicated or as directed by Architect/Engineer. Record settings in written report to be included with submittals.

### 3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.
-



**3.07 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

**END OF SECTION**



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**SECTION 26 2726  
WIRING DEVICES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wall switches.
- B. Receptacles.
- C. Wall plates.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- C. Section 26 0533.16 - Boxes for Electrical Systems.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 0923 - Lighting Control Devices: Devices for automatic control of lighting, including occupancy sensors, in-wall time switches, and in-wall interval timers.

**1.03 REFERENCE STANDARDS**

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for 2014h, with Amendments (2017).
- B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification) 2014g, with Amendment (2017).
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- E. NEMA WD 1 - General Color Requirements for Wiring Devices 1999 (Reaffirmed 2020).
- F. NEMA WD 6 - Wiring Devices - Dimensional Specifications 2016.
- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 20 - General-Use Snap Switches Current Edition, Including All Revisions.
- I. UL 498 - Attachment Plugs and Receptacles Current Edition, Including All Revisions.
- J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices Current Edition, Including All Revisions.
- K. UL 943 - Ground-Fault Circuit-Interrupters Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
    - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
    - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
    - 3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
    - 4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
    - 5. Notify Architect/Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.
  - B. Sequencing:
-



1. Do not install wiring devices until final surface finishes and painting are complete.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Keys for Locking Switches: Two of each type.
  3. Extra Wall Plates: One of each style, size, and finish.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Products: Listed, classified, and labeled as suitable for the purpose intended.

#### **1.07 DELIVERY, STORAGE, AND PROTECTION**

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

### **PART 2 PRODUCTS**

#### **2.01 WIRING DEVICE APPLICATIONS**

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Unless noted otherwise, do not use combination switch/receptacle devices.

#### **2.02 WIRING DEVICE FINISHES**

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices, Unless Otherwise Indicated: White with stainless steel wall plate.

#### **2.03 WALL SWITCHES**

- A. Manufacturers:
  1. Hubbell Incorporated: [www.hubbell.com/#sle](http://www.hubbell.com/#sle).
  2. Leviton Manufacturing Company, Inc: [www.leviton.com/#sle](http://www.leviton.com/#sle).
  3. Pass & Seymour, a brand of Legrand North America, Inc: [www.legrand.us/#sle](http://www.legrand.us/#sle).
- B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
  1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- C. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.
- D. Locking Wall Switches: Industrial specification grade, 20 A, 120/277 V with lever type keyed switch actuator and maintained contacts; switches keyed alike; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

#### **2.04 RECEPTACLES**

- A. Manufacturers:
  1. Hubbell Incorporated: [www.hubbell.com/#sle](http://www.hubbell.com/#sle).
  2. Leviton Manufacturing Company, Inc: [www.leviton.com/#sle](http://www.leviton.com/#sle).
  3. Lutron Electronics Company, Inc; Designer Style: [www.lutron.com/#sle](http://www.lutron.com/#sle).



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4. Pass & Seymour, a brand of Legrand North America, Inc: [www.legrand.us/#sle](http://www.legrand.us/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
  2. NEMA configurations specified are according to NEMA WD 6.
- C. Convenience Receptacles:
1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
- D. GFCI Receptacles:
1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
    - a. Provide test and reset buttons of same color as device.
  2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
  3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.
    - a. Products:

## **2.05 WALL PLATES**

- A. Manufacturers:
1. Hubbell Incorporated: [www.hubbell-wiring.com/#sle](http://www.hubbell-wiring.com/#sle).
  2. Leviton Manufacturing Company, Inc: [www.leviton.com/#sle](http://www.leviton.com/#sle).
  3. Lutron Electronics Company, Inc: [www.lutron.com/#sle](http://www.lutron.com/#sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Wall Plates: Comply with UL 514D.
1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
  2. Size: Standard.
  3. Screws: Metal with slotted heads finished to match wall plate finish.
- C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.
- D. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.
-



### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

### **3.03 INSTALLATION**

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
  - 1. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect/Engineer to obtain direction prior to proceeding with work.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- N. Identify wiring devices in accordance with Section 26 0553.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect each wiring device for damage and defects.
- C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.
- D. Test each receptacle to verify operation and proper polarity.
- E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- F. Correct wiring deficiencies and replace damaged or defective wiring devices.

