# PROJECT MANUAL / TECHNICAL SPECIFICATIONS FOR

# TOWN OF MONTGOMERY POLICE STATION

106 BRACKEN ROAD
MONTGOMERY, NEW YORK, 12549

**BID DOCUMENTS:** **02-24-25**


**ARCHITECT:**

**ADG Architects**
**Jason T. Anderson Architect, P.C.**
**Architecture ■ Planning ■ Interiors**

25 Wallkill Avenue
Montgomery, NY 12549

**STRUCTURAL ENGINEER:**

**E.D. Pons and Associates, P.C.**
**Structural Engineers**

385 Wyoming Avenue,
Kingston, PA 18704

**MEP ENGINEER:**

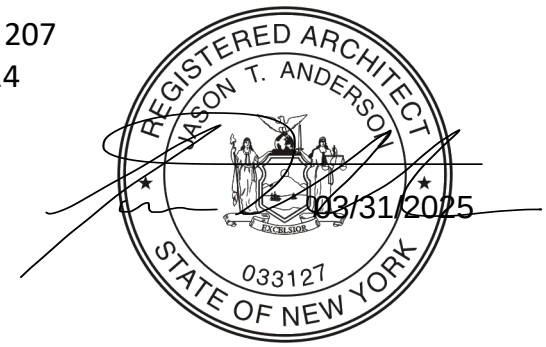
**M/E Engineering**
**Mechanical Engineers**

433 State Street, 4th Floor
Schenectady, NY 12305

**CIVIL ENGINEER:**

**Lanc & Tully Engineering and Surveying, P.C.**
**Civil Engineers**

P.O. Box 687, Rt. 207
Goshen, NY 10924

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**SECTION 00 11 13**
**ADVERTISEMENT FOR BIDS**

**FROM:**

**Town of Montgomery, herein called the owner, invites:**

Single Prime Contract for the construction of:
Town of Montgomery Police Department
106 Bracken Road, Montgomery, NY 12549

The Project consists of the new construction of a steel framed police station at the above address.

I. First Floor: 6,597 S.F. Police Station
II. Second Floor: 1,881 S.F. offices, mechanical room, storage and conference room
III. General Code Data:
1. Occupancy Classification:
Police Station: B
Records / Storage: S-1
Equipment Rooms: U
2. Construction Classification: Type IIB
IV. Structure:
1. Footings/Foundation: Spread footings over compacted soil
2. 1st floor slab: concrete slab on grade
3. 2nd floor: steel frame
4. Roof: EPDM w/metal roof @ canopies
5. General: Steel frame with ACM and masonry veneer facade
V. Egress
1. 1st Floor: Doors to grade or exterior stair; accessible - 100%
2. 2nd Floor: Exit access stair to first floor, not accessible
VI. Additional Construction Documents
1. Specification Book
2. Geotechnical Report
3. ComCheck

**The project Substantial Completion date must be September 30, 2026, and the Final completion date must be October 31, 2026.**

In accordance with New York State General Municipal Law, the Owner seeks bid for:
**Contract No. 1 - General Construction**

All under seal bids on the Bid Form provided shall be presented to the Owner's Designated Representative by the bidders or their agents on **May 14, 2025**, at **2:00 PM** in the **Office of the Town Clerk, Tara Sickles, Town Hall, 110 Bracken Road, Montgomery, New York 12549**; at which time they will be publicly opened and read. Bid Submissions must be in accordance with 00 21 13 Instructions to Bidders.

**A walk through is scheduled for 10:00 AM, April 14, 2025, at the Town Hall, located at:**
**110 Bracken Road, Montgomery, New York 12549**

The plans and specifications may be examined / obtained at the **Town of Montgomery, NY Town Hall**, between the hours of 8:30 a.m. and 4:30 p.m., Monday through Thursday, and between the

hours of 8:30 a.m. and 12:00 p.m.; starting on Monday, March 31, 2025. A bid deposit of ($100.00) payable to Town of Montgomery, NY by cash, certified check or money order is required to obtain physical copies of the documents. Physical documents can also be examined / obtained at Printeks Reprographics, Inc.; 25 Wallkill Avenue, Montgomery, New York, 12549, between the hours of 8:00 a.m. and 4:30 p.m. There shall be a ($100.00) refund for one full set of Bid Documents returned complete, undamaged, unmarked and reusable, within thirty (30) days following the award of the contract covered by such bid documents or the rejection of the bid. Failure to comply will result in forfeiture of deposit.

Electronic copies of the documents are available upon request.

**Attention is called to Section 01 32 16 "Construction Progress Schedule":**

"Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

The contractor will identify all long lead items and incorporate such items into the Critical Path. Long lead items that must be identified include, but are not necessarily limited to, the Electrical Switch Gear, Generator, Transfer Switch, HVAC Equipment for possible expedited purchase."

All technical questions, comments and inquiries should be directed to Jason T. Anderson Architect, P.C. dba ADG Architects (Attn: Sunny Adams, Project Manager) at telephone number (845) 294-2724 or email SA@ADGarchitect.com and CC: Valdete Cenelia, email VC@ADGarchitect.com.

The Contractor shall be required to provide Performance and Payment Bonds, each equal to 100% of the Contract amount and insurance coverages as specified in the Contract Documents, with the Owner, Architect and/or their Consultants named as additionally insured, and prior to final payment, a one-year Maintenance Bond against any defects in workmanship or materials in an amount equal to 10% of the Contract Price at Substantial Completion.

All bid security, whether they be bonds or certified checks, shall be made in favor without condition to Town of Montgomery, NY which check, or bond, may be forfeited should the successful bidder fail to enter into a contract with the Owner. The successful bidder shall be required to comply with the provisions of the most recent New York State Prevailing Wage and Wicks Law, Federal Regulations. The current prevailing wage schedule at the time of this bid request is attached. Additional information can be obtained at the New York State Department of Labor, Bureau of Public Work at (518) 485-5696. Please note that certified payrolls must be submitted with all invoices. Invoices will not be processed if the certified payroll is not provided. The Contractor must comply with all applicable Federal and State regulations as described in the bid documents. Sales Tax Exempt: The Contractor should not include any amount in his bid price, in accordance with the Instructions to Bidders attached herein. The Owner accepts no responsibility for any bids prior to their presentation at the date and hour indicated for formal opening. No bids will be accepted after the hour named.

**Sales Tax Exempt**: The Contractor should not include any amount for sales tax in bid price, in accordance with the Instructions to Bidders.

The Owner accepts no responsibility for any bids prior to their presentation at the date and hour indicated for formal opening. No bids will be accepted after the hour named.

Bid Bond or a Cashier's Check issued by a responsible surety, bank or trust company acceptable to the Owner (collectively, "Bid Security"), payable to the Owner, Town of Montgomery, NY, signed and sealed by the principal (Contractor) and surety. The Bid Security shall be in the amount of

FIVE PERCENT (5%) of the Bid Price.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the specifications, or the latest revision thereof, must be paid on this project. The Contractor's and their Sub-Contractor's must comply with the "Equal Opportunity for Employment" requirements as promulgated by the Federal and State governments as described in the bid documentation.

This is a public works project subject to the Prevailing Wage Schedule for an Article 8 public works project; see section 00 21 13 for instructions on how to obtain a copy of the most current schedule and PRC number.

**The Bidder is advised that the Town has elected to enter into a Project Labor Agreement (PLA), therefore, the project will be bid out under s single prime contract subject to the requirements of N.Y. Labor Law Section 222 - "Project Labor Agreements".**

**OSHA Legislation: Chapter 282 of the Laws of 2007, codified as Labor Law 220-h**;

Effective July 18, 2008: OSHA 10-hour Construction Safety and Health Course-S1537-A. This provision is an addition to the existing previling wage rate law, Labor Law:

This provision is an addition to the existing prevailing wage rate law, Labor Law 220, section 220-h.

This provision requires that all public work projects of at least $250,000.00, all laborers, workers and mechanics working on the site be certified as having successfully completed the OSHA 10-hour construction safety and health course.

The intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the contract."

Bidders may not withdraw their respective bids for a period of sixty (60) days after receipt of same by the Owner.

Based on the specifications, the Owner reserves the right to reject any and all bids, to waive informalities, and to award the contract in a manner deemed in the best interest of the Owner.

**ADDITIONAL BIDDING REQUIREMENTS ARE INCLUDED IN THE INSTRUCTIONS TO BIDDERS**

By the direction of Town of Montgomery, NY.

The Owner reserves the right to accept or reject any or all offers.

Owner reserves the right to require clarification from offerors for purposes of assuring a full understanding of responsiveness to the solicitation requirements.

**SECTION 00 21 13**
**INSTRUCTIONS TO BIDDERS**

**SUMMARY**

**DOCUMENT INCLUDES**

- Invitation
  - Bid Submission
  - Work Identified in Contract Documents
  - Contract Time
- Bid Documents and Contract Documents
  - Definitions
  - Contract Documents Identification
  - Availability
  - Examination
  - Inquiries/Addenda
  - Product/Assembly/System Substitutions
- Site Assessment
  - Site Examination
  - Pre-bid Conference
- Qualifications
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- Bid Enclosures/Requirements
  - Security Deposit
  - Consent of Surety
  - Performance Assurance
  - Insurance
  - Bid Form Requirements
  - Fees for Changes in the Work
  - Bid Form Signature
  - Additional Bid Information
  - Selection and Award of Alternates
- Offer Acceptance/Rejection
  - Duration of Offer
  - Acceptance of Offer

**RELATED DOCUMENTS**

Document 00 43 23 - Alternates Form.

Document 00 43 27 - Separate Prices Break-Out Form.

Document 00 73 00 - Supplementary Conditions:

**INVITATION**

**BID SUBMISSION**

Offers will be opened publicly immediately after the time for receipt of bids.

The Bidder is advised that the Town has elected to enter into a Project Labor Agreement (PLA), therefore, the project will be bid out under s single prime contract subject to the requirements of N.Y. Labor Law Section 222 - "Project Labor Agreements".

This is a public works project **subject to the Prevailing Wage Schedule** for an Article 8 public works project. A Prevailing Wage Case Number PRC #2024015253 has been assigned assigned to the schedule(s) for this project containing the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. The Contractor is required to comply with all applicable wage rates and applicable General Provisions of Laws Covering Workers on Public Work Contracts attached to the prevailing wage schedule. A copy of the Prevailing Wage Schedule and General Provisions can be obtained at the NYS Department of Labor.

**NOTICE:** The schedule is effective from July 2024 through June 2025. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

**INTENT**

The intent of this Bid request is to obtain an offer to perform work to complete a New Town of Montgomery Police Station located at 106 Bracken Road, Montgomery, New York for a Stipulated Sum contract, in accordance with the Contract Documents.

The Town of Montgomery is a public body and governed by the New York Freedom of Information Act. Documents submitted to the Town relating to this Request for Quote are subject to requirements of the Freedom of Information Act and may be deemed public records.

**CONTRACT TIME**

Perform the Work within the time stated in Section 01 10 00 - Summary.

The bidder, in submitting an offer, accepts the Contract Time period stated for performing the Work. The completion date in the Agreement shall be the Contract Time added to the commencement date. The bidder may suggest a revision to the Contract Time with a specific adjustment to the Bid Amount.

**BID DOCUMENTS AND CONTRACT DOCUMENTS**

**DEFINITIONS**

Bid Documents: Contract Documents supplemented with Invitation To Bid, Instructions to Bidders, Information Available to Bidders, Bid Form Supplements To Bid Forms and Appendices identified.

**AVAILABILITY**

Deposit will be refunded if Bid Documents are returned complete, undamaged, unmarked and reusable, within thirty (30) days following the award of the contract convered by such plans and specifications or the rejection of the bid. Failure to comply will result in forfeiture of deposit.

Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes.

**EXAMINATION**

Bid Documents may be viewed at the office of Town of Montgomery which is located at 110 Bracken Road, Montgomery, New York 12549.

Bid Documents may also be viewed at the office of Printeks, which is located at 25 Wallkill Ave, Montgomery, NY.

Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.

Immediately notify Architect upon finding discrepancies or omissions in the Bid Documents.

**INQUIRIES / ADDENDA**

Direct questions to Jason T. Anderson Architect, P.C., dba ADG Architects; Sunny Adams, Project Manager, email: SA@ADGarchitect.com, cc: Valdete Cenalia, email: VC@adgarchitect.com; Phone: 845-294-2724.

Addenda may be issued during the bidding period. All Addenda become part of Contract Documents. Include resultant costs in the Bid Amount.

Verbal answers are not binding on any party.

Clarifications requested by bidders must be in writing not less than 7 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients.

**PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS**

General Requirements for Substitution Requests:

Substitution Request Form:

Review and Acceptance of Request:

In submission of substitutions to products specified, bidders shall include in their bid all changes required in the work and changes to Contract Time and Contract Sum to accommodate such substitutions. A later claim by the bidder for an addition to the Contract Time or Contract Sum because of changes in work necessitated by use of substitutions shall not be considered.

**SITE EXAMINATION**

Examine the project site before submitting a bid.

The bidder is required to contact Architect at the following email address and phone number in order to arrange a date and time to visit the project site: Sunny Adams Project Manager, email: SA@ADGarchitect.com; cc: Valdete Cenalia, e-mail: VC@ADGarchitect.com; 845-294-2724.

**PREBID CONFERENCE**

A bidders conference has been scheduled for 10:00 a.m. on Thursday, the TBD day of TBD at the location of 106 Bracken Road, Montgomery, New York.

All general contract bidders and suppliers are invited.

Representatives of Architect will be in attendance.

Summarized minutes of this meeting will be circulated to attendees. These minutes will not form part of Contract Documents.

Information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

**QUALIFICATIONS**

**EVIDENCE OF QUALIFICATIONS**

To demonstrate qualification for performing the Work of this Contract, bidders will be requested to submit AIA A305 - 2020 Contractor's Qualification Statement, including Exhibits A - E.

Contractors are required to provide proof of registration as required by Labor Law Section 220-i as a minimum qualification and that failure to provide proof of registration will disqualify a bidder.

Bidders attention is called to State of New York Labor Law Section 220-I Chapter 31, Article 8:

§ 220-i. Registration system for contractors and subcontractors.
§ 220-i (6) Prohibits contractors from bidding on public work and subcontractors from commencing work unless the **contractor or subcontractor** is registered with NYSDOL. This section requires contractors to **submit their Certificate of Registration with their bid materials**.

**SUBCONTRACTORS/SUPPLIERS/OTHERS**

Owner reserves the right to reject a proposed subcontractor for reasonable cause.

Refer to General Conditions and NYS Labor Law 220.

**All subcontractors must be registered as required by Labor Law Section 220-l before commencing work on a covered project**.

**BID SUBMISSION**

**SUBMISSION PROCEDURE**

Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.

Double Envelope: Insert the closed and sealed Bid Form envelope plus requested security deposit, qualification forms and all other forms identified on the Bidder's Checklist in a large opaque envelope, and label this envelope with bidder's name, project name and Owner's name.

Improperly completed information, irregularities in security deposit, may be cause not to open the Bid Form envelope and declare the bid invalid or informal.

An abstract summary of submitted bids will be made available to all bidders following bid opening.

**BID INELIGIBILITY**

Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, will, at the discretion of the Owner, be declared unacceptable.

Bid Forms, Appendices, and enclosures improperly prepared will, at the discretion of Owner, be declared unacceptable.

**BID ENCLOSURES/REQUIREMENTS**

**SECURITY DEPOSIT**

Bids shall be accompanied by a security deposit as follows:

Bid Bond of a sum no less than 5 percent of the Bid Amount on AIA A310 Bid Bond Form.

Endorse the Bid Bond in the name of the Owner as obligee, signed and sealed by the principal (Contractor) and surety.

The security deposit will be returned after delivery to the Owner of the required Performance and Payment Bond(s) by the accepted bidder.

Include the cost of bid security in the Bid Amount.

After a bid has been accepted, all securities will be returned to the respective bidders and other requested enclosures.

The successful contractor will be required to furnish the following bonds:

a. A payment bond in an amount equal to the contract price.
b. A performance bond in an amount equal to the contract price.

If no contract is awarded, all security deposits will be returned.

**CONSENT OF SURETY**

Submit with the Bid: Attachment "Consent of Surety".

Power of Authority for Attorney-in-Fact must be attached to Consent of Surety document.

**INSURANCE**

Provide an executed "Undertaking of Insurance" on a standard form provided by the insurance company stating their intention to provide insurance to the bidder in accordance with the insurance requirements of Contract Documents - See Section 01 30 00 Administrative Requirements and AIA Document A201 - 2017 General Conditions of the Contract for Construction for insurance limits and indemnification.

**BID FORM REQUIREMENTS**

Complete all requested information in the Bid Form and Appendices.

**Sales and Use Tax Exemption**

(1) State and local sales tax on construction materials required for construction shall not be included in the Bid.

(2) Owner is exempt from payment of Sales and Compensating Use Taxes of the State of New York on all materials sold to it, used on or for the project pursuant to the provisions of the Contract Documents.

(3) There is no exemption from the sales or use tax on charges to a Contractor or subcontractor for the lease or purchase of supplies, equipment, tools, etc. used by him for the completion of the Work included in his Contract and, therefore, should be included in his Bid.

(4) Contractor(s), at the request of the Owner, shall furnish the Owner with such bills of sale and other instruments as may be required by it, properly executed, acknowledged and delivered, assuring to it title to such materials free of encumbrances and the Contractor shall mark or otherwise identify all such materials as the property of the Owner.

(5) Contractor(s), in order to purchase materials and services exempt from sales tax, shall give their suppliers and subcontractors a properly completed Contractor Exempt Purchase Certificate.

**BID FORM SIGNATURE**

The Bid Form shall be signed by the bidder, as follows:

Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.

Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.

Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so must also be submitted with the Bid Form in the bid envelope.

Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

**NON-COLLUSIVE BIDDING CERTIFICATION**

In accordance with Section 139-d of the State Finance Law and paragraph 7 of Appendix A (Standard Clauses for NYS Contracts), the bidder hereby affirms, under penalty of perjury:

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 his 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.

**A BID SHALL NOT BE CONSIDERED FOR AWARD, NOR SHALL ANY AWARD BE MADE WHERE (1), (2), (3) ABOVE HAVE NOT BEEN COMPLIED WITH; PROVIDED HOWEVER, THAT IF IN ANY CASE THE BIDDER(S) CANNOT MAKE THE FORGOING CERTIFICATION, THE BIDDER SHALL SO STATE AND SHALL FURNISH BELOW A SIGNED STATEMENT WHICH SETS FORTH IN DETAIL THE REASONS THEREFORE:**

**SEXUAL HARASSMENT PREVENTION CERTIFICATION**

New York State Finance Law § 139-l:

Pursuant to New York State Finance Law § 139-l, every bid made on or after January 1, 2019 to the State or any public department or agency thereof, where competitive bidding is required by statute, rule or regulation, for work or services performed or to be performed or goods sold or to be sold, and where otherwise required by such public department or agency, shall contain a certification 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 of its employees. Such policy shall, at a minimum, meet the requirements of New York State Labor Law § 201-g:

https://www.nysenate.gov/legislation/laws/LAB/201-G. New York State Labor Law § 201-g provides requirements for such policy and training and directs the Department of Labor, in consultation with the Division of Human Rights, to create and publish a model sexual harassment prevention guidance document, sexual harassment prevention policy and sexual harassment prevention training program that employers may utilize to meet the requirements of New York State Labor Law § 201-g. The model sexual harassment prevention policy, model sexual harassment training materials, and further guidance for employers, can be found online at the following URL: https://www.ny.gov/combating-sexual-harassment-workplace/employers RFP 2020-26 Automated System for Victim Notification Page 29

Pursuant to New York State Finance Law § 139-l, any bid by a corporate bidder containing the certification required above shall be deemed to have been authorized by the board of directors of such bidder, and such authorization shall be deemed to include the signing and submission of such bid and the inclusion therein of such statement as the act and deed of the bidder.

If the Bidder cannot make the required certification, such Bidder shall so state and shall furnish with the bid a signed statement that sets forth in detail the reasons that the Bidder cannot make the certification. After review and consideration of such statement, DOCCS may reject the bid or may decide that there are sufficient reasons to accept the bid without such certification (See Section 00 43 32).

ADDITIONAL BID INFORMATION

Submit the following Supplements concurrent with bid submission:

Document 00 43 23 - Alternates Form: Include the cost variation to the Bid Amount applicable to the Work described in Section _____.

Document 00 43 27 - Separate Prices Break-Out Form: Include a listing of separate prices as specifically requested in the Contract Documents.

SELECTION AND AWARD OF Alternates

Bids will be evaluated on the total of the base bid price and all of the Alternates. After determination of the successful bidder, consideration will be given to which Alternates will be included in the Work.

**OFFER ACCEPTANCE/REJECTION**

**DURATION OF OFFER**

Bids shall remain open to acceptance and shall be irrevocable for a period of sixty (60) days after the bid closing date.

**ACCEPTANCE OF OFFER**

Owner reserves the right to accept or reject any or all offers.

After acceptance by Owner, Owner, or Architect on behalf of Owner, will issue to the successful bidder a written Bid Acceptance.

Owner reserves the right to require clarification from offerors for purposes of assuring a full understanding of responsiveness to the solicitation requirements.

**RIGHT OF REJECTION BY THE TOWN**

The Town reserves the right to reject any and all bids and to waive any informality in a bid when to do so would be to the advantage of the Town or its taxpayers. Bids that contain conditions or limitations to the requirements set forth in the bid documents may be considered non-responsive and rejected. The Town may refuse a contract to any Contractor who, in connection with any previous contract with the Town, has failed in any respect to comply with the term of any obligation, including but not limited to, any guarantee. The Town may also refuse a contract to any Contractor whose former relations with the Town shall have been of such an unsatisfactory nature, as determined by the Town, that the Town feels justified in refraining from entering into any further business relations.

**END OF SECTION 00 21 13**

**SECTION 00 40 90**
**BIDDERS CHECKLIST**

**THE PROJECT:**

**TO:**

**Town of Montgomery**

**106 Bracken Road**

**Montgomery, New York 12549**

**DATE: _____ (Bidder to enter date)**

| REQUIRED | I.D. | TITLE | INITIALS |
|---|---|---|---|
| YES | 00 40 90 | BIDDERS CHECKLIST | |
| YES | 00 41 00 | BID FORM | |
| YES | 00 43 00 | STOCKHOLDER / PARTNERSHIP AFFIDAVIT | |
| YES | 00 43 22 | UNIT PRICES FORM | |
| YES | 00 43 23 | ALTERNATES FORM | |
| YES | 00 43 27 | SEPARATE PRICES BREAKOUT FORM | |
| YES | 00 43 29 | ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA | |
| YES | DOL FORM PW-55 | NYSDOL CERTICIATE OF REGISTRATIONS (PRIME CONTRACTOR AND ALL SUB-CONTRACTOR(S) BIDDING ON PROJECT) | |
| YES | 00 43 30 | NON-COLLUSIVE BIDDING CERTIFICATION | |
| YES | 00 43 32 | SEXUAL HARASSMENT CERTIFICATION FORM | |
| YES | 00 43 41 | IRAN DIVESTMENT CERTIFICATION | |
| YES | 00 49 50 | DISCLOSURE OF PRIOR NON-RESPONSIBILITY DETERMINATIONS | |
| YES | AIA A305 | CONTRACTORS QUALIFICATIONS STATEMENT WITH ALL SUPPORTING EXHIBITS | |
| YES | AIA A310 | BID BOND | |
| YES | AIA G715 | SUPPLEMENTAL ATTACHEDMENT FOR ACORD CERTIFICATE OF INSURANCE 25 WITH DECLARATION PAGE | |

**SIGNATURE(S)**

_____

(Bidder - print the full name of your firm)

_____

(Authorized Signature)

_____

(Print Authorized signing officer, Title)

(Seal)

**SECTION 00 41 00**
**BID FORM**

**THE PROJECT AND THE PARTIES**

**TO:**

Town of Montgomery
110 Bracken Road, Montgomery, New York 12549
Montgomery, New York12549

**FOR:**

Project: Town of Montgomery Police Station

**DATE: _____ (Bidder to enter date)**

**SUBMITTED BY: (Bidder to enter name and address)**

Bidder's Full Name _____
Address _____
City, State, Zip_____

**OFFER**

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Bid Documents prepared by Jason T. Anderson Architect, P.C. dba Andereson Design Group for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

_____
_____ dollars
($_____), in lawful money of the United States of America.

We have included the required security deposit as required by the Instruction to Bidders.