### **3.05 ADJUSTING**

- A. Adjust devices and wall plates to be flush and level.
-



**3.06 CLEANING**

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**END OF SECTION**



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**SECTION 26 2816.16  
ENCLOSED SWITCHES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Enclosed safety switches.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- C. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum) 2013.
- D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
- E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations Current Edition, Including All Revisions.
- G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations Current Edition, Including All Revisions.
- H. UL 98 - Enclosed and Dead-Front Switches Current Edition, Including All Revisions.
- I. UL 869A - Reference Standard for Service Equipment Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
  - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
  - 3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
  - 4. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
  - C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
  - D. Field Quality Control Test Reports.
  - E. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.
-



- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 6000 - Product Requirements, for additional provisions.

## **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

## **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

## **1.08 FIELD CONDITIONS**

- A. Maintain ambient temperature between -22 degrees F and 104 degrees F during and after installation of enclosed switches.

# **PART 2 PRODUCTS**

## **2.01 MANUFACTURERS**

- A. ABB/GE: [www.geindustrial.com/#sle](http://www.geindustrial.com/#sle).
- B. Eaton Corporation: [www.eaton.com/#sle](http://www.eaton.com/#sle).
- C. Schneider Electric; Square D Products: [www.schneider-electric.us/#sle](http://www.schneider-electric.us/#sle).
- D. Siemens Industry, Inc: [www.usa.siemens.com/#sle](http://www.usa.siemens.com/#sle).
- E. Source Limitations: Furnish enclosed switches and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

## **2.02 ENCLOSED SAFETY SWITCHES**

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
1. Altitude: Less than 6,600 feet.
  2. Ambient Temperature: Between -22 degrees F and 104 degrees F.
- D. Horsepower Rating: Suitable for connected load.
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:
1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
- G. Provide with switch blade contact position that is visible when the cover is open.
- H. Conductor Terminations: Suitable for use with the conductors to be installed.
- I. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- J. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
    - a. Indoor Clean, Dry Locations: Type 1.
    - b. Outdoor Locations: Type 3R.



- K. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- L. Heavy Duty Switches:
  - 1. Comply with NEMA KS 1.
  - 2. Conductor Terminations:
    - a. Provide mechanical lugs unless otherwise indicated.
    - b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
  - 3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed safety switches.
- D. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Install enclosed switches plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 26 0526.
- H. Identify enclosed switches in accordance with Section 26 0553.

### **3.03 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
- D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

### **3.04 ADJUSTING**

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

### **3.05 CLEANING**

- A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

## **END OF SECTION**



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**SECTION 26 5100  
INTERIOR LIGHTING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Interior luminaires.
- B. Emergency lighting units.
- C. Exit signs.
- D. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 0529 - Hangers and Supports for Electrical Systems.
- B. Section 26 0533.16 - Boxes for Electrical Systems.
- C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 26 0923 - Lighting Control Devices.
  - 1. Includes automatic controls for lighting including occupancy sensors, outdoor motion sensors, time switches, outdoor photo controls, and daylighting controls.
- E. Section 26 2726 - Wiring Devices: Manual wall switches and wall dimmers.

**1.03 REFERENCE STANDARDS**

- A. NECA/IESNA 500 - Standard for Installing Indoor Lighting Systems 2006.
- B. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems 2006.
- C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 924 - Emergency Lighting and Power Equipment Current Edition, Including All Revisions.
- F. UL 1598 - Luminaires Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
  - 2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
  - 3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
  - 4. Notify Architect/Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Shop Drawings:
    - 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
-



- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
- D. Operation and Maintenance Data: Instructions for each product including information on replacement parts.
- E. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

#### **1.07 DELIVERY, STORAGE, AND PROTECTION**

- A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

#### **1.08 FIELD CONDITIONS**

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide one year manufacturer warranty for LED luminaires, including drivers.

### **PART 2 PRODUCTS**

#### **2.01 LUMINAIRE TYPES**

- A. Furnish products as indicated in luminaire schedule included on the drawings.
- B. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 LUMINAIRES**

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

#### **2.03 EMERGENCY LIGHTING UNITS**

- A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
- B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.



- C. Battery:
  - 1. Size battery to supply all connected lamps, including emergency remote heads where indicated.
- D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

#### **2.04 EXIT SIGNS**

- A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.
  - 1. Number of Faces: Single- or double-face as indicated or as required for installed location.
  - 2. Directional Arrows: As indicated or as required for installed location.

#### **2.05 ACCESSORIES**

- A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.
- B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.
- C. Provide accessory plaster frames for luminaires recessed in plaster ceilings.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

#### **3.03 INSTALLATION**

- A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.
  - B. Install products in accordance with manufacturer's instructions.
  - C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
  - D. Provide required support and attachment in accordance with Section 26 0529.
  - E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
  - F. Recessed Luminaires:
    - 1. Install trims tight to mounting surface with no visible light leakage.
  - G. Suspended Luminaires:
    - 1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
  - H. Install accessories furnished with each luminaire.
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- I. Bond products and metal accessories to branch circuit equipment grounding conductor.
- J. Emergency Lighting Units:
  - 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
- K. Exit Signs:
  - 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
- L. Install lamps in each luminaire.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - DO NOT USE BSD Quality Requirements, for additional requirements.
- B. Inspect each product for damage and defects.
- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.
- E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect/Engineer.

### **3.05 ADJUSTING**

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect/Engineer. Secure locking fittings in place.
- B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect/Engineer or authority having jurisdiction.
- C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect/Engineer or authority having jurisdiction.

### **3.06 CLEANING**

- A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

### **3.07 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. See Section 01 7900 - Demonstration and Training, for additional requirements.
- C. Just prior to Substantial Completion, replace all lamps that have failed.

### **3.08 PROTECTION**

- A. Protect installed luminaires from subsequent construction operations.

**END OF SECTION**



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**SECTION 28 4601**  
**FIRE ALARM SYSTEM (EXISTING SYSTEM)****PART 1 - GENERAL****1.01 SCOPE & RELATED DOCUMENTS**

- A. The work covered by this section of the specifications includes the furnishing of all labor, equipment, materials, and performance of all operations in connection with the modifications and additions to the existing Fire Alarm System(s) as shown on the drawings and as herein specified.
- B. The requirements of the conditions of the Contract, Supplementary Conditions and General Requirements, apply to the work specified in this section.
- C. The complete installation is to conform to the applicable sections of NFPA-72, NFPA-71, Local Code Requirements and National Electrical Code with particular attention to Article 760.
- D. Additionally, the entire installed system and all integrated system operations shall be within the guidelines of the SBCCI Standard Building Code.
- E. The work covered by this section of the specifications is to be coordinated with the related work as specified elsewhere under the project specifications.
- F. The contractor shall provide all required modifications and additions to the existing Fire Alarm System for the removal, relocation of existing devices and addition of new devices. This shall include all additional wiring, devices, modifications to the existing control panel, additional components and modules, addressable cards, testing, troubleshooting and instructions to the owner.

**1.02 QUALITY ASSURANCE**

- A. Each and all items of the Fire Alarm System shall be listed compatible with the existing system under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the "U.L." label. All control equipment is to be listed under UL category UOJZ as a single control unit. Partial listing shall NOT be acceptable.
- B. All items shall match and be of the same manufacturer as the existing system.
- C. The equipment and installation supervision furnished under this specification is to be provided by a manufacturer who has been engaged in production of this type (software driven) of equipment for at least ten (10) years, and has a fully-equipped service organization within thirty-five (35) miles of the installation.
- D. All control equipment must have transient protection devices to comply with UL864 requirements.
- E. In addition to the UL-UOJZ requirement mentioned above, the system controls shall be UL listed for Power Limited Applications per NEC 760. All circuits must be marked in accordance with NEC article 760-23.
- F. Supplier shall provide documentation that fire alarm technicians are NICET LEVEL 2 certified (minimum of four).
- G. Suppliers' service organization must have been established in the local area for a minimum of ten (10) years with ten (10) years experience on specific equipment brand supplied.

**1.03 SUBMITTALS**

- A. Submit shop drawings for each piece of equipment specified including complete wiring and connection diagrams.
  - B. All submittals shall be submitted in a single complete brochure, which shall be in the form of a soft cover binder with each group separated by an identified index tab.
  - C. Submittals that fail to comply with the above requirements will automatically be rejected.
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- D. It is the Contractor's responsibility to provide submittals in an organized and timely manner in order so as not to delay the project schedule and hamper the work of other trades.
- E. Submit certificate of Fire Alarm System operating tests.