We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.

Town of Montgomery is a Sales Tax exempt governmental entity. Under Chapter 513 of the Laws of New York 1974, all materials and supplies sold to a Contactor and which are to become an integral, component part of a structure, building or real property owned by an exempt organization are exempt from the payment of New York State Sales or compensatory use taxes. Therefore, by signing below, we certify that no amount in this bid price includes price to cover sales taxes.

The Contractor expressly acknowledges that all costs, expenses and applicable taxes for materials and services that it is required to supply and perform hereunder are included in the Contract Price. Owner is a subdivision of the State of New York and is exempt from taxation. Owner is not required to pay sales taxes. Owner shall provide municipal determination letter, or will be required to reimburse Contractor for all costs and penalties incurred as a result of not doing so or not being exempt from sales tax.

**ACCEPTANCE**

This offer shall be open to acceptance and is irrevocable for sixty days from the bid closing date.

If this bid is accepted by Owner within the time period stated above, we will:
Execute the Agreement within seven days of receipt of Notice of Award.
Furnish the required bonds within seven days of receipt of Notice of Award.
Commence work within seven days after written Notice to Proceed of this bid.

If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

**CONTRACT TIME**

If this Bid is accepted, we will:

Complete the Work by the date set forth in the Standard Form of Agreement Between Owner and Contractor and as agreed upon by all parties.

**UNIT PRICES**

We have included the required Unit Prices Form.

**CHANGES TO THE WORK**

When Architect establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:

_____ percent overhead and profit on the net cost of our own Work;

_____ percent on the cost of work done by any Subcontractor.

On work deleted from the Contract, our credit to Owner shall be Architect-approved net cost plus _____ of the overhead and profit percentage noted above.

**ADDENDA**

We have included the required Acknowledgement of Receipt of Addenda. The modifications to the Bid Documents noted have been considered and all costs are included in the Bid Sum.

**BID FORM SIGNATURE(S)**

The Corporate Seal of

_____

(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

_____

(Authorized signing officer, Title)

(Seal)

_____

(Authorized signing officer, Title)

**If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.**

**END OF SECTION 00 41 00**

**SECTION 00 43 00**
**STOCKHOLDER / PARTNERSHIP AFFIDAVIT**

**STATE OF _____**

**COUNTY OF _____ ss:**

**_____ of the firm of _____,**

**being sworn according to law on his oath deposes and says that:**

**I am authorized to make this affidavit on behalf of**

**_____**

**(name of firm)**

The following are the names and addresses of all stockholders or partners in the corporation or partnership who own ten percent (10%) or more of its stock of any class, or of all individual partners in the partnership who own a ten percent (10%) or greater interest therein. If one or more such stockholders or partners is itself a corporation or partnership, the stockholders holding ten percent (10%) or more of that corporation's stock, or the individual partners owning ten percent (10%) or greater interest in the partnership that shall also be listed accordingly. This disclosure shall include names and addresses of every non-corporate stockholder, and individual partner, exceeding the ten percent (10%) ownership criteria.

I hereby certify that the following is the complete list (attach additional sheets as necessary) of all stockholders and/or partners in the corporation(s)/partnership(s) with ten percent (10%) or greater interest therein as set forth above.

_____

_____

_____

_____

_____

**By: _____**

**Title: _____**

**Subscribed and sworn to before me**

**this _____ day of _____, 20____.**

**SECTION 00 43 22**
**UNIT PRICES FORM**

**PARTICULARS**

**1.01 THE FOLLOWING IS THE LIST OF UNIT PRICES REFERENCED IN THE BID SUBMITTED BY:**

**1.02 (BIDDER) _____**

**1.03 TO (OWNER ): TOWN OF MONTGOMERY**

**1.04 DATED _____ AND WHICH IS AN INTEGRAL PART OF THE BID FORM.**

**UNIT PRICE LIST**

**2.01 ADD FOR ROCK REMOVAL: PRICE PER CUBIC YARD (SEE SECTION 31 2110)**

| | |
|---|---|
| **( Words)** | **(Figures)** |
| | |
| **( Words)** | **(Figures)** |

**END OF SECTION 00 43 22**

**SECTION 00 43 23**
**ALTERNATES FORM**

**PARTICULARS**

**THE FOLLOWING IS THE LIST OF ALTERNATES REFERENCED IN THE BID SUBMITTED BY:**

**(Bidder) _____**

**TO (Owner ): Town of Montgomery**

**Dated _____ and which is an integral part of the Bid Form.**

**ALTERNATES LIST**

**THE FOLLOWING AMOUNTS SHALL BE ADDED TO OR DEDUCTED FROM THE BID AMOUNT. REFER TO SECTION 01 23 00 - Alternates.**

**ALTERNATE # 1: ADD $ _____**

**ALTERNATE # 2: ADD $ _____**

**ALTERNATE # 3: ADD $ _____**

**ALTERNATE # 4: ADD / DEDUCT $ _____**

**ALTERNATE # 5: ADD / DEDUCT $ _____**

**ALTERNATE # 6: ADD / DEDUCT $ _____**

**ALTERNATE # EC 1: ADD / (DEDUCT) $ _____**

**END OF SECTION 00 43 23**

**SECTION 00 43 27**
**SEPARATE PRICES BREAK-OUT FORM**

**PARTICULARS**

**THE FOLLOWING IS THE LIST OF SEPARATE PRICES REFERENCED IN THE BID SUBMITTED BY:**

**(BIDDER) _____**

**DATED _____ AND WHICH IS AN INTEGRAL PART OF THE BID FORM.**

**BID BREAKDOWN:**

| General Construction | | |
|---|---|---|
| 1 | Bonds and Insurances | |
| 2 | Division 01; General Conditions | |
| 3 | Division 03; Concrete | |
| 4 | Division 04; Masonry | |
| 5 | Division 05; Metals | |
| 6 | Division 06; Wood, Plastics and Composites | |
| | Division 06; Architectural Wood Casework | |
| 7 | Division 07; Thermal and Moisture Protection | |
| 8 | Division 07; Thermal and Moisture Protection: Cladding Support System; Facade / Cladding | |
| 9 | Division 07; EPDM Roofing, (including roof insulation) | |
| 10 | Division 08; Openings (excluding Safety and Security Films as described in alternates) | |
| 11 | Division 08; Storefront and Curtainwall System (including glazing) | |
| 12 | Division 09; Finishes | |
| 13 | Division 10; Specialties (excluding Mobile Storage Shelving, Metal Storage Shelving and Metal Lockers as described in alternates) | |
| 14 | Division 12; Furnishings | |
| 15 | Division 31; Earthwork | |
| 16 | Divisions 32 & 33; Exterior Improvements, Utilities | |
| 17 | Sub-total for General Construction: | |

| Division 22 - Plumbing | | |
|---|---|---|
| 1 | General Requirements | |
| 2 | Domestic Water Piping | |
| 3 | Drain, Waste and Vent | |
| 4 | Pipe Insulation | |
| 5 | Equipment | |
| 6 | Fixtures | |
| 7 | Gas Piping | |
| 8 | Sub-total for Plumbing | |

| Division 23 - Heating, Ventilation and Air Conditioning | | |
|---|---|---|
| 1 | General Requirements | |
| 2 | Controls | |
| 3 | Equipment | |
| 4 | Ductwork | |

| | | |
|---|---|---|
| 5 | Insulation | |
| 6 | Registers and Grilles | |
| 7 | Commissioning | |
| 8 | Sub-total for HVAC | |

| Divisions 26, 27 & 28 - Electrical, Communications and Alarm | | |
|---|---|---|
| 1 | General Requirements | |
| 2 | Wiring and Devices | |
| 3 | Panelboards, Switches, Circuit Breakers | |
| 4 | Automatic Transfer Switch | |
| 5 | Lighting Fixtures | |
| 7 | Low Voltage | |
| 6 | Communications - Ring-Down Emergency Telephones | |
| 7 | Electronic Safety & Security - Analog Addressable Fire Alarm System (excluding ERCES as described in alternates) | |
| 8 | Sub-total for Electrical, Communications and Alarm | |

**PROJECT RECAP:**

| | | |
|---|---|---|
| 1 | Sub-total for General Construction: | |
| 2 | Sub-total for Plumbing: | |
| 3 | Sub-total for HVAC: | |
| 4 | Sub-total for Electrical, Communications and Alarm | |
| 4 | TOTAL -- (must equal base bid): | |

**END OF SECTION 00 43 27**

**SECTION 00 43 29**
**ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA FORM**

**PROJECT NAME:**

**Town of Montgomery Police Station**
**106 Bracken Road**
**Montgomery**
**New York**

**OWNER:**

**Town of Montgomery**

**PROJECT CONSULTANTS:**

**Architect of Record:**
**Jason T. Anderson Architect, P.C. dba ADG Architects**
Architecture + Planning + Interiors
Montgomery, New York

**Structural Engineer:**
**E. D. Pons Associates, P.C.**
Structural Engineers
Kingston, Pennsylvania

**Mechanical / Electrical / Plumbing Engineer:**
**M/E Engineering**
Engineering Consultants
Schenectady, New York

**Civil Engineer:**
**Lanc & Tully**
Engineering and Surveying, P.C.
Goshen, New York

**Receipt is hereby acknowledged for the following addenda to the drawings and specifications:**

| No. | Description | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**CONTRACTOR:**

_____
Name (Print)

_____
Title (Print)

_____
Name of Firm (Print)

_____

Address (Print)

_____

_____

City, State, Postal Code (Print)

_____

Signature

**SECTION 00 43 30**
**NON-COLLUSIVE BIDDING CERTIFICATION**

**PROJECT NAME:**

**Town of Montgomery Police Station**

**106 Bracken Road**

**Montgomery**

**New York**

**OWNER:**

**Town of Montgomery**

**110 Bracken Road, Montgomery, New York 12549**

**NON-COLLUSIVE BIDDING CERTIFICATION**

A fully executed Non-Collusive Bidding Certification must be included at the time of bid submission for the bid to be considered valid.

In accordance with Section 139-d of the State Finance Law and paragraph 7 of Appendix A (Standard Clauses for NYS Contracts), the bidder hereby affirms, under penalty of perjury:

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 his 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.

**A BID SHALL NOT BE CONSIDERED FOR AWARD NOR SHALL ANY AWARD BE MADE WHERE [1], [2], [3] ABOVE HAVE NOT BEEN COMPLIED WITH; PROVIDED HOWEVER, THAT IF IN ANY CASE THE BIDDER(S) CANNOT MAKE THE FORGOING CERTIFICATION, THE BIDDER SHALL SO STATE AND SHALL FURNISH BELOW A SIGNED STATEMENT WHICH SETS FORTH IN DETAIL THE REASONS THEREFORE:**

[AFFIX ADDENDUM TO THIS PAGE IF SPACE IS REQUIRED FOR STATEMENT.]

**SIGNATURES**

The Corporate Seal of

_____

(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

_____

(Authorized signing officer, Title)

(Seal)

_____

(Authorized signing officer, Title)

Subscribed to under penalty of perjury under the laws of the State of New York, this _____ day of _____, 20___ as the act and deed of said corporation of partnership.

The person signing on behalf of the bidder further affirms that he/she is authorized and responsible for signing this certificate.

_____

(Notary)

**SECTION 00 43 31**
**IRAN DIVESTMENT ACT CERTIFICATION**

**PROJECT NAME:**

**Town of Montgomery Police Station**
**106 Bracken Road**
**Montgomery**
**New York**

**OWNER:**

**Town of Montgomery**
**110 Bracken Road, Montgomery, New York 12549**

**IRAN DIVESTMENT ACT CERTIFICATION**

As a result of the Iran Divestment Act of 2012 (Act), Chapter 1 of the 2012 Laws of New York, a new provision has been added to the State Finance Law (SFL), 165-a, effective April 12, 2012. Under the Act, the Commissioner of the Office of General Services (OGS) will be developing a list (prohibited entities list) of "persons" who are engaged in "investment activities in Iran" (both are defined terms in the law). Pursuant to SFL 165- a(3)(b), the initial list is expected to be issued no later than 120 days after the Act' s effective date, at which time it will be posted on the OGS website

By submitting a bid in response to this solicitation or by assuming the responsibility of a Contract awarded hereunder, Bidder/Contractor (or any assignee) certifies that once the prohibited entities list is posted on the OGS website, it will not utilize on such Contract any subcontractor that is identified on the prohibited entities list.

Additionally, Bidder/Contractor is advised that once the list is posted on the OGS website, any Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to the solicitation, must certify at the time the Contract is renewed, extended or assigned that it is not included on the prohibited entities list.

During the term of the Contract, should the New York State Education Department (AGENCY) receive information that a person is in violation of the above-referenced certification, AGENCY will offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then AGENCY shall take such action as may be appropriate including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

AGENCY reserves the right to reject any bid or request for assignment for an entity that appears on the prohibited entities list prior to the award of a contract, and to pursue a responsibility review with respect to any entity that is awarded a contract and appears on the prohibited entities list after contract award.

[AFFIX ADDENDUM TO THIS PAGE IF SPACE IS REQUIRED FOR STATEMENT.]

**SIGNATURES**

_____

(Bidder - print the full name of your firm)

_____

(Signature of authorized signing officer)

_____

(Print name of authorized signing officer)

_____

(Print title of authorized signing officer)

The person signing on behalf of the bidder further affirms that he/she is authorized and responsible for signing this certificate.

# State Finance Law § 139-l Certification

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 of its employees. Such policy shall, at a minimum, meet the requirements of section two hundred one-g of the labor law.

If the bidder cannot make the foregoing certification, such bidder shall so state and shall furnish with the bid a signed statement that sets forth in detail the reasons that the bidder cannot make the certification.

**By signing you certify your express authority to sign on behalf of yourself, your company, or other entity and full knowledge and acceptance of this Certification document and that all information provided is complete, true and accurate.**

| | |
|---|---|
| | |
| **Authorized Signature** | **Date** |
| | |
| **Print Name** | **Title** |
| | |
| **Company Name** | |
| | |
| **D/B/A – Doing Business As (if applicable)** | |
| | |
| **Address** | |

| | | |
|---|---|---|
| | | |
| **City** | **State** | **Zip** |

**RETURN THIS PAGE AS PART OF THE BID**

**SECTION 00 43 40**
**SALES TAX EXEMPTION INSTRUCTIONS**

The Owner is exempt from payment of Sales and Compensating Use Taxes of the State of New York and of cities and counties on all materials sold to Owner. These taxes are not to be included in Contractor's Proposal to Owner, subcontractors Proposal to Contractor, subcontractor's proposal to subcontractor, etc.

In order to effect sales tax exemption, contract between Contractor and Owner must and will be of type whereby Contractor agrees to provide materials for a stipulated price, and to furnish and perform all work and labor required for an additional and separate stipulated price under such agreement, purchase by Contractor or materials will be a purchase or procurement for resale and therefore not subject to New York State Sales and Compensating Use Taxes or any such taxes of cities or counties. Sale of such materials by Contractor to Owner which is a tax exempt organization, will not be subject to aforesaid sales or compensating use taxes.

All subcontract, sub-subcontract, etc., or agreements shall be similar to Owner-Contractor agreement insofar as they shall stipulate a separate price to provide materials and a separate price to provide all labor and work required. All purchases by subcontractor or sub-subcontractors of materials will be purchases or procurements for resale to Contractor or subcontractor, whatever the case may be, and therefore not subject to aforesaid sales or compensating use taxes. All agreements must provide for resale of such material prior to and separate and apart from incorporation of such materials into permanent construction.

Title to all materials to be sold by contractor to Owner pursuant to provisions of Contract between contractor and Owner shall immediately vest in and become sole property of Owner upon delivery of such material to site.

Contractor shall be fully responsible for all material purchases on a resale basis, and shall protect same, maintain them in proper condition and repair, replace and make good any damage thereto without cost to the Owner until such time as work covered by documents and drawings is fully accepted by Architect and Owner.

It shall be the responsibility of Contractor and his subcontractors and materialmen to obtain any and all necessary resale exemption certificates from appropriate governmental agency or agencies, and furnish a resale certificate to all persons, firms or corporations from which they purchase materials to be incorporated into permanent construction.

It is important to note that materials and supplies purchased for performance of work but not incorporated into permanent construction may be subject to sales tax. Rental of tools, equipment and supplies may also be subject to sales tax. Such tax shall be paid by the Contractor.

**SECTION 00 49 50**
**DISCLOSURE OF PRIOR NON-RESPONSIBILITY DETERMINATIONS**

**SEE INSTRUCTIONS ON NEXT PAGE BEFORE COMPLETING THIS FORM.**

Name of Individual or Entity Seeking to Enter into the Procurement Contract:

_____

Address:

_____

Name and Title of Person Submitting this Form:_____

_____

1. Has any Governmental Entity made a finding of non-responsibility regarding the individual or entity seeking to enter into the Procurement Contract in the previous four years? (Please circle): No Yes

If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law 139-j (Please circle): No Yes

3. Was the basis for the finding of non-responsibility due to the intentional provision of false or incomplete information to a Governmental Entity? (Please circle): No Yes

4. If you answered yes to any of the above questions, please provide details regarding the finding of non-responsibility below and attach additional pages as necessary.

Governmental Entity:

_____

Date of Finding of Non-responsibility:

_____

Basis of Finding of Non-responsibility:

_____

_____

_____

5. Has any Governmental Entity or other governmental agency terminated or withheld a Procurement Contract with the above names individual or entity due to the intentional provision of false or incomplete information? (Please circle): No Yes

6. If yes, please provide details below and attach additional pages as necessary.

Governmental Entity:

_____

Date of Termination or Withholding of Contract:

_____

Basis of Termination or Withholding:

_____

_____

_____

Offeror certifies that all information provided to the Owner with respect to State Finance Law 139-k is complete, true and accurate.

Signature: _____ Date: _____

**Instructions for Completing the Bidder Disclosure of Prior Non-Responsibility Determinations**

**Background:**

New York State Finance Law §139-k(2) obligates a Governmental Entity to obtain specific information regarding prior non-responsibility determinations with respect to State Finance Law §139-j. This information must be collected in addition to the information that is separately obtained pursuant to State Finance Law §163(9). In accordance with State Finance Law §139-k, an Offeror must be asked to disclose whether there has been a finding of non-responsibility made within the previous four (4) years by any Governmental Entity due to: (a) a violation of State Finance Law §139-j or (b) the intentional provisions of false or incomplete information to a Governmental Entity. The terms "Offeror" and "Governmental Entity" are defined in State Finance Law §139-k(1). State Finance Law §139-j sets forth detailed requirements about the restrictions on Contacts during the procurement process. A violation of State Finance Law §139-j includes, but is not limited to, an impermissible Contact during the restricted period (for example, contacting a person or entity other than the designated contact person, when such contact does not fall within one of the exemptions).

As part of its responsibility determination, State Finance Law §139-k(3) mandates consideration of whether an Offeror fails to timely disclose accurate or complete information regarding the above non- responsibility determination. In accordance with law, no Procurement Contract shall be awarded to any Offeror that fails to timely disclose accurate or complete information under this section, unless a finding is made that the award of the Procurement Contract to the Offeror is necessary to protect public property or public health safety, and that the Offeror is the only source capable of supplying the required Article of Procurement within the necessary timeframe. See State Finance Law §§139-j(10)(b) and 139-k(3).

**Instructions:**

Town of Montgomery includes this disclosure request regarding prior non-responsibility determinations in accordance with State Finance Law 139-k in its solicitation of proposals or bid documents or specifications or contract documents, as applicable, for procurement contracts. The attached form is to be completed and submitted by the individual or entity seeking to enter into a Procurement Contract, Supplemental or Change Order. It shall be submitted with your Bid to the County agency conducting the Governmental Procurement.

This document must accompany each Bid Form, Letter of Interest, or Proposal submitted by all Offerors.

**END OF SECTION 00 49 50**

# AIA® Document A101® – 2017

## *Standard Form of Agreement Between Owner and Contractor* *where the basis of payment is a Stipulated Sum*

**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)*

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549
Telephone Number: (845) 457-2600
Fax Number: (845) 457-7558

and the Contractor:
*(Name, legal status, address and other information)*

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

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY 12549
New construction of a police station for the Town of Montgomery.

I. First Floor:
1. 6,597 S.F. Police Station.

II. Second Floor:
1. 1,881 Offices, Mechanical Room, Storage and Conference Room.

III. General Code Data:
1. Occupancy Classification: Police Station: B, Records/ Storage: S-1, Equipment Rooms: U
2. Construction Classification: Type IIB

IV. Structure:
1. Footings/Foundation: Spread Footings Over Compacted Soil.
2. 1st Floor Slab: Concrete Slab on Grade
3. 2nd Floor: Steel Frame
4. Roof: EPDM w/ Metal Roof @ Canopies
5. General: Steel Frame with ACM and Masonry Veneer Facade.

V. Egress:
1. 1st Floor: Doors to Grade or Exterior Stair; Accessible - 100%
2. 2nd Floor: Exit Access Stair to First Floor, Not Accessible

**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.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.
/
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VI. Additional Construction Documents
1. Specification Book
2. Geotechnical Report
3. ComCheck

The Architect:
*(Name, legal status, address and other information)*

Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, NY 12549
Telephone Number: (845) 294-2724
Fax Number: (888) 305-6442

The Owner and Contractor agree as follows.


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**TABLE OF ARTICLES**


1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

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4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS


## 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 a Modification, 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 SUBSTANTIAL COMPLETION

**§ 3.1** The date of commencement of the Work shall be:
*(Check one of the following boxes.)*

[ X ] 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

**§ 3.3.1** Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
*(Check one of the following boxes and complete the necessary information.)*



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[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ ] By the following date:

**§ 3.3.2** Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

| Portion of Work | Substantial Completion Date |
|---|---|

**§ 3.3.3** If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, 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 ($ ), subject to additions and deductions as provided in the Contract Documents.

### § 4.2 Alternates

**§ 4.2.1** Alternates, if any, included in the Contract Sum:

| Item | Price |
|---|---|

**§ 4.2.2** 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 |
|---|---|---|

**§ 4.3** Allowances, if any, included in the Contract Sum:
*(Identify each allowance.)*

| Item | Price |
|---|---|

**§ 4.4** 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) |
|---|---|---|
| Bulk Rock Removal | | |
| Trench Rock Removal | | |

**§ 4.5** Liquidated damages, if any:
*(Insert terms and conditions for liquidated damages, if any.)*

$800 per day

**§ 4.6** Other:
*(Insert provisions for bonus 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 Architect by the Contractor and Certificates for Payment issued by the 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 Architect not later than the 30th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 30th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than thirty ( 30 ) days after the Architect receives the Application for Payment.
*(Federal, state or local laws may require payment within a certain period of time.)*

**§ 5.1.4** 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 Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 5.1.5** 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.

**§ 5.1.6** In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**§ 5.1.6.1** 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.

**§ 5.1.6.2** 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 A201–2017;
- **.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 A201–2017; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

### § 5.1.7 Retainage

**§ 5.1.7.1** For each progress payment made prior to Substantial Completion of the Work, 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.)*


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5% retainage withheld for the first 50% of the construction cost for the project; followed by 2.5% retainage withheld for the final 50% of the construction cost for the project. All retainage will be released, providing that all lien waivers have been signed at substantial completion (as determined by the Architect) and subject to open items.

**§ 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 Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)*

**§ 5.1.7.3** Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, 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 at Substantial Completion shall not include retainage as follows:
*(Insert any other conditions for release of retainage upon Substantial Completion.)*

**§ 5.1.8** If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

**§ 5.1.9** 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.

**§ 5.2 Final Payment**

**§ 5.2.1** 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 A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

**.2** a final Certificate for Payment has been issued by the Architect.

**§ 5.2.2** The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

**§ 5.3 Interest**

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.)*

0 % zero percent

## ARTICLE 6 DISPUTE RESOLUTION

**§ 6.1 Initial Decision Maker**

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the 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.)*


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**§ 6.2 Binding Dispute Resolution**
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
*(Check the appropriate box.)*

[ X ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[ ] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

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** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

**§ 7.1.1** If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, 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.)*

**§ 7.2** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

**ARTICLE 8 MISCELLANEOUS PROVISIONS**
**§ 8.1** Where reference is made in this Agreement to a provision of AIA Document A201–2017 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)*

Steve Brescia
Town Supervisor
110 Bracken Road
Montgomery, NY 12549

Email Address: SBrescia@townofmontgomery.com

**§ 8.3** The Contractor's representative:
*(Name, address, email address, and other information)*


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**§ 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 A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, 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 A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

**§ 8.6** Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with a building information modeling exhibit, if completed, or as otherwise set forth below:
*(If other than in accordance with a building information modeling exhibit, 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** Other provisions:

## ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

**§ 9.1** This Agreement is comprised of the following documents:

**.1** AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

**.2** AIA Document A101™–2017, Exhibit A, Insurance and Bonds

**.3** AIA Document A201™–2017, General Conditions of the Contract for Construction

**.4** Building information modeling exhibit, dated as indicated below:
*(Insert the date of the building information modeling exhibit 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:


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*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
*(Insert the date of the E204-2017 incorporated into this Agreement.)*

[ ] The Sustainability Plan:

| Title | Date | Pages |
|---|---|---|

[ ] Supplementary and other Conditions of the Contract:

| 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 A201™–2017 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 entered into as of the day and year first written above.

| | |
|---|---|
| **OWNER** *(Signature)* | **CONTRACTOR** *(Signature)* |
| Steve Brescia, Town Supervisor<br>*(Printed name and title)* | *(Printed name and title)* |


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# *Additions and Deletions Report for*
## *AIA® Document A101® – 2017*

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

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**PAGE 1**

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549
Telephone Number: (845) 457-2600
Fax Number: (845) 457-7558

...