## **PART 2 PRODUCTS**

### **2.01 PERIPHERAL DEVICES**

- A. The Contractor shall furnish and install addressable devices that are compatible with the existing Simplex fire alarm System
- B. Devices Required but not limited to:
  - 1. Manual Pull Stations
  - 2. Smoke Detectors
  - 3. Duct Smoke Detectors
  - 4. Heat Detectors
  - 5. Combination Speaker/Strobe Stations
  - 6. Visual Alarm (Strobe) Stations
  - 7. Auxiliary contacts on devices where indicated on drawings.
  - 8. Magnetic fire door holds
  - 9. Power Supplies
  - 10. Addressable Relay modules

### **2.02 MAGNETIC DOOR HOLDERS**

- A. Description: Units shall be listed to UL 228. Units shall be equipped for wall or floor mounting as indicated on plans and are complete with matching door plate and extension arms as required. Unit shall operate from a 120VAC, a 24VAC or a 24VDC source from fire alarm panel. Magnets must develop a minimum of 25 lbs. holding force for any of these voltages.
- B. Material and Finish: Match door hardware. All final hardware material and finishes must be coordinate with the GC.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Provide and install all devices in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations. All wiring shall be installed in strict compliance with all the provisions of NEC - Article 760 A and C, Power-Limited Fire Protective Signaling Circuits or if required may be reclassified as non-power limited and wired in accordance with NEC-Article 760 A and B. Upon completion, the contractor shall so certify in writing to the owner and general contractor.
  - 1. All junction boxes shall be sprayed red and labeled "Fire Alarm". Wiring color code shall be maintained throughout the installation.
- B. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.
- C. The contractor shall clean all dirt and debris from the inside and the outside of the fire alarm equipment after completion of the installation.
- D. The manufacturer's authorized representative shall provide on-site supervision of installation.

### **3.02 TESTING**

- A. The completed fire alarm system shall be fully tested in accordance with NFPA-72H by the contractor in the presence of the owner's representative and the Local Fire Marshal. Upon completion of a successful test, the contractor shall so certify in writing to the owner and general contractor.



**3.03 WARRANTY**

- A. The contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from the date of the completed and certified test or from the date of first beneficial use.
- B. The equipment manufacturer shall make available to the owner a maintenance contract proposal to provide a minimum of two (2) inspections and tests per year in compliance with NFPA-72H guidelines.

**END OF SECTION**



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**SECTION 32 5990  
RESTORATION OF SURFACES**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

**1.02 DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.**

**1.03 WORK DEFINED**

**1.04 VARIOUS TYPES OF STREET SURFACES, SHOULDERS, GUTTERS, CULVERTS, GUIDE RAILS, SIDEWALKS, DRIVEWAYS, LAWNS, LANDSCAPE, SIGNS, MAILBOXES, PLANTING BOXES, FENCES, HEDGES, WALLS, TREES, SHRUBBERY, ETC. DISTURBED, DAMAGED, OR DESTROYED DURING THE WORK SHALL BE RESTORED AND/OR REPLACED AND MAINTAINED AS SPECIFIED HEREIN AND AS SHOWN AND DIRECTED.**



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- 1.05 THE FINISHED PAVEMENTS, SHOULDERS, SIDEWALKS, AND DRIVEWAYS, GUTTERS, AND CULVERTS SHALL BE MAINTAINED IN SATISFACTORY CONDITION DURING A PERIOD OF ONE YEAR FOLLOWING FINAL ACCEPTANCE OF THE WORK.
  - 1.06 THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING AND MAINTENANCE OF ALL NEW AND RESTORED TREES, HEDGES, SHRUBS AND GRASS UNTIL FINAL ACCEPTANCE OF THE CONTRACT. ANY TREES OR PLANTINGS DAMAGED SUCH THAT THEY MAY DIE WITHIN A TIME PERIOD OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE OF WORK SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
  - 1.07 THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND RESET OR PROTECT VARIOUS EXISTING SITE AND LANDSCAPING AMENITIES TO COMPLETE THE WORK. ANY AMENITIES DISTURBED, DAMAGED, OR DESTROYED DURING THE WORK SHALL BE RESTORED AND/OR REPLACED.
  - 1.08 SUBMITTALS
  - 1.09 BEFORE REMOVING ANY HEDGES, SHRUBBERY AND TREES, OR OTHER STRUCTURE OUTSIDE THE WORK AREA, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS TO THOSE HE PROPOSES TO REMOVE SO THAT A RECORD CAN BE MADE OF THE TYPE, KIND, AND LOCATION OF SUCH ARTICLES AND THEIR CONDITION BEFORE REMOVAL. ALL ARTICLES TO BE REMOVED SHALL BE INCLUDED ON THE PROJECT VIDEO.
  - 1.10 A SCHEDULE OF REPLACEMENT OPERATIONS SHALL BE WORKED OUT BY THE CONTRACTOR AND APPROVAL OF THE ENGINEER SHALL BE OBTAINED. THE PROGRAM SHALL BE ADHERED TO AND, ANY DEVIATION SHALL BE APPROVED BY THE ENGINEER.
  - 1.11 CONCRETE MIX DESIGN FOR STRUCTURAL CONCRETE SHALL BE SUBMITTED FOR APPROVAL IN CONFORMANCE WITH SECTION 03 3000.
  - 1.12 ADEQUATE COPIES OF CERTIFICATION OF MATERIALS TO INDICATE CONFORMANCE WITH STANDARDS SPECIFIED SHALL BE SUBMITTED.
  - 1.13 PRODUCT DATA FOR SUBBASE AND PAVEMENT MATERIAL.
  - 1.14 QUALITY ASSURANCE
  - 1.15 ALL WORK IN SHALL BE PERFORMED UNDER THE DIRECTION OF INDIVIDUALS EXPERIENCED IN THE RESTORATION WORK REQUIRED.