*(Name, location and detailed description)*

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY 12549
New construction of a police station for the Town of Montgomery.

I. First Floor:
1. 6,597 S.F. Police Station.

II. Second Floor:
1. 1,881 Offices, Mechanical Room, Storage and Conference Room.

III. General Code Data:
1. Occupancy Classification: Police Station: B, Records/ Storage: S-1, Equipment Rooms: U
2. Construction Classification: Type IIB

IV. Structure:
1. Footings/Foundation: Spread Footings Over Compacted Soil.
2. 1st Floor Slab: Concrete Slab on Grade
3. 2nd Floor: Steel Frame
4. Roof: EPDM w/ Metal Roof @ Canopies
5. General: Steel Frame with ACM and Masonry Veneer Facade.

V. Egress:
1. 1st Floor: Doors to Grade or Exterior Stair; Accessible - 100%
2. 2nd Floor: Exit Access Stair to First Floor, Not Accessible

VI. Additional Construction Documents
1. Specification Book
2. Geotechnical Report
3. ComCheck

**PAGE 2**

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Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, NY 12549
Telephone Number: (845) 294-2724
Fax Number: (888) 305-6442
**PAGE 3**

[ X ] The date of this Agreement.
**PAGE 4**

Bulk Rock Removal
Trench Rock Removal

...

$800 per day
**PAGE 5**

**§ 5.1.3** Provided that an Application for Payment is received by the Architect not later than the 30th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 30th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than thirty ( 30 ) days after the Architect receives the Application for Payment.
**PAGE 6**

5% retainage withheld for the first 50% of the construction cost for the project; followed by 2.5% retainage withheld for the final 50% of the construction cost for the project. All retainage will be released, providing that all lien waivers have been signed at substantial completion (as determined by the Architect) and subject to open items.

...

0 % zero percent
**PAGE 7**

[ X ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

...

Steve Brescia
Town Supervisor
110 Bracken Road
Montgomery, NY 12549

...

Email Address: SBrescia@townofmontgomery.com
**PAGE 9**

Steve Brescia, Town Supervisor

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# *Certification of Document's Authenticity*

*AIA® Document D401™ – 2003*

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:51:59 ET on 03/31/2025 under Order No. 4104251290 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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**User Notes:** (1294951790)

# AIA® Document A101® – 2017 Exhibit A

## *Insurance and Bonds*

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of in the year
*(In words, indicate day, month and year.)*

for the following **PROJECT**:
*(Name and location or address)*

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

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

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**THE CONTRACTOR:**
*(Name, legal status and address)*

**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 Document A201®–2017, General Conditions of the Contract for Construction. Article 11 of A201®–2017 contains additional insurance provisions.

**TABLE OF ARTICLES**

**A.1 GENERAL**

**A.2 OWNER'S INSURANCE**

**A.3 CONTRACTOR'S INSURANCE AND BONDS**

**A.4 SPECIAL TERMS AND CONDITIONS**

### ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

### ARTICLE A.2 OWNER'S INSURANCE

#### § A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.



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**§ A.2.2 Liability Insurance**
The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

**§ A.2.3 Required Property Insurance**
**§ A.2.3.1** Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

**§ A.2.3.1.1 Causes of Loss.** The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
*(Indicate below the cause of loss and any applicable sub-limit.)*

| Causes of Loss | Sub-Limit |
|---|---|

**§ A.2.3.1.2 Specific Required Coverages.** The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

| Coverage | Sub-Limit |
|---|---|

**§ A.2.3.1.3** Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

**§ A.2.3.1.4 Deductibles and Self-Insured Retentions.** If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

**§ A.2.3.2 Occupancy or Use Prior to Substantial Completion.** The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

**§ A.2.3.3 Insurance for Existing Structures**
If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.


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**§ A.2.4 Optional Extended Property Insurance.**

The Owner shall purchase and maintain the insurance selected and described below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)*

[ ] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

[ ] **§ A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[ ] **§ A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

[ ] **§ A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

[ ] **§ A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

[ ] **§ A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

[ ] **§ A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

**§ A.2.5 Other Optional Insurance.**

The Owner shall purchase and maintain the insurance selected below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)*


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[ ] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

[ ] **§ A.2.5.2 Other Insurance**
*(List below any other insurance coverage to be provided by the Owner and any applicable limits.)*

| Coverage | Limits |
|---|---|

**ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS**

**§ A.3.1 General**

**§ A.3.1.1 Certificates of Insurance.** The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

**§ A.3.1.2 Deductibles and Self-Insured Retentions.** The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

**§ A.3.1.3 Additional Insured Obligations.** To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage 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 for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

**§ A.3.2 Contractor's Required Insurance Coverage**

**§ A.3.2.1** The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
*(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

**§ A.3.2.2 Commercial General Liability**

**§ A.3.2.2.1** Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than four million ($ 4,000,000.00 ) each occurrence, four million ($ 4,000,000.00 ) general aggregate, and ($ ) aggregate for products-completed operations hazard, providing coverage for claims including

**.1** damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;

**.2** personal injury and advertising injury;

**.3** damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

**.4** bodily injury or property damage arising out of completed operations; and

**.5** the Contractor's indemnity obligations under Section 3.18 of the General Conditions.


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**§ A.3.2.2.2** The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

**.1** Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.

**.2** 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.

**.3** Claims for bodily injury other than to employees of the insured.

**.4** Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.

**.5** Claims or loss excluded under a prior work endorsement or other similar exclusionary language.

**.6** Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.

**.7** Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.

**.8** Claims related to roofing, if the Work involves roofing.

**.9** Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.

**.10** Claims related to earth subsidence or movement, where the Work involves such hazards.

**.11** Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

**§ A.3.2.3** Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than four million ($ 4,000,000.00 ) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

**§ A.3.2.4** The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

**§ A.3.2.5** Workers' Compensation at statutory limits.

**§ A.3.2.6** Employers' Liability with policy limits not less than one million ($ 1,000,000.00 ) each accident, one million ($ 1,000,000.00 ) each employee, and two million ($ 2,000,000.00 ) policy limit.

**§ A.3.2.7** Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

**§ A.3.2.8** If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than one million ($ 1,000,000.00 ) per claim and two million ($ 2,000,000.00 ) in the aggregate.

**§ A.3.2.9** If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than two million ($ 2,000,000.00 ) per claim and two million ($ 4,000,000.00 ) in the aggregate.

**§ A.3.2.10** Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than two million ($ 2,000,000.00 ) per claim and four million ($ 4,000,000.00 ) in the aggregate.


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**§ A.3.2.11** Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than one million ($ 1,000,000.00 ) per claim and two million ($ 2,000,000.00 ) in the aggregate.

**§ A.3.2.12** Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than one million ($ 1,000,000.00 ) per claim and two million ($ 2,000,000.00 ) in the aggregate.

**§ A.3.3 Contractor's Other Insurance Coverage**

**§ A.3.3.1** Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
*(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)*

**§ A.3.3.2** The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.
*(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)*

[ ] **§ A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:
*(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

[ ] **§ A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate, for Work within fifty (50) feet of railroad property.

[ ] **§ A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than ($ ) per claim and ($ ) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[ ] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[ ] **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[ ] **§ A.3.3.2.6 Other Insurance**
*(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)*


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| Coverage | Limits |
|---|---|

**§ A.3.4 Performance Bond and Payment Bond**

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
*(Specify type and penal sum of bonds.)*

| Type | Penal Sum ($0.00) |
|---|---|
| Payment Bond | |
| Performance Bond | |

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

**ARTICLE A.4 SPECIAL TERMS AND CONDITIONS**

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:


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# *Additions and Deletions Report for*

## *AIA® Document A101® – 2017 Exhibit A*

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 12:52:06 ET on 03/31/2025.

**PAGE 1**

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

...

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**PAGE 4**

**§ A.3.2.2.1** Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than four million ($ 4,000,000.00 ) each occurrence, four million ($ 4,000,000.00 ) general aggregate, and ($ ) aggregate for products-completed operations hazard, providing coverage for claims including

**PAGE 5**

**§ A.3.2.3** Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than four million ($ 4,000,000.00 ) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

...

**§ A.3.2.6** Employers' Liability with policy limits not less than one million ($ 1,000,000.00 ) each accident, one million ($ 1,000,000.00 ) each employee, and two million ($ 2,000,000.00 ) policy limit.

...

**§ A.3.2.8** If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than one million ($ 1,000,000.00 ) per claim and two million ($ 2,000,000.00 ) in the aggregate.

...

**§ A.3.2.9** If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than ~~($~~ two million ($ 2,000,000.00 ) per claim and two million ($ 4,000,000.00 ) in the aggregate.

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...

**§ A.3.2.10** Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than two million ($ 2,000,000.00 ) per claim and four million ($ 4,000,000.00 ) in the aggregate.

**PAGE 6**

**§ A.3.2.11** Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than one million ($ 1,000,000.00 ) per claim and two million ($ 2,000,000.00 ) in the aggregate.

...

**§ A.3.2.12** Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than one million ($ 1,000,000.00 ) per claim and two million ($ 2,000,000.00 ) in the aggregate.

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**User Notes:** (3B9ADA31)

# AIA® Document A201® – 2017

## *General Conditions of the Contract for Construction*

**for the following PROJECT:**
*(Name and location or address)*

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

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

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**THE ARCHITECT:**
*(Name, legal status and address)*

Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**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.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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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 a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's 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 the Owner and by Separate Contractors.

#### § 1.1.5 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.

#### § 1.1.6 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.

#### § 1.1.7 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.

#### § 1.1.8 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 complementary, 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.


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**§ 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 written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form.

### § 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 written protocols governing the use of, and reliance on, the information contained in the model 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.


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## 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 Architect does 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 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** After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.4** 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.

### § 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.

**§ 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** If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.


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**§ 2.3.4** 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.

**§ 2.3.5** 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.

**§ 2.3.6** 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.

### § 2.4 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

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 prior approval of the Architect and the 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 Architect's 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.

## 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 Architect in the Architect's 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.

**§ 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 2.3.4, 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


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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 Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the 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.

**§ 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 Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the 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 and 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. Unless the Architect 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 Work 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 and in accordance with a Change Order or Construction Change Directive.

**§ 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.


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### § 3.5 Warranty

**§ 3.5.1** The Contractor warrants to the Owner 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 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 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.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

**§ 3.7.1** Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as 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.

**§ 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.

**§ 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.

### § 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 and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect 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 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 and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that 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 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.

### § 3.8 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.


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**§ 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.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect 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 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 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.

**§ 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 Architect's approval. The Architect'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 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 perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

### § 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 similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.


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**§ 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 is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is 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 Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner 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 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 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 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,


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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 and the Architect 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.

**§ 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 Architect at the time and in the form specified by the Architect.

### § 3.13 Use of Site

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.

### § 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 or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### § 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 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 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 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 or Architect. 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.

### § 3.18 Indemnification

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, 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,


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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

### § 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** Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

### § 4.2 Administration of the Contract

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The 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. The 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.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

#### § 4.2.4 Communications

The Owner and Contractor 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 Contractor 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 Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

**§ 4.2.5** Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

**§ 4.2.6** The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the


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Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

**§ 4.2.7** 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. Review of such submittals 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 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 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.

**§ 4.2.8** The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

**§ 4.2.9** The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

**§ 4.2.10** 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 Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

**§ 4.2.11** The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

**§ 4.2.12** 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 rendered in good faith.

**§ 4.2.13** The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

**§ 4.2.14** 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.

## 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 a Separate Contractor or the subcontractors of a Separate Contractor.


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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 Owner 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 Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

**§ 5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner 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 or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner 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 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 and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner 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

- **.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.

**§ 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.


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**§ 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 and to Award Separate Contracts

**§ 6.1.1** The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. 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 separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

**§ 6.1.4** 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 and Separate 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 or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify 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 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 Contractor that are not apparent.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor 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 a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

**§ 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 or Separate Contractor as provided in Section 10.2.5.

**§ 6.2.5** The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.


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### § 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate 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 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, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner 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

**§ 7.2.1** A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect 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.

### § 7.3 Construction Change Directives

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect and signed by the Owner 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 Architect 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 Architect 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 Architect;
**.2** Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;


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.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 Architect 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 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 on the basis of net increase, if any, with respect to that change.

**§ 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 Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's 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 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 Architect will 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 Architect 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 Architect 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.


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### § 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, of 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.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15.

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## 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 Architect 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 Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

### § 9.3 Applications for Payment

**§ 9.3.1** At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect 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 or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

**§ 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 Architect, but not yet included in Change Orders.


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**§ 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.

**§ 9.3.2** 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.

**§ 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.

### § 9.4 Certificates for Payment

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor 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 Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, 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 entitled to payment in the amount certified. The foregoing representations 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 Architect. However, the issuance of a Certificate for Payment will not be a representation that the 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 Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The 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 previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from 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;


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.5 damage to the Owner or a Separate 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.

**§ 9.5.2** When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

**§ 9.5.3** When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

**§ 9.5.4** If the Architect withholds certification for payment under Section 9.5.1.3, 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 Contractor shall reflect such payment on its next Application for Payment.

### § 9.6 Progress Payments

**§ 9.6.1** After the Architect has issued a 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 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.

**§ 9.6.3** The Architect 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 Architect and Owner 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 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.


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### § 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after 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 Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner 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 that 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 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 Contractor's list, the Architect 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 Contractor's 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 to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare 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 shall 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.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, 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.


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### § 9.10 Final Completion and Final Payment

**§ 9.10.1** Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's 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 Architect's final 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.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (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 Architect so confirms, the Owner shall, upon application by the Contractor and certification by the 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 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.

### § 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;


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.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; and

.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.

**§ 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 and 10.2.1.3 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 and 10.2.1.3. 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 or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either 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 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 and Substances**

**§ 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 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 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 and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities


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proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor 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, Architect, 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 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 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 Contractor 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. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

**§ 11.1.2** The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

**§ 11.1.3** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) 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 to the Owner 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


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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.

**§ 11.2 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 the Contractor 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, 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 to the Contractor 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 Architect and Architect's consultants; and (3) 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 Architect, Architect's consultants, 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**


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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 and Architect 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 Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the 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 Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's 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 Architect has not specifically requested to examine prior to its being covered, the 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 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 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 or Architect, the Owner may correct it in accordance with Section 2.5.


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**§ 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 or Separate 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.

### § 13.2 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, 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 of 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


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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 Architect timely notice of when and where tests and inspections are to be made so that the 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 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 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 Architect of when and where tests and inspections are to be made so that the 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 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 Architect.

**§ 13.4.5** If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the 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 Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, 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 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.


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**§ 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 or entities 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 and the 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, 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 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 be certified by the Initial Decision Maker, upon application, 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 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 the 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.


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**§ 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.

## 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 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 progress of the Work. In the case of a continuing delay, only one Claim is necessary.

**§ 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.


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**§ 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 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 after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.


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**§ 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**

**§ 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.


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**§ 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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**PAGE 1**

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

...

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

...

Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

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# *Certification of Document's Authenticity*

*AIA® Document D401™ – 2003*

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:52:16 ET on 03/31/2025 under Order No. 4104251290 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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# AIA® Document A305® – 2020

## *Contractor's Qualification Statement*

**THE PARTIES SHOULD EXECUTE A SEPARATE CONFIDENTIALITY AGREEMENT IF THEY INTEND FOR ANY OF THE INFORMATION IN THIS A305-2020 TO BE HELD CONFIDENTIAL.**

**SUBMITTED BY:**
*(Organization name and address.)*

**SUBMITTED TO:**
*(Organization name and address.)*

**TYPE OF WORK TYPICALLY PERFORMED**
*(Indicate the type of work your organization typically performs, such as general contracting, construction manager as constructor services, HVAC contracting, electrical contracting, plumbing contracting, or other.)*

**THIS CONTRACTOR'S QUALIFICATION STATEMENT INCLUDES THE FOLLOWING:**
*(Check all that apply.)*

[ ] Exhibit A – General Information
[ ] Exhibit B – Financial and Performance Information
[ ] Exhibit C – Project-Specific Information
[ ] Exhibit D – Past Project Experience
[ ] Exhibit E – Past Project Experience (Continued)

**CONTRACTOR CERTIFICATION**
The undersigned certifies under oath that the information provided in this Contractor's Qualification Statement is true and sufficiently complete so as not to be misleading.

_____ _____
**Organization's Authorized Representative Signature** **Date**

_____
**Printed Name and Title**

**NOTARY**
State of:
County of:
Signed and sworn to before me this day of

_____
**Notary Signature**

**My commission expires:**

**ADDITIONS AND DELETIONS:**
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_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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# AIA® Document A305® – 2020 Exhibit A

## General Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year
*(In words, indicate day, month and year.)*

**§ A.1 ORGANIZATION**
**§ A.1.1 Name and Location**
**§ A.1.1.1** Identify the full legal name of your organization.

**§ A.1.1.2** List all other names under which your organization currently does business and, for each name, identify jurisdictions in which it is registered to do business under that trade name.

**§ A.1.1.3** List all prior names under which your organization has operated and, for each name, indicate the date range and jurisdiction in which it was used.

**§ A.1.1.4** Identify the address of your organization's principal place of business and list all office locations out of which your organization conducts business. If your organization has multiple offices, you may attach an exhibit or refer to a website.

**§ A.1.2 Legal Status**
**§ A.1.2.1** Identify the legal status under which your organization does business, such as sole proprietorship, partnership, corporation, limited liability corporation, joint venture, or other.

**.1** If your organization is a corporation, identify the state in which it is incorporated, the date of incorporation, and its four highest-ranking corporate officers and their titles, as applicable.

**.2** If your organization is a partnership, identify its partners and its date of organization.

**.3** If your organization is individually owned, identify its owner and date of organization.

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**.4** If the form of your organization is other than those listed above, describe it and identify its individual leaders:

**§ A.1.2.2** Does your organization own, in whole or in part, any other construction-related businesses? If so, identify and describe those businesses and specify percentage of ownership.

**§ A.1.3 Other Information**

**§ A.1.3.1** How many years has your organization been in business?

**§ A.1.3.2** How many full-time employees work for your organization?

**§ A.1.3.3** List your North American Industry Classification System (NAICS) codes and titles. Specify which is your primary NAICS code.

**§ A.1.3.4** Indicate whether your organization is certified as a governmentally recognized special business class, such as a minority business enterprise, woman business enterprise, service disabled veteran owned small business, woman owned small business, small business in a HUBZone, or a small disadvantaged business in the 8(a) Business Development Program. For each, identify the certifying authority and indicate jurisdictions to which such certification applies.

**§ A.2 EXPERIENCE**

**§ A.2.1** Complete Exhibit D to describe up to four projects, either completed or in progress, that are representative of your organization's experience and capabilities.

**§ A.2.2** State your organization's total dollar value of work currently under contract.

**§ A.2.3** Of the amount stated in Section A.2.2, state the dollar value of work that remains to be completed:

**§ A.2.4** State your organization's average annual dollar value of construction work performed during the last five years.

**§ A.3 CAPABILITIES**

**§ A.3.1** List the categories of work that your organization typically self-performs.

**§ A.3.2** Identify qualities, accreditations, services, skills, or personnel that you believe differentiate your organization from others.

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**§ A.3.3** Does your organization provide design collaboration or pre-construction services? If so, describe those services.

**§ A.3.4** Does your organization use building information modeling (BIM)? If so, describe how your organization uses BIM and identify BIM software that your organization regularly uses.

**§ A.3.5** Does your organization use a project management information system? If so, identify that system.

**§ A.4 REFERENCES**

**§ A.4.1** Identify three client references:
*(Insert name, organization, and contact information)*

**§ A.4.2** Identify three architect references:
*(Insert name, organization, and contact information)*

**§ A.4.3** Identify one bank reference:
*(Insert name, organization, and contact information)*

**§ A.4.4** Identify three subcontractor or other trade references:
*(Insert name, organization, and contact information)*

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## *AIA® Document A305® – 2020 Exhibit A*

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# AIA® Document A305® – 2020 Exhibit B

## *Financial and Performance Information*

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year
*(In words, indicate day, month and year.)*

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**§ B.1 FINANCIAL**

**§ B.1.1** Federal tax identification number:

**§ B.1.2** Attach financial statements for the last three years prepared in accordance with Generally Accepted Accounting Principles, including your organization's latest balance sheet and income statement. Also, indicate the name and contact information of the firm that prepared each financial statement.

**§ B.1.3** Has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, been the subject of any bankruptcy proceeding within the last ten years?

**§ B.1.4** Identify your organization's preferred credit rating agency and identification information.
*(Identify rating agency, such as Dun and Bradstreet or Equifax, and insert your organization's identification number or other method of searching your organization's credit rating with such agency.)*

**§ B.2 DISPUTES AND DISCIPLINARY ACTIONS**

**§ B.2.1** Are there any pending or outstanding judgments, arbitration proceedings, bond claims, or lawsuits against your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Exhibit A, Section 1.2, in which the amount in dispute is more than $75,000?
*(If the answer is yes, provide an explanation.)*

**§ B.2.2** In the last five years has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management:
*(If the answer to any of the questions below is yes, provide an explanation.)*

**.1** failed to complete work awarded to it?

**.2** been terminated for any reason except for an owners' convenience?

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**.3** had any judgments, settlements, or awards pertaining to a construction project in which your organization was responsible for more than $75,000?

**.4** filed any lawsuits or requested arbitration regarding a construction project?

**§ B.2.3** In the last five years, has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management; or any of the individuals listed in Exhibit A Section 1.2:
*(If the answer to any of the questions below is yes, provide an explanation.)*

**.1** been convicted of, or indicted for, a business-related crime?

**.2** had any business or professional license subjected to disciplinary action?

**.3** been penalized or fined by a state or federal environmental agency?

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# AIA® Document A305® – 2020 Exhibit C

## *Project Specific Information*

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year
*(In words, indicate day, month and year.)*

**PROJECT:**
*(Name and location or address.)*

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**CONTRACTOR'S PROJECT OFFICE:**
*(Identify the office out of which the contractor proposes to perform the work for the Project.)*

**TYPE OF WORK SOUGHT**
*(Indicate the type of work you are seeking for this Project, such as general contracting, construction manager as constructor, design-build, HVAC subcontracting, electrical subcontracting, plumbing subcontracting, etc.)*

**CONFLICT OF INTEREST**
Describe any conflict of interest your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Exhibit A Section 1.2, may have regarding this Project.

**§ C.1 PERFORMANCE OF THE WORK**
**§ C.1.1** When was the Contractor's Project Office established?

**§ C.1.2** How many full-time field and office staff are respectively employed at the Contractor's Project Office?

**§ C.1.3** List the business license and contractor license or registration numbers for the Contractor's Project Office that pertain to the Project.

**§ C.1.4** Identify key personnel from your organization who will be meaningfully involved with work on this Project and indicate (1) their position on the Project team, (2) their office

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location, (3) their expertise and experience, and (4) projects similar to the Project on which they have worked.

**§ C.1.5** Identify portions of work that you intend to self-perform on this Project.

**§ C.1.6** To the extent known, list the subcontractors you intend to use for major portions of work on the Project.

**§ C.2 EXPERIENCE RELATED TO THE PROJECT**

**§ C.2.1** Complete Exhibit D to describe up to four projects performed by the Contractor's Project Office, either completed or in progress, that are relevant to this Project, such as projects in a similar geographic area or of similar project type. If you have already completed Exhibit D, but want to provide further examples of projects that are relevant to this Project, you may complete Exhibit E.

**§ C.2.2** State the total dollar value of work currently under contract at the Contractor's Project Office:

**§ C.2.3** Of the amount stated in Section C.2.2, state the dollar value of work that remains to be completed:

**§ C.2.4** State the average annual dollar value of construction work performed by the Contractor's Project Office during the last five years.

**§ C.2.5** List the total number of projects the Contractor's Project Office has completed in the last five years and state the dollar value of the largest contract the Contractor's Project Office has completed during that time.

**§ C.3 SAFETY PROGRAM AND RECORD**

**§ C.3.1** Does the Contractor's Project Office have a written safety program?

**§ C.3.2** List all safety-related citations and penalties the Contractor's Project Office has received in the last three years.

**§ C.3.3** Attach the Contractor's Project Office's OSHA 300a Summary of Work-Related Injuries and Illnesses form for the last three years.

**§ C.3.4** Attach a copy of your insurance agent's verification letter for your organization's current workers' compensation experience modification rate and rates for the last three years.

**§ C.4 INSURANCE**

**§ C.4.1** Attach current certificates of insurance for your commercial general liability policy, umbrella insurance policy, and professional liability insurance policy, if any. Identify deductibles or self-insured retentions for your commercial general liability policy.

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**§ C.4.2** If requested, will your organization be able to provide property insurance for the Project written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis?

**§ C.4.3** Does your commercial general liability policy contain any exclusions or restrictions of coverage that are prohibited in AIA Document A101-2017, Exhibit A, Insurance A.3.2.2.2? If so, identify.

**§ C.5 SURETY**

**§ C.5.1** If requested, will your organization be able to provide a performance and payment bond for this Project?

**§ C.5.2** Surety company name:

**§ C.5.3** Surety agent name and contact information:

**§ C.5.4** Total bonding capacity:

**§ C.5.5** Available bonding capacity as of the date of this qualification statement:

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Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

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# AIA® Document A305® – 2020 Exhibit D

## *Contractor's Past Project Experience*

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| PROJECT NAME | | | | |
| PROJECT LOCATION | | | | |
| PROJECT TYPE | | | | |
| OWNER | | | | |
| ARCHITECT | | | | |
| CONTRACTOR'S PROJECT EXECUTIVE | | | | |
| KEY PERSONNEL (include titles) | | | | |
| PROJECT DETAILS | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work |
| PROJECT DELIVERY METHOD | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: |
| SUSTAINABILITY CERTIFICATIONS | | | | |

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# AIA® Document A305® – 2020 Exhibit E

## *Contractor's Past Project Experience, Continued*

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| PROJECT NAME | | | | |
| PROJECT LOCATION | | | | |
| PROJECT TYPE | | | | |
| OWNER | | | | |
| ARCHITECT | | | | |
| CONTRACTOR'S PROJECT EXECUTIVE | | | | |
| KEY PERSONNEL (include titles) | | | | |
| PROJECT DETAILS | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work | Contract Amount<br><br>Completion Date<br><br>% Self-Performed Work |
| PROJECT DELIVERY METHOD | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: | ☐ Design-bid-build<br>☐ Design-build<br>☐ CM constructor<br>☐ CM advisor<br>☐ Other: |
| SUSTAINABILITY CERTIFICATIONS | | | | |

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# AIA® Document A310™ – 2010

## *Bid Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*
Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**BOND AMOUNT:** $

**PROJECT:**
*(Name, location or address, and Project number, if any)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner 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. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, 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. When so


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**User Notes:** (1113874761)

furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of ,

| | |
|---|---|
| | *(Contractor as Principal)* *(Seal)* |
| *(Witness)* | *(Title)* |
| | *(Surety)* *(Seal)* |
| *(Witness)* | *(Title)* |

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**PAGE 1**

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

...

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

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*AIA® Document D401™ – 2003*

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:54:48 ET on 03/31/2025 under Order No. 4104251290 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A310™ – 2010, Bid Bond, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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# AIA® Document A312® – 2010

## *Payment Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*
Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**CONSTRUCTION CONTRACT**
Date:
Amount: $ 0.00
Description:
*(Name and location)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**BOND**
Date:
*(Not earlier than Construction Contract Date)*

Amount: $
Modifications to this Bond: ☐ None ☐ See Section 18

| **CONTRACTOR AS PRINCIPAL** | | **SURETY** | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | _____ | Signature: | _____ |
| Name and Title: | | Name and Title: | |

*(Any additional signatures appear on the last page of this Payment Bond.)*

*(FOR INFORMATION ONLY — Name, address and telephone)*

**AGENT** or **BROKER:**

**OWNER'S REPRESENTATIVE:**
*(Architect, Engineer or other party:)*
Steve Brescia
110 Bracken Road
Montgomery, NY 12549

Email Address:
SBrescia@townofmontgomery.com

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Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

Init.
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**§ 1** The Contractor and 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, subject to the following terms.

**§ 2** If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

**§ 3** If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

**§ 4** When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

**§ 5** The Surety's obligations to a Claimant under this Bond shall arise after the following:

**§ 5.1** Claimants, who do not have a direct contract with the Contractor,

**.1** have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

**.2** have sent a Claim to the Surety (at the address described in Section 13).

**§ 5.2** Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

**§ 6** If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

**§ 7** When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

**§ 7.1** Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

**§ 7.2** Pay or arrange for payment of any undisputed amounts.

**§ 7.3** The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

**§ 8** The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

**§ 9** 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 Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.



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**§ 10** 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 the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

**§ 11** 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.

**§ 12** No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, 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.

**§ 13** Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

**§ 14** 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. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

**§ 15** Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

**§ 16 Definitions**

**§ 16.1 Claim.** A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

**§ 16.2 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 Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. 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.

**§ 16.3 Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.



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**§ 16.4 Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

**§ 16.5 Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

**§ 17** If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

**§ 18** 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** | | **SURETY** | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | _____ | Signature: | _____ |
| Name and Title: | | Name and Title: | |
| Address: | | Address: | |


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**PAGE 1**

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

...

Amount: $ 0.00

...

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

...

Steve Brescia
110 Bracken Road
Montgomery, NY 12549

Email Address:
SBrescia@townofmontgomery.com

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I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:55:01 ET on 03/31/2025 under Order No. 4104251290 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A312™ – 2010, Payment Bond, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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# AIA® Document A312® – 2010

## *Performance Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*
Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**CONSTRUCTION CONTRACT**
Date:
Amount: $ 0.00
Description:
*(Name and location)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**BOND**
Date:
*(Not earlier than Construction Contract Date)*

Amount: $
Modifications to this Bond: ☐ None ☐ See Section 16

| **CONTRACTOR AS PRINCIPAL** | **SURETY** |
|---|---|
| Company: *(Corporate Seal)* | Company: *(Corporate Seal)* |
| Signature: _____ | Signature: _____ |
| Name and Title: | Name and Title: |

*(Any additional signatures appear on the last page of this Performance Bond.)*

*(FOR INFORMATION ONLY — Name, address and telephone)*

**AGENT** or **BROKER:**

**OWNER'S REPRESENTATIVE:**
*(Architect, Engineer or other party:)*
Steve Brescia
110 Bracken Road
Montgomery, NY 12549

Email Address:SBrescia@townofmontgomery.com

**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 Contractor, Surety, Owner or other party shall be considered plural where applicable.

Init.
/

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**§ 1** The Contractor and 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 when applicable to participate in a conference as provided in Section 3.

**§ 3** If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

**.1** the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. 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;

**.2** the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

**.3** the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

**§ 4** Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

**§ 5** 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:

**§ 5.1** Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

**§ 5.2** Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

**§ 5.3** 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 a 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 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

**§ 5.4** 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, make payment to the Owner; or

**.2** Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

**§ 6** If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven 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 5.4, and the Owner refuses the payment 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.


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**§ 7** If the Surety elects to act under Section 5.1, 5.2 or 5.3, 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. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

**.1** the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

**.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 5; and

**.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.

**§ 8** If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

**§ 9** 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, successors and assigns.

**§ 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** 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 a declaration of 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.

**§ 12** Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

**§ 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. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

**§ 14 Definitions**

**§ 14.1 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.

**§ 14.2 Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

**§ 14.3 Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

**§ 14.4 Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

**§ 14.5 Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.


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**§ 15** If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

**§ 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** | | **SURETY** | |
|---|---|---|---|
| Company: | *(Corporate Seal)* | Company: | *(Corporate Seal)* |
| Signature: | _____ | Signature: | _____ |
| Name and Title: | | Name and Title: | |
| Address: | | Address: | |


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**PAGE 1**

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

...

Amount: $ 0.00

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Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

...

Steve Brescia
110 Bracken Road
Montgomery, NY 12549

Email
Address:SBrescia@townofmontgomery.com

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*AIA® Document D401™ – 2003*

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_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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# AIA® Document C106™ – 2022

## *Digital Data Licensing Agreement*

**AGREEMENT** made as of the day of in the year
*(In words, indicate day, month, and year.)*

**BETWEEN** the Party transmitting Digital Data ("Transmitting Party"):
*(Name, address, and contact information, including electronic addresses)*

and the Party receiving the Digital Data ("Receiving Party"):
*(Name, address, and contact information, including electronic addresses)*

for the following Project:
*(Name and location or address of the Project)*

Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

for the following Digital Data ("Digital Data"):
*(Identify below, in detail, the information created or stored in digital form that the Parties intend to be subject to this Agreement.)*

The Transmitting Party and Receiving Party agree as follows.

**TABLE OF ARTICLES**


1 GENERAL PROVISIONS

2 TRANSMISSION OF DIGITAL DATA

3 LICENSE CONDITIONS

4 LICENSING FEE OR OTHER COMPENSATION


**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.

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**User Notes:** (1835169586)

## ARTICLE 1 GENERAL PROVISIONS

**§ 1.1** The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data and to set forth the license terms.

**§ 1.2** This Agreement is the entire and integrated agreement between the Parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the Parties.

**§ 1.3** Confidential Digital Data is Digital Data containing confidential or business proprietary information that the Transmitting Party designates as "confidential."

## ARTICLE 2 TRANSMISSION OF DIGITAL DATA

**§ 2.1** The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data solely and exclusively for the uses, and in accordance with the terms, set forth in Article 3.

**§ 2.2** Only the Receiving Party is permitted to access and use the Digital Data. Unlicensed and unauthorized access or use by third parties is strictly prohibited except as set forth in Section 2.4.1.

**§ 2.3** The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

**§ 2.4** Where the Transmitting Party has designated information furnished pursuant to this Agreement as "confidential," the Receiving Party shall keep the information confidential and shall not disclose it to any other person or entity except as set forth in Section 2.4.1.

**§ 2.4.1** The Receiving Party may disclose Confidential Digital Data after seven (7) days' notice to the Transmitting Party 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 Receiving Party may also disclose Confidential Digital Data 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.

**§ 2.5** By transmitting Digital Data, the Transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the Receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to those uses, and in accordance with the terms, set forth in Article 3, and nothing contained in this Agreement conveys any other right to use the Digital Data.

**§ 2.6** To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

**§ 2.7** Transmission of the Digital Data does not abridge or extinguish the Transmitting Party's rights, including, to the extent applicable, exclusive ownership interest, in such information under all applicable state, federal, and international laws including, without limitation, laws governing the protection of copyrights and intellectual property.

**§ 2.8** The provisions of this Article 2 shall survive the termination of this Agreement.

## ARTICLE 3 LICENSE CONDITIONS

**§ 3.1** The Receiving Party may use and rely upon the Digital Data to the extent set forth in this Article 3.
*(Choose only one option below.)*

[ ] **§ 3.1.1** The Digital Data is transmitted solely for the Receiving Party's information. Receiving Party acknowledges that any use of the Digital Data shall be at Receiving Party's sole risk. The Receiving Party accepts the Digital Data "as is" without any warranty or representations from the Transmitting Party as to whether the Digital Data is accurate, complete, or fit for use as intended by the Receiving Party. The Receiving Party is solely responsible for verifying whether the Digital Data is accurate, complete, or fit for the Receiving Party's intended use.


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[ ] **§ 3.1.2** Other:
*(Identify terms, permitted uses, or other conditions related to the Digital Data.)*

**§ 3.2** If no specific terms or uses are selected or set forth in Section 3.1, then the Receiving Party may use the Digital Data at its sole risk pursuant to the terms and conditions set forth in Section 3.1.1.

## ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:
*(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)*

This Agreement is entered into as of the day and year first written above and terminates one year from said date, except as set forth below.
*(Indicate when this Agreement will terminate, if other than one year from the date it was entered into, and other conditions related to termination.)*

| | |
|---|---|
| **TRANSMITTING PARTY** *(Signature)* | **RECEIVING PARTY** *(Signature)* |
| *(Printed name and title)* | *(Printed name and title)* |


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106 Bracken Road
Montgomery, NY
12549

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# *Certification of Document's Authenticity*

*AIA® Document D401™ – 2003*

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:30:14 ET on 03/31/2025 under Order No. 4104251290 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document C106™ – 2022, Digital Data Licensing Agreement, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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**User Notes:** (1835169586)

# AIA® Document G701® – 2017

## *Change Order*

**PROJECT:** *(Name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**CONTRACT INFORMATION:**
Contract For: General Construction
Date:

**CHANGE ORDER INFORMATION:**
Change Order Number: 001
Date:

**OWNER:** *(Name and address)*
Town of Montgomery

110 Bracken Road
Montgomery, NY 12549

**ARCHITECT:** *(Name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**CONTRACTOR:** *(Name and address)*

**THE CONTRACT IS CHANGED AS FOLLOWS:**
*(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)*

| | | |
|---|---|---|
| The original Contract Sum was | $ | 0.00 |
| The 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 new date of Substantial Completion will be

**NOTE:** This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

**NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.**

| | | |
|---|---|---|
| Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group | | Town of Montgomery |
| **ARCHITECT** *(Firm name)* | **CONTRACTOR** *(Firm name)* | **OWNER** *(Firm name)* |
| | | |
| **SIGNATURE** | **SIGNATURE** | **SIGNATURE** |
| Stosh Zamonsky, Senior Associate | | Steve Brescia, Town Supervisor |
| **PRINTED NAME AND TITLE** | **PRINTED NAME AND TITLE** | **PRINTED NAME AND TITLE** |
| | | |
| **DATE** | **DATE** | **DATE** |

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**User Notes:** (3B9ADA45)

# AIA® Document G702® – 1992

## *Application and Certificate for Payment*

| | | | | | |
|---|---|---|---|---|---|
| **TO OWNER:** | Town of Montgomery<br>110 Bracken Road<br>Montgomery, NY 12549 | **PROJECT:** | Town of Montgomery Police Station<br>106 Bracken Road<br>Montgomery, NY<br>12549 | **APPLICATION NO:** 001<br>**PERIOD TO:** | **Distribution to:**<br>OWNER: ☐ |
| | | | | **CONTRACT FOR:** General Construction | ARCHITECT: ☐ |
| **FROM CONTRACTOR:** | | **VIA ARCHITECT:** | Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group<br>25 Wallkill Avenue<br>Montgomery, New York 12549 | **CONTRACT DATE:**<br>**PROJECT NOS:** 23138 / / | CONTRACTOR: ☐<br>FIELD: ☐<br>OTHER : ☐ |

## CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703®, Continuation Sheet, is attached.

| | | |
|---|---|---|
| **1. ORIGINAL CONTRACT SUM** | | 0.00 |
| **2. NET CHANGE BY CHANGE ORDERS** | | 0.00 |
| **3. CONTRACT SUM TO DATE** (Line 1 ± 2) | | 0.00 |
| **4. TOTAL COMPLETED & STORED TO DATE** (Column G on G703) | | 0.00 |
| **5. RETAINAGE:** | | |
| **a.** 0 % of Completed Work (Column D + E on G703) | 0.00 | |
| **b.** 0 % of Stored Material (Column F on G703) | 0.00 | |
| 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 | |

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

**CONTRACTOR:**

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

## ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

**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.)*

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**User Notes:** (3B9ADA51)

| CHANGE ORDER SUMMARY | ADDITIONS | DEDUCTIONS |
|---|---|---|
| Total changes approved in previous months by Owner | 0.00 | 0.00 |
| Total approved this Month | 0.00 | 0.00 |
| TOTALS | 0.00 | 0.00 |
| NET CHANGES by Change Order | | 0.00 |

**ARCHITECT:**

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.

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**User Notes:** (3B9ADA51)

# AIA® Document G703® – 1992

## *Continuation Sheet*

AIA Document G702®, Application and Certification for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
Use Column I on Contracts where variable retainage for line items may apply.

**APPLICATION NO:** 001
**APPLICATION DATE:**
**PERIOD TO:**
**ARCHITECT'S PROJECT NO:** 23138

| A | B | C | D | E | F | G | | H | I |
|---|---|---|---|---|---|---|---|---|---|
| ITEM NO. | DESCRIPTION OF WORK | SCHEDULED VALUE | WORK COMPLETED FROM PREVIOUS APPLICATION (D + E) | WORK COMPLETED THIS PERIOD | MATERIALS PRESENTLY STORED (NOT IN D OR E) | TOTAL COMPLETED AND STORED TO DATE (D + E + F) | % (G÷C) | BALANCE TO FINISH (C - G) | RETAINAGE (IF VARIABLE RATE) |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% | 0.00 | 0.00 |
| | **GRAND TOTAL** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **0.00%** | **$0.00** | **$0.00** |

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**User Notes:** (3B9ADAA7)

# AIA® Document G704® – 2017

## *Certificate of Substantial Completion*

| | | |
|---|---|---|
| **PROJECT:** *(name and address)*<br>Town of Montgomery Police Station<br>106 Bracken Road<br>Montgomery, NY<br>12549 | **CONTRACT INFORMATION:**<br>Contract For: General Construction<br>Date: | **CERTIFICATE INFORMATION:**<br>Certificate Number: 001<br>Date: |
| **OWNER:** *(name and address)*<br>Town of Montgomery<br><br>110 Bracken Road<br>Montgomery, NY 12549 | **ARCHITECT:** *(name and address)*<br>Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group<br>25 Wallkill Avenue<br>Montgomery, New York 12549 | **CONTRACTOR:** *(name and address)* |

The Work identified below has been reviewed and found, to the 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 is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.
*(Identify the Work, or portion thereof, that is substantially complete.)*

| Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group | | Stosh Zamonsky, Senior Associate | |
|---|---|---|---|
| **ARCHITECT** *(Firm Name)* | **SIGNATURE** | **PRINTED NAME AND TITLE** | **DATE OF SUBSTANTIAL COMPLETION** |

**WARRANTIES**
The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
*(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)*

**WORK TO BE COMPLETED OR CORRECTED**
A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:
*(Identify the list of Work to be completed or corrected.)*

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. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within ( ) days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: $

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:
*(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)*

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

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**User Notes:** (3B9ADA42)

| CONTRACTOR *(Firm Name)* | SIGNATURE | PRINTED NAME AND TITLE | DATE |
|---|---|---|---|
| Town of Montgomery | | Steve Brescia, Town Supervisor | |
| **OWNER** *(Firm Name)* | **SIGNATURE** | **PRINTED NAME AND TITLE** | **DATE** |

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**User Notes:** (3B9ADA42)

# AIA® Document G705™ – 2001

## *List of Subcontractors*

**PROJECT:** *(Name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**DATE:**

**TO ARCHITECT:** *(Name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**ARCHITECT'S PROJECT NUMBER:**
23138

**FROM CONTRACTOR:** *(Name and address)*

**CONTRACTOR'S PROJECT NUMBER:**

*(List Subcontractors and others proposed to be employed on the above Project as required by the bidding documents.)*

| Work/Firm Name | Address/Phone | Superintendent |
|---|---|---|

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**User Notes:** (3B9ADA3D)

# AIA® Document G706® – 1994

## *Contractor's Affidavit of Payment of Debts and Claims*

| | | |
|---|---|---|
| **PROJECT:** *(Name and address)*<br>Town of Montgomery Police Station<br>106 Bracken Road<br>Montgomery, NY<br>12549 | **ARCHITECT'S PROJECT NUMBER:**<br>23138<br><br>**CONTRACT FOR:** General Construction | OWNER: ☐<br>ARCHITECT: ☐<br>CONTRACTOR: ☐<br>SURETY: ☐<br>OTHER: ☐ |
| **TO OWNER:** *(Name and address)*<br>Town of Montgomery<br>110 Bracken Road<br>Montgomery, NY 12549 | **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

*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).

**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:

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**User Notes:** (3B9ADA53)

# AIA® Document G706®A – 1994

## *Contractor's Affidavit of Release of Liens*

| | | |
|---|---|---|
| **PROJECT:** *(Name and address)*<br>Town of Montgomery Police Station<br>106 Bracken Road<br>Montgomery, NY<br>12549 | **ARCHITECT'S PROJECT NUMBER:**<br>23138<br>**CONTRACT FOR:** General Construction | OWNER: ☐<br>ARCHITECT: ☐<br>CONTRACTOR: ☐ |
| **TO OWNER:** *(Name and address)*<br>Town of Montgomery<br>110 Bracken Road<br>Montgomery, NY 12549 | **CONTRACT DATED:** | SURETY: ☐<br>OTHER: ☐ |

**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:

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**User Notes:** (3B9ADA5B)

# AIA® Document G707™ – 1994

## *Consent Of Surety to Final Payment*

**PROJECT:** *(Name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**ARCHITECT'S PROJECT NUMBER:** 23138

**CONTRACT FOR:** General Construction

**CONTRACT DATED:**

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

**TO OWNER:** *(Name and address)*
Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(*Insert name and address of Surety*)

, SURETY,

on bond of
*(Insert name and address of Contractor)*

, CONTRACTOR,

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)*

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

, 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)*

Attest:
(Seal):

*(Printed name and title)*

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**User Notes:** (3B9ADA56)

# AIA® Document G707A™ – 1994

## *Consent of Surety to Reduction in or Partial Release of Retainage*

**PROJECT:** *(Name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**ARCHITECT'S PROJECT NUMBER:** 23138

**CONTRACT FOR:** General Construction

**CONTRACT DATED:**

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

**TO OWNER:** *(Name and address)*
Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
*(Insert name and address of Surety)*

, SURETY,

on bond of
*(Insert name and address of Contractor)*

, CONTRACTOR,

hereby approves the reduction in or partial release of retainage to the Contractor as follows:

The Surety agrees that such reduction in or partial release of retainage to the Contractor shall not relieve the Surety of any of its obligations to
*(Insert name and address of Owner)*

Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

, 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)*

Attest:
(Seal):

_____
*(Printed name and title)*

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**User Notes:** (3B9ADA63)

# AIA® Document G709™ – 2018

## *Proposal Request*

**PROJECT:** *(name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**CONTRACT INFORMATION:**
Contract For: General Construction
Date:

Architect's Project Number: 23138
Proposal Request Number:
Proposal Request Date:

**OWNER:** *(name and address)*
Town of Montgomery

110 Bracken Road
Montgomery, NY 12549

**ARCHITECT:** *(name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**CONTRACTOR:** *(name and address)*

The Owner requests an itemized proposal for changes to the Contract Sum and Contract Time for proposed modifications to the Contract Documents described herein. The Contractor shall submit this proposal within Zero (0) days or notify the Architect in writing of the anticipated date of submission.
*(Insert a detailed description of the proposed modifications to the Contract Documents and, if applicable, attach or reference specific exhibits.)*

**THIS IS NOT A CHANGE ORDER, A CONSTRUCTION CHANGE DIRECTIVE, OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED IN THE PROPOSED MODIFICATIONS.**

**REQUESTED BY THE ARCHITECT:**

**PRINTED NAME AND TITLE**

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**User Notes:** (3B9ADA4B)

# AIA® Document G710™ – 2017

## *Architect's Supplemental Instructions*

**PROJECT:** *(name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**CONTRACT INFORMATION:**
Contract For: General Construction
Date:

**ASI INFORMATION:**
ASI Number:
Date:

**OWNER:** *(name and address)*
Town of Montgomery

110 Bracken Road
Montgomery, NY 12549

**ARCHITECT:** *(name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**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:**

Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
**ARCHITECT** *(Firm name)*

**SIGNATURE**

Stosh Zamonsky, Senior Associate
**PRINTED NAME AND TITLE**

**DATE**

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# AIA® Document G714® – 2017

## *Construction Change Directive*

**PROJECT:** *(name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**CONTRACT INFORMATION:**
Contract For: General Construction
Date:

**CCD INFORMATION:**
Directive Number:
Date:

**OWNER:** *(name and address)*
Town of Montgomery

110 Bracken Road
Montgomery, NY 12549

**ARCHITECT:** *(name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**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 . The proposed adjustment, if any, is .