## **PART 2 - PRODUCTS AND MATERIALS**

### **2.01 GENERAL**

- 2.02 THE MATERIALS USED IN THE RESTORATION OR REPLACEMENT SHALL PRODUCE A STREET SURFACE, SHOULDER, SIDEWALK, CURB, GUTTER, CULVERT, DRIVEWAY, OR LAWN AND LANDSCAPED AREAS, FENCES, TREES, AND SHRUBBERY EQUAL TO OR BETTER THAN THE CONDITION OF EACH BEFORE THE WORK BEGAN.

### **2.03 TREES AND SHRUBS (IF APPLICABLE)**

- 2.04 ALL TREES FOR REPLACEMENT OR NEW INSTALLATION SHALL BE HARDY, HEALTHY, NURSERY GROWN WITH STRAIGHT TRUNKS AND SINGLE LEADER, AND SYMMETRICALLY BRANCHED SIX TO SEVEN FEET FROM THE GROUND AND OF OVERALL HEIGHT OF AT LEAST TEN FEET, WITH A MINIMUM DIAMETER BREAST HEIGHT OF 3 INCHES.
- 2.05 ALL SHRUBS INCLUDING ROOT SPREAD AND BALL SIZE SHALL BE IN ACCORDANCE WITH CURRENT EDITION OF U.S.A. STANDARD FOR NURSERY STOCK.

### **2.06 TOPSOIL**

- 2.07 TOPSOIL SHALL BE APPROVED MATERIAL OBTAINED FROM EXCAVATION AND GRADING WORK UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ALL TOPSOIL SHALL BE 4 INCHES IN DEPTH.

### **2.08 PERMANENT PAVEMENT**

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**2.09 PAVEMENT MATERIALS SHALL MATCH EXISTING.**

**PART 3 - EXECUTION**

**3.01 TEMPORARY RESURFACING AND PERMANENT REPAVING GENERAL MANNER OF EXECUTION**

**3.02 IMMEDIATELY UPON COMPLETION OF REFILLING OF THE TRENCH OR EXCAVATION, THE CONTRACTOR SHALL PLACE A TEMPORARY SURFACE OVER ALL DISTURBED AREAS OF THE STREETS, DRIVEWAYS, ALLEYS, AND OTHER TRAVELED PLACES WHERE THE ORIGINAL SURFACE HAS BEEN DISTURBED BY HIS OPERATION. THE TEMPORARY SURFACE SHALL BE SAFE FOR PUBLIC TRAVEL, AND PROVIDED AT NO COST TO THE OWNER. THIS WORK SHALL BE PERFORMED PROMPTLY AND AS DIRECTED BY THE ENGINEER. IF SUCH WORK IS NOT COMPLETED WITHIN THE 24 HOURS OF WRITTEN NOTICE, THEN THE ENGINEER SHALL ORDER THE WORK DONE BY OTHERS AND THE COST OF THE SAME WILL BE DEDUCTED FROM THE CONTRACT PRICE.**

**3.03 THE TEMPORARY PAVEMENT SURFACE SHALL CONSIST OF AN ASPHALT BITUMINOUS WEARING SURFACE AND/OR GRANULAR MATERIAL PLACED UPON THE REQUIRED TRENCH BACKFILL MATERIAL. THE TEMPORARY ASPHALT SURFACE SHALL BE MAINTAINED AS NECESSARY TO MINIMIZE TRAFFIC DISTURBANCE.**