*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.

| | | |
|---|---|---|
| Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group | Town of Montgomery | |
| **ARCHITECT** *(Firm name)* | **OWNER** *(Firm name)* | **CONTRACTOR** *(Firm name)* |
| **SIGNATURE** | **SIGNATURE** | **SIGNATURE** |
| Stosh Zamonsky, Senior Associate | Steve Brescia, Town Supervisor | |
| **PRINTED NAME AND TITLE** | **PRINTED NAME AND TITLE** | **PRINTED NAME AND TITLE** |

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| | | |
|---|---|---|
| **DATE** | **DATE** | **DATE** |

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**User Notes:** (3B9ADA3B)

# AIA® Document G715™ – 2017

## *Supplemental Attachment for ACORD Certificate of Insurance 25*

**PROJECT:** *(name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**CONTRACT INFORMATION:**
Contract For: General Construction
Date:

**CERTIFICATE INFORMATION:**
Producer:
Insured:
Date:

**OWNER:** *(name and address)*
Town of Montgomery

110 Bracken Road
Montgomery, NY 12549

**ARCHITECT:** *(name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**CONTRACTOR:** *(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? | ☐ | ☐ | ☐ |
| **b** | Personal injury and advertising injury? | ☐ | ☐ | ☐ |
| **c** | Damages because of physical damage to or destruction of tangible property, including the loss of use of such property? | ☐ | ☐ | ☐ |
| **d** | Bodily injury or property damage arising out of completed operations? | ☐ | ☐ | ☐ |
| **e** | The Contractor's indemnity obligations included in the Contract Documents? | ☐ | ☐ | ☐ |
| **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? | ☐ | ☐ | ☐ |
| **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? | ☐ | ☐ | ☐ |
| **c** | Claims for bodily injury other than to employees of the insured? | ☐ | ☐ | ☐ |
| **d** | Claims for the Contractor's indemnity obligations included in the Contract Documents arising out of injury to employees of the insured? | ☐ | ☐ | ☐ |
| **e** | Claims for loss excluded under a prior work endorsement or other similar exclusionary language? | ☐ | ☐ | ☐ |
| **f** | Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language? | ☐ | ☐ | ☐ |
| **g** | Claims related to residential, multi-family, or other habitational projects? | ☐ | ☐ | ☐ |
| **h** | Claims related to roofing? | ☐ | ☐ | ☐ |
| **i** | Claims related to exterior insulation finish systems, synthetic stucco, or similar exterior coatings or surfaces? | ☐ | ☐ | ☐ |
| **j** | Claims related to earth subsistence or movement? | ☐ | ☐ | ☐ |
| **k** | Claims related to explosion, collapse, and underground hazards? | ☐ | ☐ | ☐ |

| **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: | | | |

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| | | | | |
|---|---|---|---|---|
| **b** | Pollution liability insurance<br>Coverage limits: | ☐ | ☐ | ☐ |
| **c** | Insurance for maritime liability risks associated with the operation of a vessel<br>Coverage limits: | ☐ | ☐ | ☐ |
| **d** | Insurance for the use or operation of manned or unmanned aircraft<br>Coverage limits: | ☐ | ☐ | ☐ |
| **e** | Property insurance<br>Coverage limits: | ☐ | ☐ | ☐ |
| **f** | Railroad protective liability insurance<br>Coverage limits: | ☐ | ☐ | ☐ |
| **g** | Asbestos abatement liability insurance<br>Coverage limits: | ☐ | ☐ | ☐ |
| **h** | Insurance for physical damage to property while it is in storage and in transit to the construction site<br>Coverage limits: | ☐ | ☐ | ☐ |
| **i** | Other: | ☐ | ☐ | ☐ |

_____

*(Authorized Representative)*

_____

*(Date of Issue)*

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# AIA® Document G716™ – 2004

## *Request for Information ("RFI")*

**TO:**

**FROM:**

**PROJECT:**
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**ISSUE DATE:**

**RFI No.**

**REQUESTED REPLY DATE:**

**PROJECT NUMBERS:** 23138 /

**COPIES TO:**

**RFI DESCRIPTION:** *(Fully describe the question or type of information requested.)*

**REFERENCES/ATTACHMENTS:** *(List specific documents researched when seeking the information requested.)*
**SPECIFICATIONS:** **DRAWINGS:** **OTHER:**

**SENDER'S RECOMMENDATION:** *(If RFI concerns a site or construction condition, the sender may provide a recommended solution, including cost and/or schedule considerations.)*

**RECEIVER'S REPLY:** *(Provide answer to RFI, including cost and/or schedule considerations.)*

| BY | DATE | COPIES TO |
|---|---|---|

**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, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.

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**User Notes:** (3B9ADA42)

# AIA® Document G804™ – 2001

## *Register of Bid Documents*

**PROJECT:** *(Name and address)*
Town of Montgomery Police Station
106 Bracken Road
Montgomery, NY
12549

**PROJECT NUMBER:** 23138
**ADVERTISEMENT OR INVITATION TO BIDDERS:**
**DATE PUBLISHED:**

**OWNER:** *(Name and address)*
Town of Montgomery
110 Bracken Road
Montgomery, NY 12549

**ARCHITECT:** *(Name and address)*
Jason T. Anderson Architect, P.C. dba ADG Architects and
Anderson Design Group
25 Wallkill Avenue
Montgomery, New York 12549

**SOLICITATION TYPE:**
☐ open ☐ invited ☐ list ☐ pre-qualified ☐ other

**RELEASE OF DOCUMENT DATE:**
**BIDS DUE ON:** *(Date and time)*
**AT:** *(Address)*

**DEPOSIT:**
**REFUND:**
**FORFEITURE DATE:**
**SPECIAL INSTRUCTIONS:**

**ADDENDA:** *(Indicate issue date)* 1. 2. 3. 4. 5. 6.

| Bidder | Bid Received | Addenda Issued | Recipient *(Company name, address, phone and fax numbers)* | Deposit / Refund | Documents |
|---|---|---|---|---|---|
| | | | | Date Received:<br>$ Received: | Date Issued:<br># of Sets Issued: |
| | | | | Date Received:<br>$ Received: | Date Issued:<br># of Sets Issued: |
| | | | | Date Received:<br>$ Received: | Date Issued:<br># of Sets Issued: |
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| | | | | Date Received:<br>$ Received: | Date Issued:<br># of Sets Issued: |

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**User Notes:** (3B9ADA38)

ATTACHMENT A

GEOTECHNICAL REPORT

**KEVIN L. PATTON, P.E.**
**36 PATTON ROAD**
**NEWBURGH, N.Y. 12550**
**845 275-7732 PATTONGEOTECH.COM**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects<br>25 Wallkill Avenue<br>Montgomery, NY 12549 | PROJECT:<br><br>PROJ. No.:<br>DATE: | New Police Station<br>Town of Montgomery, N.Y.<br>24203<br>June 13, 2024 |

# GEOTECHNICAL INVESTIGATION REPORT

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SOIL TECHNICAL NOTES
BORING LOCATIONS
SUBSURFACE PROFILE
SOIL BORING LOGS
ROCK CORE LOGS
LABORATORY TEST REPORTS
BEDROCK GEOLOGIC MAP
SURFICIAL GEOLOGIC MAP
USDA SOIL REPORT DATA

**1. PROJECT DESCRIPTION**

A geotechnical investigation using soil borings was performed and this report was prepared, to evaluate the subgrade conditions and to provide recommendations for construction of a new police station building, and for an associated retaining wall. Soil borings were drilled, laboratory tests were performed and additional research was conducted to evaluate the typical subsurface conditions. The findings of the investigation are summarized in this report, which includes recommendations for design and construction.

The proposed building is to be constructed at the southwest corner of the existing Town facility, with more than half overlying the existing front parking lot, extending onto the adjacent lawn areas and up to the edge of the woods to the west. The proposed retaining wall will be built in this wooded area, which slopes down into the edge of a wetland at about 406 feet elevation. The proposed building has dimensions of approximately 72x94 feet with a first-floor elevation of 421.25 feet; the existing elevations are approximately 416 to 421 feet in the building area. A segmental retaining wall is proposed. It will be approximately 225 feet long, with a maximum exposed height of about fourteen feet; it will be relatively distant from the building.

The Surficial Geologic Map of New York State (N.Y. State Museum, 1989,) indicates that the site is in a area of glacial till with bedrock typically within three to ten feet of the surface. The USDA Soil Survey indicates that the native topsoil type in most of the project area is Bath-Nassau complex, with Alden silt loam along the west side, extending from the wetland into the proposed retaining wall area. Bath and Nassau channery silt loams form over shallow till deposits, typically composed of gravel with some silty clay and little sand, with channers (flat stones.) Bedrock is normally at about 17 to 51 inches depth. Alden soils form by sediment deposition in low spots on top of glacial till deposits and typically have a silty, clayey or sandy texture. The soils encountered in the borings were generally consistent with the Soil Survey data, with some minor areas of fill also present

The local bedrock is thinly-layered gray siltstone, shale and sandstone of the Ordovician-age Normanskill formation. Bedrock was encountered in the borings at depths of approximately nine to fifteen feet and was cored in two of the borings.

**2. SOIL INVESTIGATION AND TEST RESULTS**

Eight soil borings were drilled on May 7 and 8, 2024, five in the proposed building area and three along the line of the proposed segmental retaining wall. Borings were drilled by the hollow-stem auger method, using a track-mounted drill rig. Rock cores were drilled in two of the borings. Drilling was performed by General Borings, Inc. of Prospect, Connecticut. The subsurface investigation was supervised and witnessed by Warren Patton, under the direction of Kevin Patton, P.E.

Soil sampling and testing were performed by the Standard Penetration Test (SPT,) using an Automatic Hammer, in accordance with ASTM D1586 (Standard Method for Penetration Test and Split-Barrel Sampling of Soils.) The SPT provides the Blow Count "N" Value, equal to the number of blows of the 140-pound steel hammer that were required to drive the 2-inch outside diameter split-spoon sampling tube into the soil, over a twelve-inch increment. Soil samples are also recovered by this method, and additional tests were performed in the field and lab, as noted on the soil boring log, using a hand penetrometer to test bearing capacity. Laboratory testing was performed on representative soil samples, for moisture content,

particle size distribution and Atterberg Limits. USCS classifications of the soil, per ASTM D2487 and D2488, are provided on the logs and on the subsurface profile drawing.



PHOTO 1. West part of the project area, facing north, April 9, 2024. The new building will be to the right and the retaining wall will run along the edge of the wooded area.

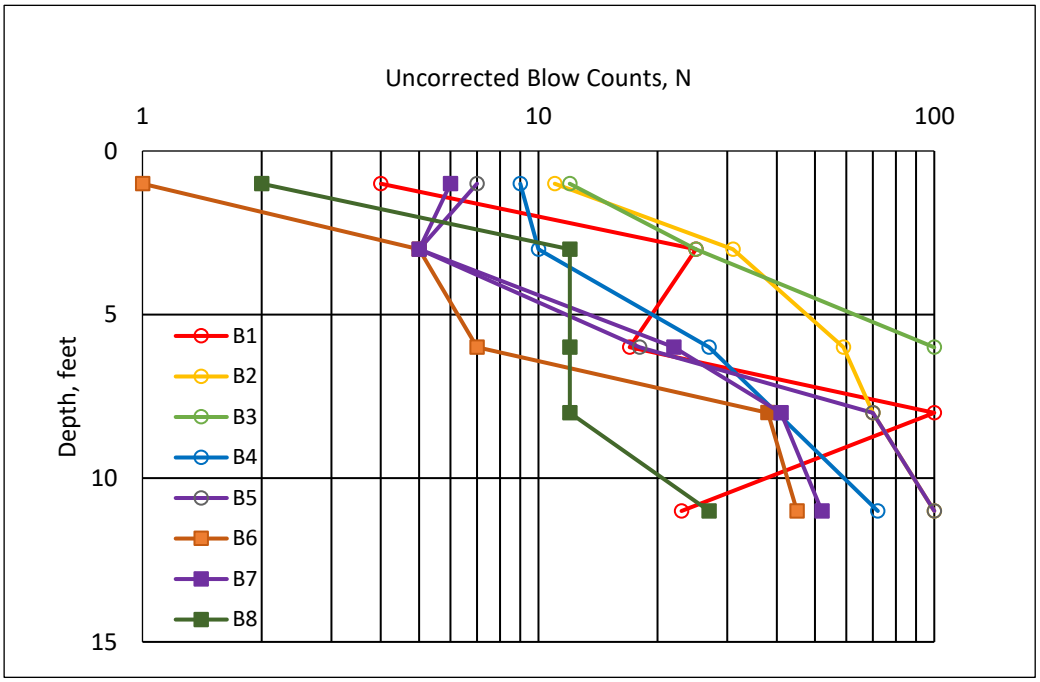


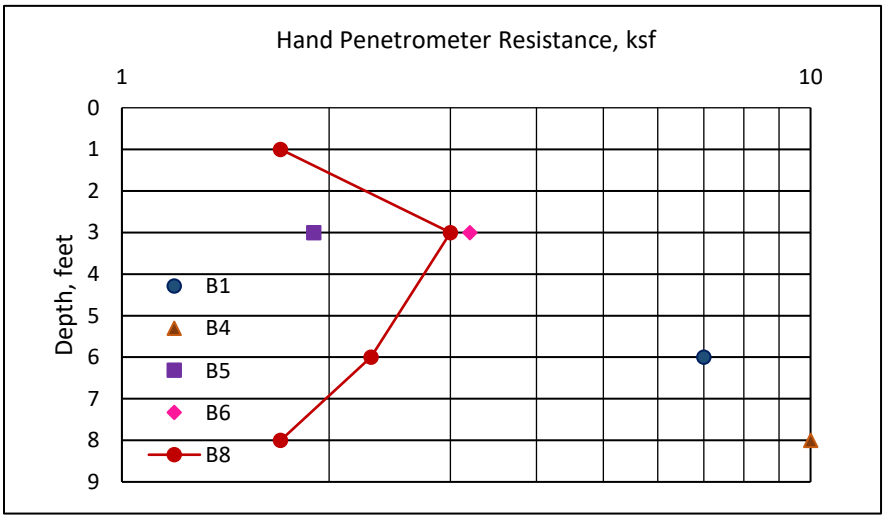
PHOTO 2. Conditions in the wetland area immediately to the west of the project, April 9, 2024.

**2.1. Soil Boring Blow Count and Laboratory Data**

| Field Blow Count Values, N | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Boring No. | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
| Approx. Elevation | 418 | 419 | 420 | 420 | 416 | 414 | 408 | 410 |
| Depth, ft.: 1 | 4 | 11 | 12 | 9 | 7 | 1/12″ | 6 | 2 |
| 3 | 25 | 31 | 25 | 10 | 5 | 5 | 5 | 12 |
| 6 | 17 | 59 | 103 | 27 | 18 | 7 | 22 | 12 |
| 8 | 115/8″ | 70 | | 40 | 70 | 38 | 41 | 12 |
| 11 | 23 | 50/1″ | | 72 | 50/1″ | 45 | 52 | 27 |
| Refusal, ft | 15.0 | 10.0 | 9.5 | 13.5 | 10.0 | 11.5 | 13.0 | 13.0 |
| Cored: | 15-25 | | | | 10-15 | | | |
| Depth to Bearing* | 2.5 | 1.0 | 0 | 3.5 | 5.0 | 6.5 | 5.5 | 2.5 |

*Depth in feet to bottom of loose/soft soils.



| Natural Moisture Content, Percent | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Depth, feet | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
| 1 | 12.6 | 7.6 | 4.2 | 9.3 | 12.3 | 10.5 | 19.1 | 21.9 |
| 3 | 10.2 | 7.9 | 11.5 | 13.8 | 24.5* | 12.4 | 21.8 | 18.4 |
| 6 | 11.9* | 7.6* | 3.7 | 7.5 | | 23.9 | | 15.9 |
| 8 | 4.4 | | | 10.4* | 9.2 | 11.3 | 11.5 | 15.9 |
| 11 | 11.8 | | | 10.7 | | | 10.4 | 10.4 |

*Approximate, from hydrometer test sample preparation.

| SOIL TEXTURE | | | | | |
|---|---|---|---|---|---|
| Sample | | B1-S3 | B2-S4 | B4-S4 | B5-S2 |
| Depth | | 6 feet | 8 feet | 8 feet | 3 feet |
| USCS Class | | SC-SM | SM | SM | CL |
| **Particle Size Analysis** | | | | | |
| Sieve Size | mm | Percent Passing by Weight | | | |
| ¾″ | 19.0 | 92 | 100 | 100 | 100 |
| #4 | 4.75 | 76 | 66 | 69 | 91 |
| #10 | 2.00 | 64 | 48 | 55 | 82 |
| #40 | 0.425 | 48 | 32 | 38 | 72 |
| #200 | 0.075 | 33 | 23 | 21 | 58 |
| Hydrometer | 0.050 | 28 | 20 | 17 | 50 |
| | 0.005 | 7 | 7 | 5 | 12 |
| | 0.002 | 2 | 2 | 1 | 2 |
| **Atterberg Limits** | | | | | |
| Liquid Limit | | 19 | - | - | 27 |
| Plastic Limit | | 13 | - | - | 19 |
| Plasticity Index | | 6 | - | - | 8 |

The Standard Penetration Test results (blow counts) in borings B1, B2 and B3 (existing parking lot) indicated medium-dense soils within thirty inches of the surface, then medium-dense to very dense soils and weathered rock, until refusal on bedrock. Boring B4, east of the existing parking lot, was similar, with slightly loose soils extended to 3.5 feet depth. At the proposed west building corner boring B5 encountered about 4.5 feet of soft, wet soils. At the north end of the proposed retaining wall, boring B8 encountered 2.5 feet of soft soil, then stiff soils to about nine feet, where the soils became medium-dense. The other three borings encountered five to 6.5 feet of soft and loose soils over medium-dense to very dense soils.

Hand penetrometer tests were performed on several of the samples; these tests can only be performed on relatively undisturbed samples containing little or no gravel. The two samples from borings B1 and B4 had test values of 7 ksf to 10 ksf, consistent with the medium-dense to dense conditions indicated by the SPT blow counts of seventeen and forty for these samples. The rest of the results ranged from 1.7 to 3.2 ksf; these samples had blow counts of two, five and twelve (soft, firm and stiff,) and were wet.

The moisture contents of the samples were generally moderate to low, even for the samples that were visually wet, consistent with well-consolidated conditions in well-graded, predominately inorganic soils;

the second-highest test result of 24% (boring B6 at 6ft depth, ) however, did contain some topsoil and fine roots. The samples from one foot depth in borings B6, B7 and B8 also contained minor fine roots; their moisture contents were 11%, 19% and 22%. The highest test result (boring B5 at 3ft, 25%,) was in wet sandy clay. Soils with moisture contents greater than forty percent tend to be poorly consolidated and weak, and will usually affect the seismic site classification, when they are present.

The particle size analyses and Atterberg Limits tests were performed on representative soil samples from the borings; these samples were all glacial till. The percent gravel, sand and fines (silt and clay) are summarized below, based on the USCS classification system. Note that the split-spoon sampling method which was used to collect the samples excludes particles that are medium gravel-size or larger. The gravel fraction may be under-represented; cobbles and boulders are also present in some of the soils but are not represented by the tests.

| Sample | B1-S3 | B2-S4 | B4-S4 | B5-S2 |
|---|---|---|---|---|
| Depth | 6 feet | 8 feet | 8 feet | 3 feet |
| USCS Class | SC-SM | SM | SM | CL |
| Gravel, % | 24 | 34 | 31 | 9 |
| Sand, % | 44 | 43 | 48 | 33 |
| Silt and Clay, % | 33 | 23 | 21 | 58 |

The Atterberg Limits tests indicates that, in the more clayey soil layers, the fine fraction of is lean clay or silty clay, which will tend to be somewhat sensitive to moisture changes, but which is unlikely to exhibit significant shrink-swell behavior; soils with a plasticity index of fifteen or higher are classified as potentially expansive. Many samples had a fine fraction which was classified as silt; in some layers the silt was cohesive and in others it was cohesionless, making it more susceptible to erosion, but also easier to dry when being conditioned for reuse as fill.

**2.2. Subsurface Profile and Summary of Soil Conditions**

Subsurface conditions encountered in the borings are described in the boring logs and are summarized in the drawing attached to this report. The borings and available information indicate that native soil is present at or near the surface in the proposed building area, while some shallow fill is present near the east building corner and along the line of the proposed retaining wall, where it was probably pushed over the edge of the bank during construction of the existing facility. In most areas the shallow, frost-affected soils were somewhat loose, but this loose zone extended to no more than thirty inches depth in the three borings in the existing parking area, which covers most of the proposed building location. It was about 42 inches deep in the lawn area east of the parking lot and about five feet deep at the west building corner. The soft zone was generally thicker along and near the line of the proposed retaining wall.

The native soils encountered in the borings consisted mostly of layered glacial till, composed of gravelly silty clayey sand, sandy clay, and gravelly silty sand. The bottom of the till tended to be shaley, with occasional cobbles and boulders of weathered shale, changing to weathered in-situ bedrock, with relatively hard rock encountered at depths of nine to fifteen feet. Within the till were some layers of pond- or stream-deposited soils, including sandy silty clay, sandy clay, sandy silt and silty clayey sand. The fill materials were similar in composition to the native soils and probably originated on-site.

The soils were generally softer along the line of the proposed retaining wall, on the slope descending toward the wetland. This area has been affected by soil creep as well as by frost, and minor fill is present. Minor topsoil was noted at five feet depth in boring B6, near the south end of the wall; this was about three feet below original grade, and the topsoil may have been mixed in by natural action, such as when a tree fell over.

Two cores were drilled in the bedrock, which was composed of gray siltstone with little fine sandstone, trace shale. Both the sandstone and the siltstone were hard, with sharp blows required to fracture short sections of the rock which were placed in a longitudinal core splitter.

Most of the soils were in a wet or very moist condition. Boring B3, near the center of the parking lot, was the only location were the soils were moist, with no very moist or wet zones; the top of weathered bedrock was also highest at this location. The weathered rock has relatively high hydraulic conductivity. In the fresh bedrock most of the joints are very fine and tight, with a few faults or fractured zones which probably act as the conduit for most of the deeper groundwater. Most of the project site is flat, with no storm drains, and groundwater is inferred to move from east to west, toward the wetland.



PHOTO 3. View facing northeast toward the existing Town Hall, with the drill rig in the vicinity of boring B2, near the center of the proposed building. Photo taken May 7, 2024.

## 3. EVALUATION

### 3.1. Subgrade Preparation

The investigation indicates that the subgrade conditions throughout the proposed building area are suitable for the use of shallow spread footing foundations and slabs-on-grade, subject to performing the required subgrade preparation operations, as described below. Conditions are also suitable for construction of the proposed segmental retaining wall. For the retaining wall, the requirements described below for subgrade preparation in foundation areas apply to the zone supporting the wall facing units, and requirements for the slab areas apply to the reinforced zone behind the wall, if a geogrid-reinforced wall is constructed.

Remove all existing pavement, utilities, topsoil, soft subsoil, stumps and large roots and similar items from the subgrade in all foundation and slab areas. Remove existing slabs and foundations, if encountered, in their entirety from below new foundation areas, and to at least twenty-four inches below bottom-of-slab in slab-on-grade areas, and as needed to prevent interference with the new construction. Remove uncontrolled fill in its entirety from below new foundation areas and from below slab-on-grade areas unless otherwise approved by the Engineer.

Excavate to the design subgrade elevation, or deeper if required to reach suitable subgrade soils, which shall be undisturbed native soils, free from topsoil, fine organics and root masses. The subgrade shall have a stiff/ medium-dense or harder consistency. Dewatering and draining of the excavations are expected to be required to some extent during and after excavation. Some over-excavation is expected to be required near the west building corner, to reach suitable soils.

In the proposed retaining wall area, wet conditions and soft to stiff clayey soils are expected to be present at the anticipated wall subgrade elevation. Unless the conditions are seasonally dry, the subgrade soils in this area will need to be allowed to drain and stiffen prior to placing the base course fill for the wall. A layer of woven drainage geotextile or of geogrid may be installed between the base course and the native soils to improve stability during construction. Some uncontrolled fill is also present in the retaining wall area; minor over-excavation may be required in some areas to reach suitable undisturbed subgrade soils.

Trim to the required subgrade elevation using excavation methods that minimize disturbance of the final soil surface. Compact the surface as needed to consolidate any soil that was loosened during excavation. Remove any pockets or small zones of unsuitable materials that are encountered, and replace them with controlled compacted fill. Contact the Engineer prior to performing any significant extra excavation. Where old foundations, stumps or boulders are removed, or where other over-excavation work is performed to prepare subgrade areas, the sides of the excavation shall be trimmed back to stable soil as each lift of backfill is placed. Where deficient soil is removed from below footing locations, the remediated area shall extend at least one foot out from the footing per foot of depth (1 to 1 splay.)

When excavating weathered bedrock, fracture and loosen the rock to a depth of approximately six to twelve inches below the design subgrade elevation, to permit fine-grading and to eliminate hard points in contact with the bottoms of footings or slabs. Thoroughly compact the fractured rock. If hard bedrock is present, over-excavate the rock by six to twelve inches and replace it with compacted granular site-borrow soil or Structural Fill, to act as a cushioning layer and as a leveling course for concrete forms.

If fine-grained native soil is present at the bearing elevation, a layer up to four inches thick of Structural Fill or equivalent site-borrow soil may be placed in the footing bottom to protect the soil surface, after properly preparing the surface to a level and stable condition. This layer shall be thoroughly compacted with a vibratory plate tamper or roller, and its surface shall not extend above the design bearing elevation. Footings may bear directly on the prepared soil or rock subgrade, or on controlled compacted fill placed over the subgrade. Footing bearing surfaces shall be free from frost, mud and loose soil or standing water, when concrete is placed. Rock surfaces should be thoroughly moistened prior to placing concrete.

**3.2. Excavation**

The borings indicate that the existing fill and native soils may be excavated using conventional heavy equipment, such as tracked excavators and bulldozers. Backhoes and mini-excavators should be suitable for the excavation of shallow trenches. Little or no excavation of hard rock is expected within the building areas, but some weathered rock may be encountered; it is expected that a large excavator or bulldozer will be able to remove the weathered rock, but breaking with a hydraulic hoe-ram may be required if a hard layer is encountered. Refer to the Subgrade Preparation section of this report for additional requirements.

The investigation indicates that the soils which will be encountered in the building area excavations are likely to predominately be OSHA Type A, requiring a minimum slope of 0.75-to-1 in shallow excavations, with benching permitted. Some looser soils are present in the proposed retaining wall area, and 1:1 or 1.5:1 slopes may be required there. In most locations the groundwater will need to drain from the soils prior to final trimming of the cut. Soil types and excavation requirements must be confirmed by a qualified representative of the Contractor during construction.

No shoring of excavations should be required, as there appears to be sufficient clearance around the anticipated work areas to allow the use of conventional excavation slopes. Trench boxes or other temporary shoring will be required for work in deep trenches and may be required when excavating trenches in wet areas, regardless of depth. The design of any necessary shoring or other support-of-excavation is the responsibility of the Contractor and is not included in this report.

Groundwater seepage rates in the building and wall excavations are expected to be slow, but will likely be persistent, at least during wet seasons. There may also be some initial short-term drainage of greater volume from zones of perched water. Groundwater seepage and stormwater should be removed promptly from the excavations, and the groundwater elevation should be maintained at a depth of at least one foot below the soil surface in active construction areas. When dewatering flooded excavations, the water level should be drawn down at a controlled rate to minimize sloughing, allowing the water to drain from the soil in the sides of the excavation. Gravity drainage and conventional shallow sump pits installed in the excavations should be adequate for the control of groundwater seepage during construction.

**3.3. Fill Materials and CLSM**

All fill placed below foundations and slabs shall consist of Structural Fill or suitable site-borrow soil, as described below, or shall be other imported fill of a quality at least equal to that of the site-borrow fill.

Some of the soils excavated from the site are expected to be of suitable quality for re-use as fill and backfill for foundations, slabs and pavement areas. Exclude topsoil and wet, organic or otherwise deficient soils from the borrow fill, which should be blended as much as practical, to produce a uniformly compactible product. The site-borrow soils will likely require some require drying prior to compaction. Boulders and large cobbles must be removed from the borrow fill. Clumps of clayey soil should be excluded from the fill, but if included they must be thoroughly broken up and mixed in. Weathered rock and hard rock excavated from the site may also be used as fill.

Structural Fill, if imported for use below foundations and slabs, shall be good-quality bank-run sand and gravel or crushed stone, and should be a well-graded product complying with the gradation limits below. Structural Fill may also be used as foundation backfill. Structure Fill HD (Heavy Duty) should be used in areas to be protected from heavy construction traffic and where subgrade stabilization is needed. Structure Fill HD and NFS (non-frost susceptible) provide enhanced drainage; they are suitable for use as fill for frost-protected shallow foundations and for placement during winter conditions.

| Structural Fill Materials | | | | | |
|---|---|---|---|---|---|
| Sieve Size | | Percent Passing by Weight | | | |
| Inch | mm | Structure Fill | Fine Structure Fill | Structure Fill NFS | Structure Fill HD |
| 4″ | 100 | 100 | 100 | 100 | 100 |
| 1½″ | 37.5 | 70-100 | 100 | 70-100 | 50-95 |
| #4 | 4.75 | 30-80 | 80-100 | 30-80 | 20-50 |
| #40 | 0.425 | 5-45 | 15-45 | 5-40 | 5-25 |
| #200 | 0.075 | 0-25 | 0-20 | 0-10 | 0-8 |
| Plasticity Index | | 7 max. | 7 max. | Non-plastic | Non-plastic |

All fill materials shall be composed of sound, durable particles, shall be free from frost or snow, garbage, construction debris or other deleterious material, and shall be substantially free from organic matter and roots. Imported fill materials shall be obtained only from licensed or otherwise approved sources. Recycled crushed concrete and masonry may be acceptable for some applications above the water table, subject to approval by the Designer of Record. Fill shall not be placed over frozen or unstable soil, unless approved by the Engineer.

CLSM (Controlled Low-Strength Material, aka flowable fill,) may be used under footings and foundations when specifically approved by the Engineer, and may also be used to backfill trenches or other excavations, typically where rapid fill placement is required, fill areas are narrow, or the use of conventional compaction methods is not practical. For support of footings, a CLSM mix consisting of sand, cement and water, with a 56-day compressive strength of 75 to 200 psi, is appropriate. CLSM may produce high fluid pressures during placement, and caution must be used for placements against foundation walls, near unbraced cuts, etc. Pipes or tanks can also float if not properly restrained during placement. CLSM should not be placed against unprotected aluminum; CLSM containing flyash should not be used in contact with cast iron or ductile iron. Hardened CLSM masses may also adversely affect groundwater flow, possibly causing erosion under or along the CLSM, particularly in sloping trenches.

**Other Fill Materials:**

- Crushed stone base course for slabs-on-grade should consist of ASTM C33 #56 or #57 stone (⅜- to ¾-inch size,) or as required by the slab system design.
- Crushed stone or gravel for footing drains should consist of ASTM C33 #5, #56 or #57 stone (¾-inch or ⅜-¾-inch size.)
- Well-graded granular subbase material (NYSDOT Item 733-04 'Item 4' or similar) should be used under sidewalks and exterior slabs.

**3.4. Fill Placement and Compaction**

Soil surfaces, including the surface of the subgrade and of previously-placed fill materials, shall be prepared to a stiff and essentially unyielding condition prior to placing each new lift of fill. Bedrock surfaces to receive fill shall be free from voids or loose areas and the rock surface shall be free from large loose pieces of stone. Use mid-size equipment to compact the site-borrow fill or similar materials. Vibratory trench rollers, and single-drum soil rollers with a nominal size of three to five tons, should be appropriate for the observed site conditions. Larger rollers may be used when compacting well-graded granular fill over essentially unyielding surfaces. In areas with limited access, vibratory plate tampers or jumping-jack tampers may be used. Avoid over-compacting the shallow soils in landscaped areas.

Fill shall be placed in controlled lifts, with each lift compacted to the required density at a moisture content close to optimum moisture, as determined by ASTM D1557. When the moisture content of fill which will support footings or slabs is within two percent of optimum, fill may be placed in lifts with compacted thicknesses of up to eight inches. If the moisture content is two to 2.5 percent from optimum, reduce the maximum thickness to six inches, and if it is more than 2.5 percent from optimum, discontinue compaction. In roadway, embankment and other non-structural locations, fill may be placed in lifts with a compacted thickness of up to twelve inches when the moisture content of the fill is within two percent of optimum, and up to eight inches thick when it is two to 2.5 percent from optimum. Use a reduced lift thickness if required to obtain the specified percent compaction and when using small compaction equipment.

When placing fill during winter weather, use Structure Fill NFS or HD, or similar fill material containing less than ten percent non-plastic fines. Fill produced from natural sand and gravel is preferable to crushed stone or concrete fill for winter work, for ease of compaction. Compact the fill with a maximum lift thickness of six inches and do not compact fill whose moisture content is more than two percent above or below optimum. Do not place or compact fill when the air temperature is less than 25°F. Do not place frozen fill materials.

Where fill will be placed against slopes, bench the fill into the slope to create a stair-step interface, for improved stability and groundwater control. Lightly scarify the surface of the existing soil prior to placing the fill, and key the fill into the subgrade at the toe of the slope. When the fill is more than five feet high against a slope of twenty percent or more, the key should be at least two feet deep and ten feet wide.

Backfill placed against foundation walls should be compacted with trench rollers or with similar equipment which will not produce damaging stresses on the wall. Place backfill equally on opposite sides of the

foundation unless otherwise indicated by the specifications or drawings. Foundation walls acting as retaining walls should be braced (i.e. by installation of the floor framing) before placing backfill, unless otherwise indicated on the drawings or approved by the Engineer.

Open-graded stone base course material for slabs-on-grade should be graded level and seated with one or more compaction passes, to help resist displacement during slab area preparation and concrete placement.

Compact each lift of fill supporting slabs or foundations with at least six one-way compaction passes, even if passing test results are obtained with fewer passes. Each compaction pass shall be made at a slow walking speed (less than four feet per second,) and the equipment shall pass completely over all areas of the fill. Fill materials shall be compacted to at least the following percentage of the ASTM D1557 maximum dry density. For coarse-graded fill materials with more than thirty percent retained on the ¾-inch sieve, the ASTM D4253 Maximum Index Density test may be substituted for the D1557 test.

| Location | Percent Compaction |
|---|---|
| Below Footings, Foundations, Slabs and Structures | 95% minimum |
| Embankment Fill for Paved Areas | 92% minimum |
| Exterior Foundation Backfill in Landscaped Areas | 90% minimum |

**3.5. Testing**

The subgrade shall be inspected to verify that it has been prepared in conformance with the requirements of this report, prior to placing fill or foundations. Recommended test procedures and frequencies are provided below.

**PROOF-ROLLING:** Proof-rolling of the prepared subgrade soil is not required, but may be performed to determine the limits of a soft area. Use an appropriately–sized vehicle, to avoid damaging wet and/or fine-grained, but otherwise acceptable soils. Observe the effects of the moving vehicle; if the soil exhibits excessive deflection, rutting or cracking, additional excavation or drying of the subgrade may be required.

**BEARING CAPACITY:** The prepared subgrade surface throughout the foundation and slab areas and the retaining area shall be probed thoroughly to check for soft spots. The foundation subgrade shall be in a dense and unyielding condition, substantially free from soft areas and/or loose material. If these conditions are not encountered at the bearing elevation, testing shall be performed with a Static Cone Penetrometer or equivalent device in foundation bearing areas. If the design bearing capacity is not indicated within three inches of the bearing surface, the soil conditions shall be corrected and/or, if approved by the Engineer, the footing depth may be increased to reach acceptable soil. The slab subgrade areas shall be densely consolidated and sufficiently stiff to prevent rutting or displacement during slab base course and concrete placement operations. Where weathered or fractured rock is present at the bearing elevation, it shall be visually inspected to verify that it is generally level and free from accumulations of loose material, and that in areas where it is fractured, the fractured mass is in a dense and stable condition, free from large open voids.

**COMPACTION TESTING:** Compaction testing shall be performed for each lift of fill supporting foundations, with testing performed while the work is in progress. Testing is also recommended for the fill

supporting slabs or pavement, for exterior backfill and for fill placed in embankments. Compaction testing is recommended for all retaining wall construction, with requirements to be determined by the wall designer. Compaction tests of fill and backfill supporting foundations and slabs should be performed in at least one location per 50 linear feet or per 1000 square feet of fill surface, per lift. At least one test per 100 linear feet or per 2500 square feet should be performed for each lift of fill in embankment, roadway and other non-structural areas. Compaction tests should be performed with a nuclear moisture-density gauge, per ASTM Test Method D6938, unless otherwise approved. Required percent compaction values are provided above.

**CLSM:** When flowable fill is used to support footings or foundations, at least one set of three 6x12-inch test cylinders shall be cast from each day's placement, per ASTM D4832. Test the cylinders for unit weight and for compliance with the specified strength requirements. Cast additional cylinders if early tests are needed.

**3.6. Geosynthetic Materials**

Geosynthetic materials are expected to be used for reinforcement and drainage applications at the site on an as-needed basis, or where required by Code, such as for footing drains. Geosynthetic materials shall be installed over a smooth and evenly shaped subgrade, to avoid 'tenting' of the material over voids or high points. The geosynthetic shall be installed substantially free from wrinkles, and fill material shall be placed and spread in a manner which pushes out the wrinkles, but which does not otherwise displace the geosynthetic material. Vehicles shall not drive on the exposed geosynthetics. Woven reinforcement geotextiles will usually act as an infiltration barrier when installed in a continuous horizontal layer, and non-woven separation geotextile may also work as a barrier; this may or may not be desirable, depending on the installation location and conditions, and should be considered when specifying or using these products. The following material types are recommended for use in the anticipated construction conditions.

Drainage Separation: For footing drains and similar applications, a woven drainage geotextile with at least 4% open area, with an apparent opening size of 0.21mm (#70) or smaller, should be installed around the open-graded drainage stone. Non-woven geotextiles are not recommended for use in this application, due to the presence of fine particles in the native soil that will tend to clog the fabric. If stone drains are installed in areas of fine sand or cohesionless silt, provide a zone of clean sand at least three inches thick between the geotextile and the soil.

Subgrade Reinforcement: Typically, a woven reinforcing geotextile with a grab tensile strength of at least 200 pounds should be used where needed to improve the stability of soft subgrade soils. Geogrids should be used for non-horizontal applications, such as on sloping roadways. High-strength woven drainage geotextile or geogrid should be used where free vertical drainage is desired. A minimum of twelve inches of granular fill cover is typically required to fully mobilize the strength of the reinforcing geosynthetic.

Subgrade Separation: Where fines from the subgrade may infiltrate into an overlying granular layer, and strengthening of the subgrade and some vertical drainage is desirable, a non-woven geotextile should be installed between the two materials. A four-ounce nominal weight fabric is suitable for light- to moderate-duty applications; heavier fabric should be used where it will be subjected to heavy traffic, especially if it is placed in contact with very coarse-graded materials.

## 4. DESIGN VALUES AND RECOMMENDATIONS

Soil engineering properties and recommendations for design are provided in this section; additional important design considerations are also discussed in the other sections of this report. The design values assume that the building will be supported by a conventional spread footing foundation with slab-on-grade floor, as described in the previous sections, and will be provided with proper drainage. Additional design values for the proposed segmental retaining wall are also provided below.

### 4.1. Bearing Capacity and Soil Pressure - Building

| Allowable Bearing Capacity, $q_a$ | |
|---|---|
| Footings bearing at least 42 inches below finished grade, with a minimum width of 12 inches | 3000 psf |
| Footings bearing at least 24 inches below finished grade, with a minimum width of 24 inches | 3000 psf |
| Minor Footings bearing at least 12 inches below finished grade, with a minimum width of 12 inches | 1500 psf |

| Soil Properties | Native Soils | Weathered Bedrock |
|---|---|---|
| Soil Moist Density, $\gamma$, lbs/cu ft | 130 | 150 |
| Effective Internal Angle of Friction, $\emptyset$ | 32º | 36º |
| Coefficient of Active Earth Pressure, $k_a$ | 0.31 | 0.26 |
| Coefficient of Passive Earth Pressure, $k_p$ | 3.25 | 3.85 |
| Coefficient of At-Rest Earth Pressure, $k_o$ | 0.47 | 0.41 |
| Lateral Bearing Capacity (psf per ft below grade) | 210 | 290 |
| Coefficient of Friction (vs. concrete) | 0.35 rough<br>0.30 formed | 0.55 rough<br>0.40 formed |
| Modulus of Subgrade Reaction, k, psi per inch | 225 | 500 |

Footings subject to frost shall bear at least 42 inches below finished grade, or shall be otherwise protected from frost. Footings not exposed to frost, or bearing on non-frost susceptible subgrade materials, shall bear at least one foot below finished grade. Bearing elevations of footings shall be established such that a line drawn between the bottoms of two adjacent footings is not steeper than 30 degrees between the closest points on the footings. (Slope of 1 vertical to 1.75 horizontal.)

Settlement of the building foundation elements, over the time span from the completion of foundation construction to the completion and normal occupancy of the building, is expected to be one half inch or less in the well-consolidated soils at this site. The settlement is expected to reach completion moderately quickly, with little or no additional long-term settlement of the native soils or controlled fills, when prepared in conformance with the recommendations of this report. Up to one inch of settlement and ¾-inch of differential settlement should be assumed for design purposes. No measurable settlement is expected where foundations bear on rock. If fill is placed below footings, an additional quarter inch of settlement should be expected per five feet of fill thickness.

If encountered above the design bearing depth, undisturbed bedrock and rock that has been fractured by excavation are non-frost-susceptible subgrade materials, and frost-protected shallow footings, as specified in ASCE 32, may bear on rock at depths as shallow as twelve inches when the required vertical foundation wall insulation is also provided. Where footing depths are reduced, pinning to rock may be required if the footing will be subjected to significant uplift or lateral forces. These installation conditions must be reviewed and approved on a case-by-case basis.

**4.2. Bearing Capacity and Soil Pressure – Retaining Wall**

An allowable bearing capacity of 2000 psf is recommended for design of the proposed segmental retaining wall. This value uses a safety factor of two, and is based on distribution of the wall load to the native soils by a (minimum) 36-inch wide granular base pad at a depth of 18 inches below finished grade. The properties of the retained soils, the deeper soils and the weathered bedrock should be taken from the values cited for Native Soils in the table above. For analysis of the foundation soils supporting the wall, a moist density of 130 pcf and an internal friction angle of 30º should be used for the soils to a depth of five feet below grade.

**4.3. Control of Groundwater and Soil Gases**

Minor groundwater seepage should be expected in excavations and below-grade areas during and after construction. It is understood that the building will not have a basement and that the first-floor slab will be entirely above grade. Adequate drainage must be provided to maintain the groundwater at an elevation below the slab base course; footing drains may be helpful, but are not required by Code for the above-grade slab conditions, and the site drainage may be used to provide the required groundwater control near the building. The proposed segmental retaining wall should be constructed on a granular base course, with a drainage zone provided behind the face of the wall. The retained soil should be allowed to drain freely, either through the use of clean granular fill behind the wall or by installing an underdrain at the rear toe of the wall backfill zone. Construction dewatering is discussed elsewhere in this report. For the completed construction, the elevations shown on the plans indicate that groundwater drainage conveyed from the vicinity of both the building and the retaining wall should be able to discharge by gravity.

Soil gases that may impact the structure are water vapor and radon. The interior spaces can be protected from these gases by providing conventional moisture protection of the floor slabs, and by sealing all slab and wall-to-slab joints, concrete cracks, pipe penetrations and other openings, as well as by designing against negative-pressure conditions caused by excessive ventilation and/or by the operation of boilers or other equipment. If an open-graded base course is used under the slab, a passive or powered vapor mitigation system using small-diameter PVC pipes can be included, or can be added retroactively if needed to vent excess soil gases to the atmosphere. The potential for these gases to adversely impact the use of the building is estimated to be low, if these practices are used, and normal interior ventilation is provided.

**4.4. Seismic and Expansive Properties**

**Seismic Design Values:** The Seismic Site Class and Seismic Design Category for the proposed construction were determined per section 1613 of the New York State Building Code and ASCE 7-16. Seismic values for the site were obtained from the current database maintained by the Applied Technology Council, Redwood City, Cal., and are consistent with the published maps in the Building Code. The design values are provided in the table below.

The Seismic Site Class is based on the conditions in the upper 100 feet of the subsurface. In the building area there is approximately twelve feet of soil and weathered rock with an average SPT N-value of 43 (dense,) over sedimentary bedrock. In the ten-foot core from boring B1 the rock was fresh and moderately weathered; in the five-foot core from boring B5, the rock was slightly weathered and highly fractured, but was changing to fresh, moderately-fractured bedrock toward the bottom of the core. This bedrock is estimated to have a seismic shear wave velocity greater than 2500 ft/sec, based on information from the USGS database and from studies of similar bedrock. The bedrock properties govern the seismic site classification, which is Class B, Rock.

| | | |
|---|---|---|
| Occupancy Category | IV – Essential Facilities | |
| **Seismic Site Class** | B – Rock | |
| **IBC Seismic Design Category** | **SDC - A** | |
| Maximum Acceleration, $MCE_R$ | 0.2 sec $S_S$<br>1.0 sec $S_1$ | 0.216 g<br>0.055 g |
| Site-modified Spectral Acceleration Value | 0.2 sec $S_{MS}$<br>1.0 sec $S_{M1}$ | 0.195 g<br>0.044 g |
| Numeric Design Value | 0.2 sec $S_{DS}$<br>1.0 sec $S_{D1}$ | 0.130 g<br>0.030 g |
| Peak Ground Acceleration, PGA | $MCE_G$ | 0.124 g |
| Factored uniform-hazard spectral acceleration<br>Probability of exceedance 2% in 50 years | 0.2 sec $S_S$UH<br>1.0 sec $S_1$UH | 0.229 g<br>0.060 g |

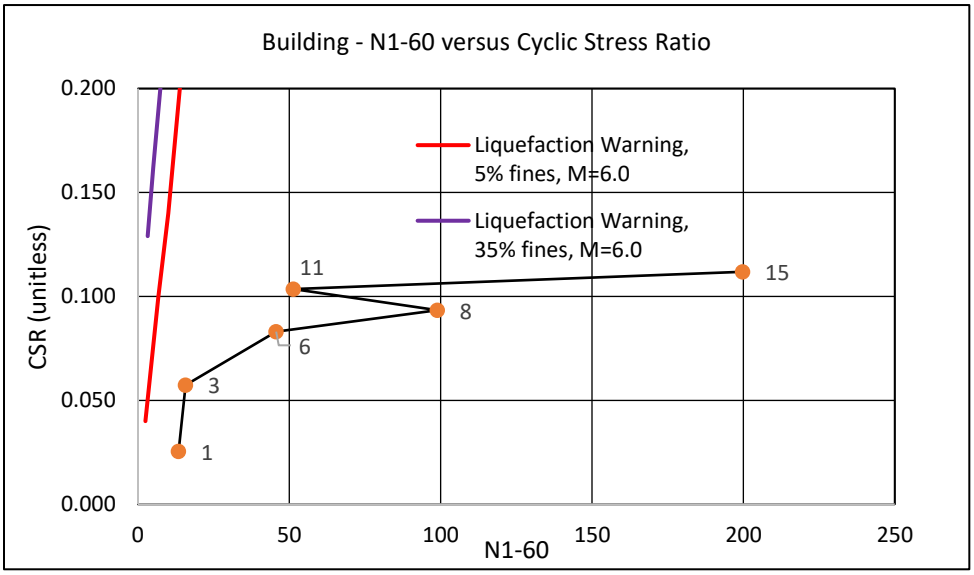
The seismic design values are based on the "risk adjusted maximum probable earthquake." These are not the maximum values that *could* occur, they are values that are not likely to be exceeded during the service life of a typical structure.