**3.04 THE PERMANENT AND FINAL REPAVING OF ALL STREETS, DRIVEWAYS, AND SIMILAR SURFACES WHERE PAVEMENT HAS BEEN REMOVED, DISTURBED, SETTLED, OR DAMAGED BY OR ON ACCOUNT OF THE WORK OF THE CONTRACTOR, SHALL BE REPAIRED AND REPLACED BY THE CONTRACTOR, BY A NEW AND SIMILAR PAVEMENT AT SUCH TIME AS DIRECTED. ALL NEW SURFACES SHALL BE REPLACED IN TYPE, KIND, AND QUALITY TO THE ORIGINAL. PAVEMENT IN STATE HIGHWAYS, COUNTY HIGHWAYS, CITY, VILLAGE, OR TOWN ROADS SHALL CONFORM TO THE REQUIREMENTS OF THEIR ESTABLISHED STANDARDS.**

**3.05 PRIOR TO PLACING NEW PAVEMENT, ANY TEMPORARY PAVEMENT SHALL BE REMOVED. ALL SERVICE BOXES, MANHOLE FRAMES, AND COVERS AND SIMILAR STRUCTURES WITHIN THE AREA OF PAVEMENT TO BE REPAIRED SHALL BE SET TO MATCH EXISTING GRADES. THE NEW PAVEMENT SHALL BE COMPACTED WITH TEN TON ROLLER. ALL JOINTS SHALL BE SAW CUT, TACK COATED, AND TRIMMED TO PROVIDE A SMOOTH SURFACE. CONTRACTOR SHALL MAINTAIN THE PERMANENT PAVEMENT FOR ONE YEAR AFTER THE PLACEMENT AND ACCEPTANCE. ANY DEPRESSION OR FAILURE OF THE PAVEMENT SHALL BE CORRECTED PROMPTLY AT NO COST TO THE OWNER.**

**3.06 TREES**

**3.07 ALL TREES SHALL BE PLACED IN ACCORDANCE WITH SUPPLIERS RECOMMENDATIONS.**

**3.08 GUTTERS, CULVERTS, AND STONE WALLS**

**3.09 THE CONTRACTOR SHALL PERMANENTLY REPAIR AND REPLACE ALL GUTTERS, CULVERTS, AND STONE WALLS, WHERE THE SAME HAVE BEEN BROKEN, INJURED, OR DISTURBED BY THE CONTRACTOR, IN EXECUTING ANY OF THE WORK COVERED BY THE CONTRACT. HE SHALL RESTORE THE SAME IN A MANNER, TO A CONDITION AND WITH MATERIAL, EITHER NEW OR OLD AS REQUIRED, SIMILAR AND EQUAL TO THAT EXISTING BEFORE SUCH CONSTRUCTION WAS MADE.**

**3.10 FENCES, GUIDE RAIL, STONE WALLS**

**3.11 WHERE IT IS NECESSARY TO REMOVE A FENCE, GUIDE RAIL, STONE WALL, OR PORTION THEREOF, THE CONTRACTOR SHALL CAREFULLY REMOVE AND PRESERVE SUCH AND, UPON COMPLETION OF THE WORK AT THAT POINT, SHALL RESTORE THE FENCE, GUIDE RAIL, OR STONE WALL TO ITS ORIGINAL POSITION IN AS GOOD CONDITION AS IT WAS BEFORE REMOVAL.**

**3.12 ANY DAMAGE CAUSED BY THE OPERATIONS OF THE CONTRACTOR UNDER THIS CONTRACT TO EITHER THE UNMOVED OR THE REMOVED PORTIONS SHALL BE RESTORED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.**

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**3.13 MAINTENANCE**

- 3.14 PROPERLY MAINTAIN ALL TURFED AREAS BY WATERING, CULTIVATING, WEEDING, MOWING, RE-SEEDING, FILLING ERODED AREAS AND ALL OTHER REPAIRS AND REPLACEMENTS UNTIL FINAL ACCEPTANCE OF THE WORK.**
- 3.15 RE-SEED ALL AREAS WHERE SEED HAS FAILED TO GERMINATE AND WHERE SEEDED AREAS HAVE BEEN DAMAGED BY EROSION, PEOPLE, VEHICULAR TRAFFIC OR OTHER CAUSES.**
- 3.16 ANY DEPRESSION OR FAILURE OF TEMPORARY OR PERMANENT PAVEMENT SHALL BE CORRECTED PROMPTLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR TO ALL EXISTING ASPHALT CONCRETE PAVEMENT IF DAMAGED AS A RESULT OF THIS WORK.**

**END OF SECTION**