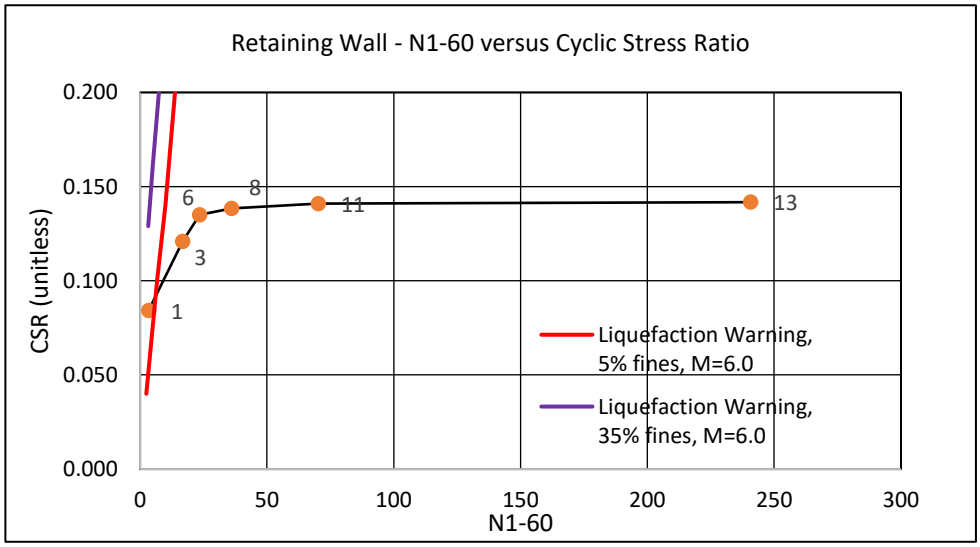
**Liquefaction Potential and Slope Stability:** The soils encountered in the investigation have very low liquefaction susceptibility. Liquefaction is typically associated with thick deposits of loose poorly-graded sand situated below the water table, and may also occur in loose, poorly-graded gravel or cohesionless silt. A similar phenomenon, cyclic softening, can occur in saturated soft clays. Those soils are also prone to shifting or spreading during seismic events when they are situated near a slope, even if the slope is gentle. The soils encountered in the borings have textures, drainage conditions, locations and/or sufficient consolidation (density) to resist liquefaction or unusual movement during the design seismic event. No special mitigation measures are required.

The subsurface data was evaluated to confirm the above qualitative assessment, using the methods presented in NYSDOT Geotechnical Design Procedure GDP-9, 'Liquefaction Potential of Cohesionless

Soils,' which predicts a soil's potential to liquefy during a seismic event, based on the soil's texture and depth, the SPT blow counts and the Design Earthquake magnitude. The 0.2 sec $S_{DS}$ value noted above was used as the seismic acceleration value. The lowest blow count (N) values in the proposed building and retaining wall areas were taken at each depth and their N1-60 values were calculated per the GDP-9 procedure, which modifies the N value based on the testing conditions and the depth. The minimum N1-60 values for each depth were then plotted versus the cyclic stress ratio (CSR, indicating seismic intensity,) as shown in the graphs below. The points are labeled with their depths and they are connected in order by the line.

Values plotting to the right of the red line indicate that the soil is sufficiently dense that it is unlikely to liquefy during the design-magnitude earthquake, even if it has the most liquefaction-susceptible texture, one with less than five percent silt and clay. Soils containing 35% silt and clay are unlikely to liquefy even if they are slightly less dense, as indicated by the purple line. In the building area all of the minimum test results plotted in the 'liquefaction unlikely' region of the graph. In the retaining wall area the only value plotting in the liquefaction-susceptible zone was from one foot depth, in loose fill which will be remediated by the construction activity. The results of the numerical analysis support the classification of the soils as unlikely to experience liquefaction.



The proposed retaining wall will be built on an existing slope. This may require an increased depth of embedment for the wall base in order to meet global stability requirements, but does not present any special seismic concerns. Properly designed and constructed segmental retaining walls will typically experience some deformation during a major seismic event, but are unlikely to fail, unless the deformation ruptures utilities in the retained soil.

**Expansive Soils and Frost Heave:** The soils encountered in the investigation have a very low potential for expansion due to shrinking and swelling resulting from moisture changes. This behavior is typically associated with high-plasticity silt and clay soils. Physical testing and qualitative examination indicate that the properties of the in-situ soils do not meet the criteria for potentially expansive soils as defined in section 1803.5.3 of the Code. No mitigation measures are required. The on-site soils are moderately to highly susceptible to frost heave. Frost heave can be minimized by providing good drainage and by thoroughly compacting the soil. Well-graded granular fill should be used in areas where frost heave could result in damage.

## 5. NOTES AND LIMITATIONS

Please see the attached pages for additional information. Subsurface conditions encountered during construction shall be compared to the soil boring logs and this report; any significant variations from anticipated conditions must be evaluated for their effect on the design. This report summarizes the results of a limited investigation and does not purport to predict every variation in subsurface conditions. Elevations, slopes, contours, project layout and similar or related data provided in this report were interpreted from the drawings, from field data or from other information which was provided, unless otherwise noted.

This geotechnical investigation was conducted to evaluate the engineering properties of the soils at the site, to aid in the design and construction of the proposed work. The investigation did not include evaluation of the potential effects of the proposed construction on other properties, nor did it include inspection of, or sampling for, items of environmental concern such as the presence of soil contaminants or of regulated wetlands, and did not include review of local zoning regulations, codes, floodplain boundaries or similar matters, unless specifically referenced in the report. This investigation was conducted solely for the use of the Client, the Client's Project Designers and Agents and the Authorities Having Jurisdiction; this report should not be used by others, nor for any use other than its stated purpose, without contacting the Engineer. Any such use is solely at the user's risk.




Prepared by Kevin L. Patton, P.E.

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**Soil Technical Notes:**
Soil Classifications, Descriptions and Properties

**The USCS** (Unified Soil Classification System) was used to classify the soils in this report. The USCS is described in ASTM D2487 (laboratory test method) and D2488 (visual-manual method.) The USCS classification gives a 'Group Symbol' and 'Group Name' based on particle size distribution (gradation,) clay properties (Atterberg Limits) and basic composition (mineral or organic.)

**USCS Soil Classes**

Soils with less than 5% passing the #200 sieve:
GW, GP, SW, SP – Well-graded gravel, Poorly-graded gravel, Well-graded sand, Poorly-graded sand.
Soils with 12% to 50% passing the #200 sieve:
GC, GM, GC-GM, SC, SM, SC-SM – Clayey gravel, Silty gravel, Silty clayey gravel, Clayey sand, Silty sand, Silty clayey sand.
Soils with 5% to 12% passing the #200 sieve use a dual symbol, such as SW-SC (Clayey well-graded sand.)
Soils with more than 50% passing the #200 sieve:
CL-ML, ML, CL, MH, CH, OL, OH – Silty clay, Silt, Lean clay, Elastic silt, Fat clay, Organic silt, Organic clay.
Highly organic soils:
PT – Peat.

The soil group name is modified with the term 'with sand' or 'with gravel' added if the soil contains more than 15% of these materials; clays and silts with 30% or more plus-#200 material are described as 'sandy' or 'gravelly' (whichever is predominate.) Examples – GM, Silty gravel with sand; CL, Gravelly lean clay.

**Particle size**

| | |
|---|---|
| >12" (300mm) | Boulders |
| 12" to 3" (300-75mm) | Cobbles |
| 3" to #4 (75-4.75mm) | Gravel |
| #4 to #200 (4.75-0.075mm) | Sand |
| <#200 (0.075mm) | Silt & Clay |

**Organic Soils**

Highly organic soils such as peat are visually classified. Partly organic soils, with a mix of organic and mineral matter, are classified visually and by Atterberg Limits tests.

**Moisture Content**

Moisture is visually estimated and samples are usually tested. Soil moisture capacity varies with texture and compaction.

Typical examples:
GW, moist at 3%, saturated at 9%
SP, moist at 6%, saturated at 20%.
CL, moist at 12%, saturated at 33%.

**Fine- and Coarse-grained Soils**

The USCS classification applies to the material smaller than the 3-inch sieve.

'Fine-Grained Soils' (silts and clays) have more than 50% passing the #200 sieve and are classified by their Atterberg Limits.

'Coarse-Grained Soils' (sands and gravels) have less than 50% passing the #200 sieve. When more than 50% of the plus-200 material is retained on the #4 sieve the general soil type is gravel, and if more than 50% is finer than the #4 sieve, it is sand.

Clean coarse-grained soils are classified as well-graded (Classes GW, SW) or poorly-graded (GP, SP.) Well-graded soils have a wider range of sizes and are typically more stable. Poorly-graded soils are usually more permeable.

**Atterberg Limits**

Test is performed on the clay, silt and fine sand fraction of the soil:
Liquid Limit (LL) – moisture content (%) at which soil becomes very soft.
Plastic Limit (PL) – moisture content at which soil crumbles.
Plasticity Index (PI) = LL minus PL

Higher PI values may indicate reduced permeability and increased drying shrinkage.

LL > 50 indicates soil with a higher potential to shrink and swell due to changing moisture content.

Silts have lower PI values, and behave like very fine sand; most silts also contain some clay. Behavior of clays is partly controlled by electrochemical forces and varies among the several clay minerals.

**Color**

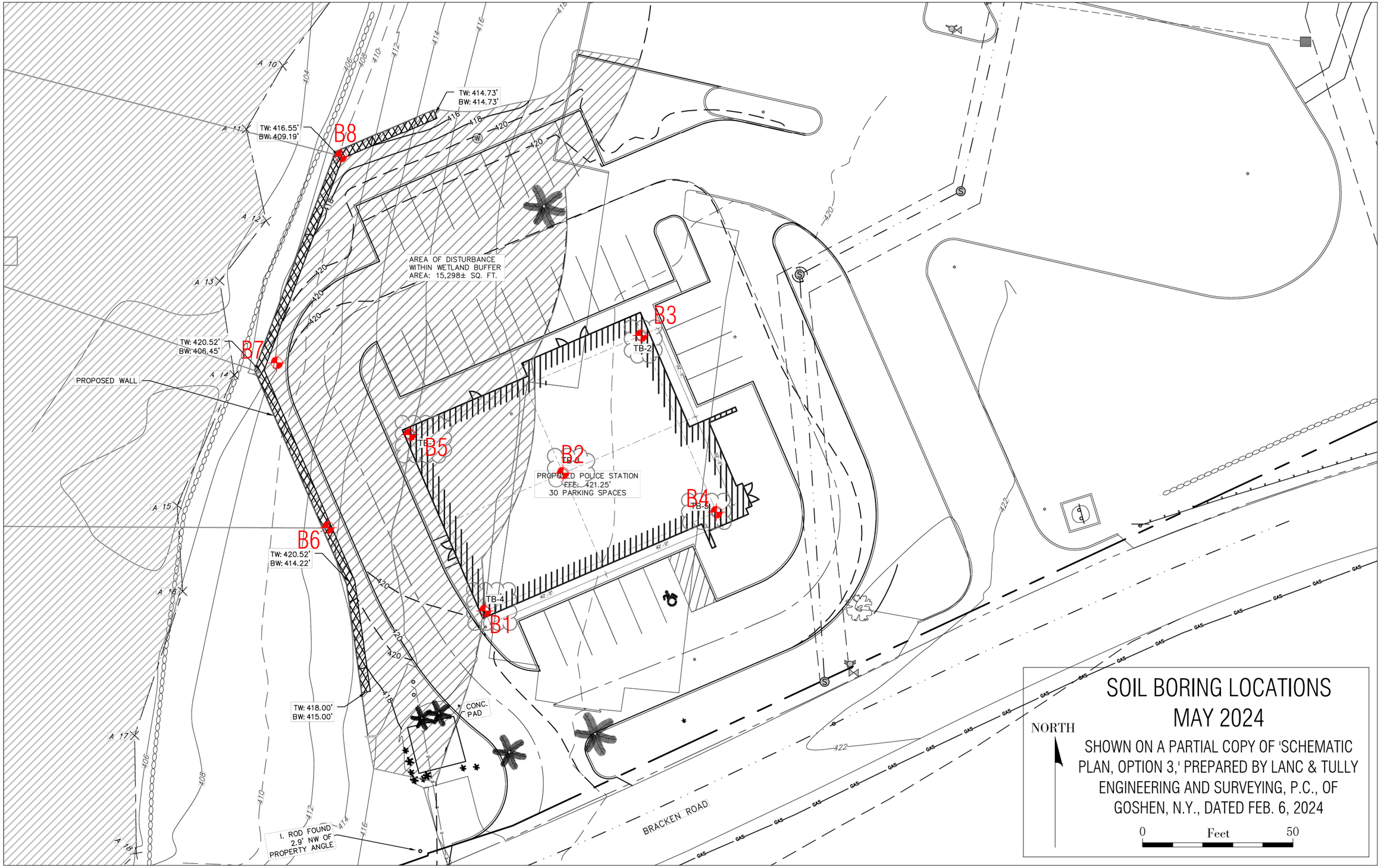
Soil color sometimes indicates groundwater conditions, with subdued colors below the water table and mottled (mixed) colors in the zone of seasonal water table fluctuation. Color changes tend to be more prominent in fine-grained soils.

**Relative Quantities**

Estimated percentages in descriptions:
<5% - Trace
5-10% - Traces
10-25% - Little
25-35% - Some
'And' - Approx. equal amounts
'Few' - <10% (cobbles and boulders)

**USDA Soil Classification**

USDA classifications are based on the relative amounts of sand, silt and clay in the soil fraction passing the #10 (2mm) sieve. 'Gravelly' indicates more than 15% of #10 to 3" size. 'Channery' indicates 15 to 35% thin flat pieces up to 6" long.




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NEW POLICE STATION - TOWN OF MONTGOMERY, N.Y.

110 BRACKEN ROAD

SOIL BORING LOCATIONS

PROJECT NUMBER
24203

| REV. | DATE | BY |
|---|---|---|
| 0 | 6/13/2024 | KLP |

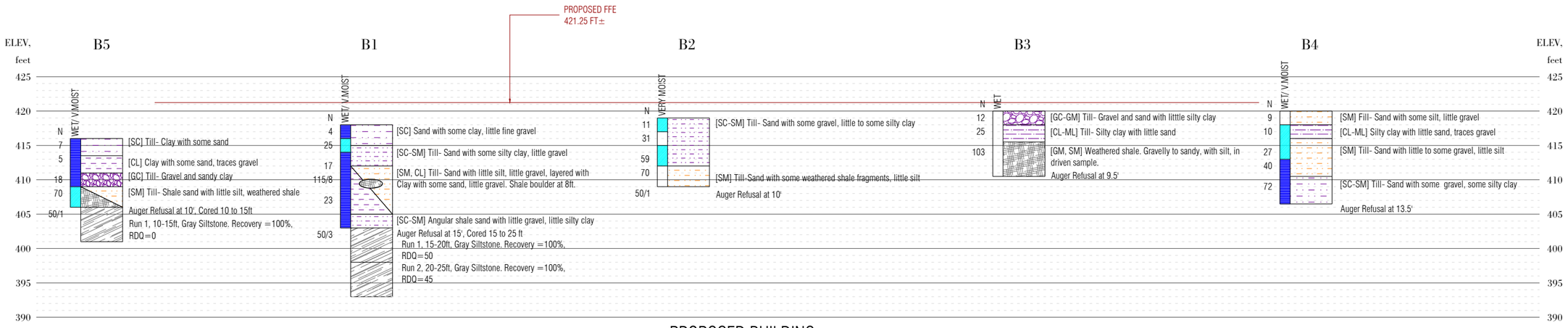
# GENERALIZED SUBSURFACE PROFILE

NO HORIZONTAL SCALE.
USCS SOIL CLASSIFICATIONS ARE IN BRACKETS.

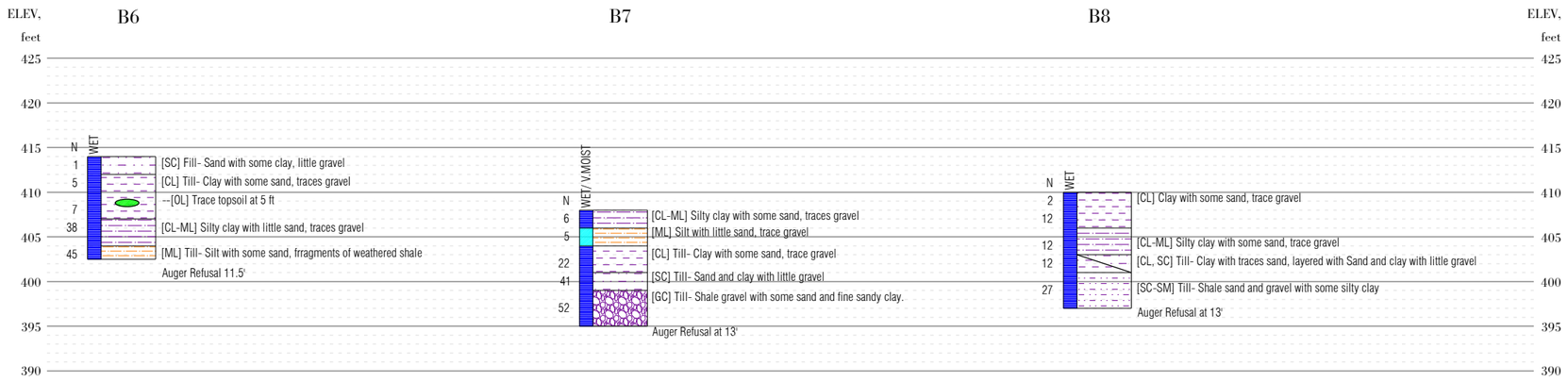
VERY MOIST
WET

IN GENERAL, RED PATTERNS INDICATE RELATIVELY CLEAN SANDY OR GRAVELLY SOILS, PURPLE PATTERNS INDICATE SOILS WITH SIGNIFICANT CLAY CONTENT AND ORANGE PATTERNS INDICATE SOILS WITH A SIGNIFICANT SILT CONTENT.

THESE SECTIONS ARE GENERALIZED REPRESENTATIONS OF THE SUBSURFACE PROFILE, BASED ON THE SUBSURFACE EXPLORATION DATA, OBSERVATIONS, RESEARCH, AND OTHER RELEVANT INFORMATION. THE SOILS INFORMATION PRESENTED HEREIN SHOULD BE INTERPRETED IN CONJUNCTION WITH THE INFORMATION FROM THE BORING LOGS AND THE GEOTECHNICAL INVESTIGATION REPORT. SITE CONDITIONS MAY DIFFER FROM THOSE ENCOUNTERED AT THE BORING LOCATIONS.




PROPOSED BUILDING




PROPOSED RETAINING WALL


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NEW POLICE STATION - TOWN OF MONTGOMERY, N.Y.

110 BRACKEN ROAD

SUBSURFACE PROFILE

PROJECT NUMBER
24203

| REV. | DATE | BY |
|---|---|---|
| 0 | 6/13/2024 | KLP |

**KEVIN L. PATTON, P.E.**
**36 PATTON ROAD**
**NEWBURGH, NY 12550**
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| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/7/2024 | Project No.: | 24203 |
| WEATHER: | Clear, 65° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Building Area, South Corner | **BORING NO.** | **B1** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 418 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 8 | SC | 2 | **3** | **1** | 3 | Wet | Sand with some clay, little fine gravel | |
| | | | | | | | | | | Yellowish brown, faint mottling | |
| 2-4 | **S2** | SS | 19 | SC, | 5 | **7** | **18** | 21 | Very Moist | Same, to Sand with some silty clay, little | |
| | | | | SC-SM | | | | | | gravel. Yellowish brown to moderate yellowish | |
| 5 | | | | | | | | | | brown. | |
| 5-7 | **S3** | SS | 24 | SC-SM, | 10 | **11** | **6** | 10 | Wet | Till: Sand w/little silty clay to Sand and silt w/ | Shale fragments. |
| | | | | SM | | | | | | some gravel. Moderate yellowish brown | PEN 7ksf |
| 7-9 | **S4** | SS | 9 | GM | 25 | **65** | **50/2** | | Moist | Weathered shale with seams of silty sand | |
| | | | | | | | | | | Grey with brown | |
| 10 | | | | | | | | | | | |
| 10-12 | **S5** | SS | 24 | SM, | 14 | **11** | **12** | 9 | Wet | Till: Moderate yellowish brown sand with little | |
| | | | | CL | | | | | | silt, little gravel layered with Yellowish brown | |
| | | | | | | | | | | clay with some sand, little gravel. | |
| | | | | | | | | | | | |
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| 15 | **S6** | SS | 3 | SC-SM | 50/3 | | | | Wet | Angular shale sand with little gravel, little silty | Auger refusal 15' |
| 15-20 | **R1** | C | 100% | Rock | | | | | | clay. Grey and yellowish brown, slight | Cored 15-25' |
| | | C | | | | | | | | mottling. | |
| | | C | | | | | | | | CORE RUN 1 (15-20 ft) Grey siltstone with | |
| 20 | | C | | | | | | | | some fine sandstone, trace shale. RQD = 50. | |
| 20-22 | **R2** | C | 100% | Rock | | | | | | CORE RUN 2 (20-25 ft). Same. RQD =45. | |
| | | C | | | | | | | | Rock fresh in both core runs, minor staining | |
| | | C | | | | | | | | on joints. | |
| | | C | | | | | | | | | |
| 25 | | C | | | | | | | | | |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

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**NEWBURGH, NY 12550**
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| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/7/2024 | Project No.: | 24203 |
| WEATHER: | Clear, 65° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Building Area, Middle of Building | **BORING NO.** | **B2** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 419 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 5 | SC-SM | 4 | **3** | **8** | 18 | Very Moist | Till- Sand with some gravel, some silty clay | Blacktop |
| | | | | | | | | | | Yellowish brown and brown, mottled | pavement. |
| 2-4 | **S2** | SS | 20 | SC-SM | 17 | **16** | **15** | 21 | Moist | Till- Sand with some gravel, little silty clay | |
| | | | | | | | | | | Yellowish brown | |
| 5 | | | | | | | | | | | |
| 5-7 | **S3** | SS | 2 | SC-SM | 20 | **30** | **29** | 35 | Very Moist | Till- Sand with some gravel, some silty clay | |
| | | | | | | | | | | Grey with brown, fine mottling | |
| 7-9 | **S4** | SS | 24 | SM | 35 | **32** | **38** | 50/4 | Moist | Till- Sand with some weathered shale | |
| | | | | | | | | | | fragments, little silt. Cohesionless. | |
| 10 | | | | | | | | | | Grey with brown | |
| 10-12 | **S5** | SS | <1 | Rock | 50/1 | | | | - | Shale fragments. Slightly weathered | Refusal 10' |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

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**PATTONGEOTECH.COM 845 275-7732**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/7/2024 | Project No.: | 24203 |
| WEATHER: | Clear, 65° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Building Area, North Corner | **BORING NO.** | **B3** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 420 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 16 | GC-GM | 6 | **6** | **6** | 6 | Moist | Till- Gravel and angular sand with little silty clay | Blacktop |
| | | | | | | | | | | Grey with brown, faint mottling | pavement. |
| 2-4 | **S2** | SS | 24 | CL-ML | 7 | **11** | **14** | 58 | Moist | Till- Silty clay with little angular Fmc sand. | |
| | | | | | | | | | | Lg. pc. weathered shale. Yellowish brown and | |
| 5 | | | | | | | | | | pale grey, mottled. Layer of gravel. | |
| 5-7 | **S3** | SS | 24 | GM, | 31 | **50** | **53** | 50/3 | Moist | Weathered shale: Angular gravel with some | |
| | | | | SM | | | | | | sand, little silt, then Sand with little silt. | |
| | | | | | | | | | | Cohesionless. Brownish grey | |
| | | | | | | | | | | | Refusal 9.5' |
| 10 | | | | | | | | | | | |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

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| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/7/2024 | Project No.: | 24203 |
| WEATHER: | Clear, 65° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Building Area, East Corner | **BORING NO.** | **B4** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 420 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 15 | SM | 2 | **3** | **6** | 7 | Moist | Till Fill: Fmc sand with some silt, little gravel. | |
| | | | | | | | | | | Yellowish brown, fine mottling | |
| 2-4 | **S2** | SS | 10 | CL-ML | 7 | **5** | **5** | 13 | Very Moist | Silty clay with little sand, traces gravel. | |
| | | | | | | | | | | Large pieces of gravel in top 4". | |
| 5 | | | | | | | | | | Pale yellowish brown with brown, mottled | |
| 5-7 | **S3** | SS | 10 | SM | 15 | **11** | **16** | 15 | Very Moist | Till: Sand w/little gravel, little silt. Cohesionless. | |
| | | | | | | | | | | Moderate yellowish brown with brown mottling | |
| 7-9 | **S4** | SS | 24 | SM | 15 | **17** | **23** | 20 | Wet | Same, to Till: Sand with some gravel, little silt. | PEN 10ksf |
| | | | | | | | | | | Cohesive. Moderate yellowish brown with | |
| 10 | | | | | | | | | | faint mottling | |
| 10-12 | **S5** | SS | 24 | SC-SM | 17 | **44** | **28** | 19 | Wet | Till- Sand with some gravel, some silty clay. | |
| | | | | | | | | | | Moderate yellowish brown and yellowish | |
| | | | | | | | | | | brown, mottled. | Refusal 13.5' |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

**KEVIN L. PATTON, P.E.**
**36 PATTON ROAD**
**NEWBURGH, NY 12550**
**PATTONGEOTECH.COM 845 275-7732**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/8/2024 | Project No.: | 24203 |
| WEATHER: | Cloudy, 70° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Building Area, West Corner | **BORING NO.** | **B5** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 416 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 10 | SC | 4 | **4** | **3** | 3 | Wet | Till: Clay w/some sand, to Sand and clay with | |
| | | | | | | | | | | little gravel. Brown to moderate yellowish brown, faint mottling. | |
| 2-4 | **S2** | SS | 16 | SC, | 2 | **2** | **3** | 3 | Wet | Same, to Till: Clay with some sand, traces | PEN 1.9ksf |
| | | | | CL | | | | | | gravel. Moderate yellowish brown with | |
| 5 | | | | | | | | | | brown, finely mottled. | |
| 5-7 | **S3** | SS | 1 | GC (?) | 7 | **7** | **11** | 11 | Wet | Till. Piece of gravel with sandy clay coating. | |
| | | | | | | | | | | Moderate yellowish brown. Small sample. | |
| 7-9 | **S4** | SS | 24 | SM | 10 | **35** | **35** | 34 | Very moist, | Till- Angular shale sand with little silt, pcs. of weathered shale, to | |
| | | | | | | | | | then Moist | Weathered shale and angular sand with little silt, trace gravel. | |
| 10 | | | | | | | | | | Grey with yellowish brown mottling | Refusal 10' |
| 10 | **S5** | SS/C | 0-SS | - | 50/1 | | | | - | No Recovery (Split Spoon.) | Cored 10-15' |
| 10-15 | **R1** | C | 100% | Rock | | | | | - | Bedrock. Gray siltstone with little to some | |
| | | C | | | | | | | | gray fine sandstone, trace shale. Stained and | |
| | | C | | | | | | | | slightly weathered along joints to 13.2 ft, then | |
| 15 | | C | | | | | | | | slightly stained on joints, rock fresh. | |
| | | C | | | | | | | | RQD = 0. | |
| 20 | | | | | | | | | | | |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

**KEVIN L. PATTON, P.E.**
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**NEWBURGH, NY 12550**
**PATTONGEOTECH.COM 845 275-7732**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/8/2024 | Project No.: | 24203 |
| WEATHER: | Cloudy, 70° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Retaining Wall, South End | **BORING NO.** | **B6** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 414 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 5 | SC | 2 | **1/12** | | 1 | Wet | Till Fill: Sand with some clay, little gravel, tr. | |
| | | | | | | | | | | roots. Moderate yellowish brown, slight mottling | |
| 2-4 | **S2** | SS | 14 | CL | 1 | **2** | **3** | 3 | Wet | Till- Clay with some sand, traces gravel | PEN 3.2 ksf |
| | | | | | | | | | | Olive grey, slight mottling | |
| 5 | | | | | | | | | | | |
| 5-7 | **S3** | SS | 2 | CL, OL | 3 | **2** | **5** | 13 | Wet | Till: Clay with some sand, trace gravel, lump of | Small Sample |
| | | | | | | | | | | Topsoil w/fine roots. Pale brown, Dusky brown | |
| 7-9 | **S4** | SS | 1 | CL-ML | 23 | **19** | **19** | 34 | Wet | Silty clay with little sand, traces gravel. | Small Sample |
| | | | | | | | | | | Yellowish brown | |
| 10 | | | | | | | | | | | |
| 10-12 | **S5** | SS | 16 | ML | 11 | **19** | **26** | 50/2 | Wet | Till- Silt with some sand, some fragments of | |
| | | | | | | | | | | weathered shale. Slightly cohesive. Brown | Refusal 11.5' |
| | | | | | | | | | | and grey, mottled. | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

**KEVIN L. PATTON, P.E.**
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**NEWBURGH, NY 12550**
**PATTONGEOTECH.COM 845 275-7732**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/8/2024 | Project No.: | 24203 |
| WEATHER: | Cloudy, 70° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Retaining Wall, Middle | **BORING NO.** | **B7** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 408 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 5 | CL-ML | 4 | **4** | **2** | 2 | Wet | Silty clay with some sand, traces gravel, few roots | |
| | | | | | | | | | | Yellowish brown, mottled | |
| 2-4 | **S2** | SS | 8 | ML | 2 | **2** | **3** | 3 | Very Moist | Silt with little sand, trace gravel, trace fine | |
| | | | | | | | | | | roots. Pale brown with brown, fine mottling | |
| 5 | | | | | | | | | | | |
| 5-7 | **S3** | SS | 1 | CL | 4 | **10** | **12** | 14 | Wet | Till- Clay with some sand, trace gravel | Small Sample |
| | | | | | | | | | | Yellowish brown and grey, mottled | |
| 7-9 | **S4** | SS | 12 | SC | 16 | **24** | **17** | 31 | Wet | Till- Sand and clay with little gravel | |
| | | | | | | | | | | Brown and grey, strong mottling | |
| 10 | | | | | | | | | | | |
| 10-12 | **S5** | SS | 18 | GC | 18 | **32** | **20** | 20 | Wet | Till- Weathered shale gravel with some sand, | |
| | | | | | | | | | | layers of fine sandy clay. Brown and grey, | |
| | | | | | | | | | | mottled | Refusal 13' |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

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| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | New Police Facility, Town of Montgomery, N.Y. | | |
| DATE: | 5/8/2024 | Project No.: | 24203 |
| WEATHER: | Cloudy, 70° | | |

## SOIL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| DRILLING COMPANY: | General Borings | LOCATION: | Retaining Wall North End | **BORING NO.** | **B8** |
| DRILLER AND HELPER: | Jim Casson, Howie | | | | |
| HAMMER TYPE: | Automatic Hammer | APPROX. ELEV.: | 410 | | |
| INSPECTOR: | Warren Patton | WATER DEPTH: | | | |

| Feet | SAMPLE # | SAMPLE Type | SAMPLE Rec. | USCS SOIL CLASS | SPT TEST, BLOWS/6" 0-6 | 6-12 | 12-18 | 18-24 | MOISTURE | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2 | **S1** | SS | 10 | CL | 2 | **1** | **1** | 2 | Wet | Clay with some sand, trace gravel, some fine | PEN 1.7ksf |
| | | | | | | | | | | roots. Pale brown | |
| 2-4 | **S2** | SS | 8 | CL | 1 | **6** | **6** | 8 | Wet | Clay with some sand, trace gravel | PEN 3ksf |
| | | | | | | | | | | Grey with brown, fine mottling | |
| 5 | | | | | | | | | | | |
| 5-7 | **S3** | SS | 12 | CL-ML | 1 | **6** | **6** | 3 | Wet | Silty clay with some sand, trace gravel | PEN 2.3ksf |
| | | | | | | | | | | Pale yellowish grey with orange, fine mottling | |
| 7-9 | **S4** | SS | 16 | CL, SC | 14 | **6** | **6** | 12 | Wet | Till- Clay with traces sand, layered with Sand | PEN 1.7ksf |
| | | | | | | | | | | and clay with little gravel. | Grinding 9-10' |
| 10 | | | | | | | | | | Grey and yellowish brown, mottled. | |
| 10-12 | **S5** | SS | 14 | SC-SM | 9 | **14** | **13** | 50/5 | Wet | Till. Angular shale sand and gravel with some | |
| | | | | | | | | | | silty clay. Moderate yellowish brown and | |
| | | | | | | | | | | yellowish brown, slight mottling. | Refusal 13' |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |
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COMMENTS:

DRILLING METHOD: HSA - Hollow-Stem Auger MR - Mud-Rotary MEASUREMENTS IN FEET AND INCHES

SAMPLE/TEST TYPES: SS - SPLIT SPOON C - CORE T - UNDISTURBED TUBE AUG - AUGER CUTTINGS
PEN - HAND PENETROMETER TOR - TORVANE V - VANE SHEAR

**ADG KEVIN L. PATTON, P.E.**
**36 PATTON ROAD**
**NEWBURGH, N.Y. 12550**
**845 275-7732 PATTONGEOTECH.COM**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery, New Police Station | | |
| PROJECT NO. | 24203 | DATE CORED: | May 7, 2024 |

# ROCK CORE LOG

| | | | | | | |
|---|---|---|---|---|---|---|
| SURFACE ELEV.: | ±418 ft | TOTAL DEPTH: | 25 feet | CORE SIZE: | BORING NO. | **B1** |
| LOGGED BY: | Kevin Patton | DATE LOGGED: | 6/3/2024 | NX (2.0 inch.) | | **PAGE 1 of 2** |

| Depth, ft. | Run No. | % Rec. | RQD | Joints and Fractures | Description |
|---|---|---|---|---|---|
| 0-15 | --- | --- | --- | --- | Drilled through soil, little weathered rock. |
| 15-20 | 1 | 100 | 50 | Fractures fine, tight, with hard surfaces, fresh to slightly stained. About 10-15% parallel to beds.<br><br>Most spaced 3 to 8 inches.<br>17.25-17.75: Spaced 1 to 3 inches.<br><br>Most fractures dip 47º. Beds dip 25º at 15.3 ft, becoming steeper. | Bedrock, "Shale," Ordovician-age Normanskill Formation. Composed of medium dark gray siltstone with some medium light gray fine greywacke sandstone, with very few thin beds of shale. The siltstone and sandstone are in layers a few inches thick, and inter-bedded in thin layers. Minor cross-bedding and soft-sediment deformation features are occasionally present in the rock. The rock is fresh and hard.<br><br>15.0-16.2: Fine sandstone with some siltstone<br>16.2-17.8: Siltstone with some sandstone<br>17.8-18.2: Fine sandstone<br>18.2-20.0: Siltstone with little sandstone |
| 20-25 | 2 | 100 | 45 | Similar. Most fractures dip 47º. Beds dip 34º at 22.8 ft, 30º at 24.2 ft; varies locally.<br><br>20.8-21.3: Steep irregular fracture. | 20.0-22.3: Siltstone with some thin, indistinct fine sandstone layers.<br>20.8-21.3: Steep irregular fracture<br>22.3-23.8: Siltstone with traces fine sandstone<br>23.8-25.0: Siltstone and sandstone layers, thin to 2.5 inches thick. |

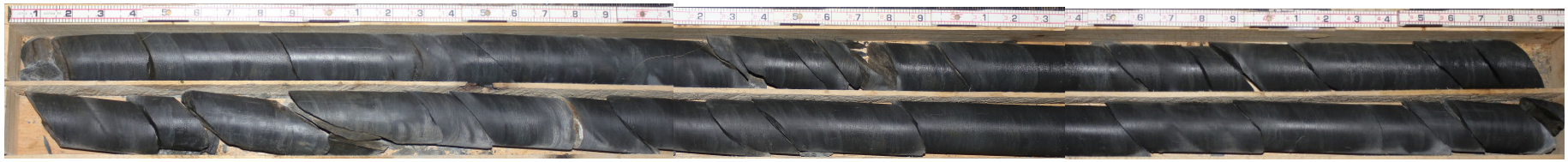
Photographs are provided on the next page.
% Rec: Percent Recovery, recovered length of core divided by length drilled.
RQD: Rock Quality Designation. The sum of the lengths of unbroken core sections at least four inches in length, divided by the length drilled.

**ADG KEVIN L. PATTON, P.E.**
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| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery, New Police Station | | |
| PROJECT NO. | 24203 | DATE CORED: | May 2024 |

# ROCK CORE LOG

| | | | | | | |
|---|---|---|---|---|---|---|
| SURFACE ELEV.: | ±418 ft | TOTAL DEPTH: | 25 feet | CORE SIZE: | BORING NO. | **B1** |
| LOGGED BY: | Kevin Patton | DATE LOGGED: | 6/3/2024 | NX (2.0 inch.) | | **PAGE 2 of 2** |





ABOVE: Photo of the rock core in a moist condition. The first run, from 15 to 20 feet, is in the top row, beginning at left. The scale divisions are 0.1 foot.

LEFT: Close-up, dry condition. The core section in the middle was broken in a longitudinal core splitter, but it did not break cleanly in half. The broken piece was from approximately 23.9 feet depth and was siltstone with thin beds of fine sandstone.

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| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery, New Police Station | | |
| PROJECT NO. | 24203 | DATE CORED: | May 8, 2024 |

# ROCK CORE LOG

| | | | | | | |
|---|---|---|---|---|---|---|
| SURFACE ELEV.: | ±416 feet | TOTAL DEPTH: | 15 feet | CORE SIZE: | BORING NO. | **B5** |
| LOGGED BY: | Kevin Patton | DATE LOGGED: | 6/3/2024 | NX (2.0 inch.) | | **PAGE 1 of 2** |

| Depth, ft. | Run No. | % Rec. | RQD | Joints and Fractures | Description |
|---|---|---|---|---|---|
| 0-10 | --- | --- | --- | --- | Drilled through soil and approximately two feet of weathered shale. |
| 10-15 | 1 | 100 | 0 | 10.0-11.1: Fractures spaced 1-3 inches, most on bedding planes, dipping 39º at 10.6 ft.<br>11.1-15.0: Fractures half on bedding planes, half oblique.<br>11.1-13.7: Spaced 1 to 2 inches<br>12.8: Fractures dip 36º (beds,) 48º.<br>13.7-15.0: Spaced 2 to 3 inches<br>14.7: Steep fracture, 66º dip. | Bedrock, "Shale," Ordovician-age Normanskill Formation. Composed of medium dark gray siltstone with some medium light gray fine greywacke sandstone, with very few thin beds of shale. The siltstone and sandstone are in layers a few inches thick, and inter-bedded in thin layers. Minor cross-bedding and soft-sediment deformation features are occasionally present in the rock.<br><br>10.0-13.2: Siltstone and fine sandstone, thin layers. Iron-stained and slightly weathered. Hard.<br>13.2-13.8: Siltstone and fine sandstone, thin layers. Stained and very slightly weathered along joints and fractures. Hard.<br>13.8-15.0: Siltstone layers up to 3 in. thick, with thin layers of fine sandstone. Fresh hard rock, slightly stained on joints. |

Photographs are provided on the next page.
% Rec: Percent Recovery, recovered length of core divided by length drilled.
RQD: Rock Quality Designation. The sum of the lengths of unbroken core sections at least four inches in length, divided by the length drilled.

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845 275-7732 PATTONGEOTECH.COM

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery, New Police Station | | |
| PROJECT NO. | 24203 | DATE CORED: | May 8, 2024 |

# ROCK CORE LOG

| | | | | | | |
|---|---|---|---|---|---|---|
| SURFACE ELEV.: | ±416 feet | TOTAL DEPTH: | 15 feet | CORE SIZE: | BORING NO. | **B5** |
| LOGGED BY: | Kevin Patton | DATE LOGGED: | 6/3/2024 | NX (2.0 inch.) | | **PAGE 2 of 2** |






ABOVE: Photo of the rock core in a moist condition. The top of the core is at left. The scale divisions are 0.1 foot.

LEFT: Close-up, dry condition. The core section in the middle was broken in a longitudinal core splitter, but it did not break cleanly in half. The broken piece was from approximately 13.6 feet depth and consisted of thin interbedded layers of siltstone and fine sandstone.

# KEVIN L. PATTON, P.E.

36 PATTON ROAD

NEWBURGH, NY 12550

845 275-7732 PATTONGEOTECH.COM


| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery - New Police Facility | | |
| PROJECT No.: | 24203 | SAMPLE LOT No.: | 240508-1 |
| DATE SAMPLED: | 5/7-8/2024 | DATE TESTED: | 5/15/2024 |
| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

**MOISTURE CONTENT OF SOIL**

TEST METHOD: ASTM D2216

| SAMPLE NO. | DEPTH,FT. | % MOISTURE |
|---|---|---|
| B1 S1 | 1 | 12.6 |
| B1 S2 | 3 | 10.2 |
| B1 S4 | 8 | 4.4 |
| B1 S5 | 11 | 11.8 |
| B2 S1 | 1 | 7.6 |
| B2 S2 | 3 | 7.9 |
| B3 S1 | 1 | 4.2 |
| B3 S2 | 3 | 11.5 |
| B3 S3 | 6 | 3.7 |
| B4 S1 | 1 | 9.3 |
| B4 S2 | 3 | 13.8 |
| B4 S3 | 6 | 7.5 |
| B4 S5 | 11 | 10.7 |
| B5 S1 | 1 | 12.3 |
| B5 S4 | 8 | 9.2 |
| B6 S1 | 1 | 10.5 |
| B6 S2 | 3 | 12.4 |
| B6 S3 | 6 | 23.9 |
| B6 S5 | 11 | 11.3 |
| B7 S1 | 1 | 19.1 |
| B7 S2 | 3 | 21.8 |
| B7 S4 | 8 | 11.5 |
| B7 S5 | 11 | 10.4 |
| B8 S1 | 1 | 21.9 |
| B8 S2 | 3 | 18.4 |
| B8 S3 | 6 | 15.9 |
| B8 S4 | 8 | 15.9 |
| B8 S5 | 11 | 10.4 |

Moisture content is expressed as a percent of the dry mass of the soil.

Reviewed by: *Kevin Patton*

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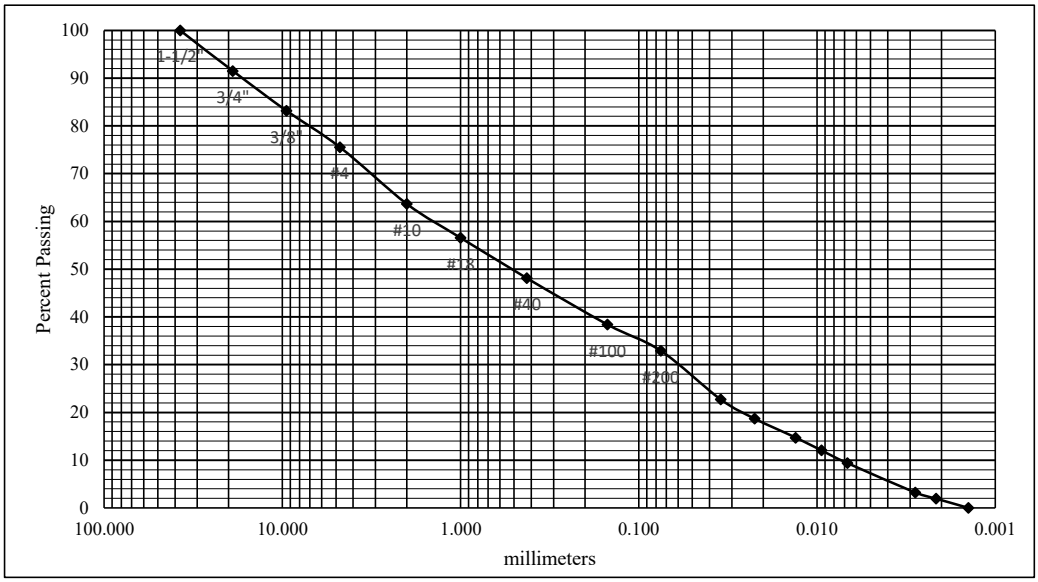
| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery - New Police Facility | | |
| PROJECT No.: | 24203 | SAMPLE LOT No.: | 240508-1 |
| DATE SAMPLED: | 5/7-8/2024 | DATE TESTED: | 5/15/2024 |
| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

**SIEVE-AND-HYDROMETER ANALYSIS TEST REPORT**

TEST METHOD(s): ASTM D422, AASHTO T88

| | |
|---|---|
| **Sample Location** | B1-S3 |
| **Depth** | 6 feet |

| Sieve Size | | Percent Retained | Percent Passing | Size Categories | |
|---|---|---|---|---|---|
| inches | mm | | | USCS | USDA |
| 1-1/2" | 37.5 | 0 | 100 | Gravel, 3" to #4 | Gravel, 3" to #10 |
| 3/4" | 19.0 | 8 | 92 | | |
| 3/8" | 9.5 | 9 | 83 | | |
| #4 | 4.75 | 7 | 76 | | |
| #10 | 2.00 | 12 | 64 | Sand, #4 to #200 | |
| #18 | 1.00 | 7 | 57 | | Sand, #10 to 0.050mm |
| #40 | 0.425 | 9 | 48 | | |
| #100 | 0.150 | 10 | 38 | | |
| #200 | 0.075 | 5 | 33 | | |
| Hydrometer Analysis | 0.050 | 5 | 28 | Silt and Clay, pass #200 | |
| | 0.020 | 10 | 18 | | Silt, 0.050 to 0.002mm |
| | 0.010 | 5 | 13 | | |
| | 0.005 | 6 | 7 | | |
| | 0.002 | 5 | 2 | | |
| | 0.001 | 2 | 0 | | Clay <0.002 |




| **USDA Particle Size Classification:** | | **USDA Textural Class:** Very Gravelly Sandy Loam |
|---|---|---|
| Gravel, 3" to 2.00mm | 36 | |
| Sand, 2.00 to 0.050mm: | 36 | **USCS Classification (ASTM D2487/D2488):** |
| Silt, 0.050 to 0.002mm: | 26 | SC-SM, Silty Clayey Sand with Gravel |
| Clay, <0.002mm | 2 | |
| Total | 100 | Atterberg Limits were determined by: Test |

Reviewed by: *Kevin Patton*

Form HYD

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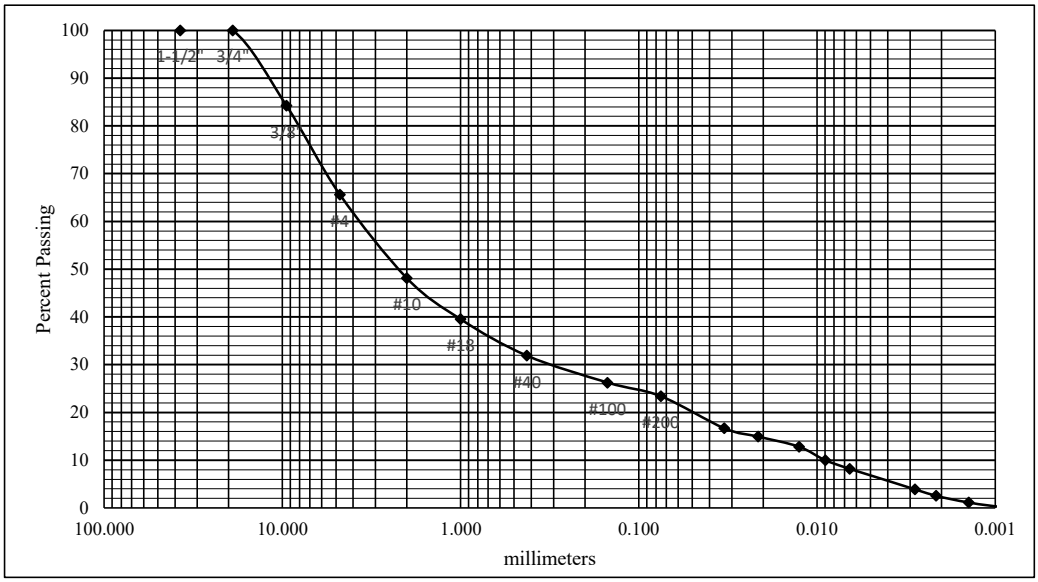

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery - New Police Facility | | |
| PROJECT No.: | 24203 | SAMPLE LOT No.: | 240508-1 |
| DATE SAMPLED: | 5/7-8/2024 | DATE TESTED: | 5/15/2024 |
| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

**SIEVE-AND-HYDROMETER ANALYSIS TEST REPORT**

TEST METHOD(s): ASTM D422, AASHTO T88

| | |
|---|---|
| **Sample Location** | B2-S4 |
| **Depth** | 8 feet |

| Sieve Size | | Percent Retained | Percent Passing | Size Categories | |
|---|---|---|---|---|---|
| inches | mm | | | USCS | USDA |
| 1-1/2" | 37.5 | 0 | 100 | Gravel, 3" to #4 | Gravel, 3" to #10 |
| 3/4" | 19.0 | 0 | 100 | | |
| 3/8" | 9.5 | 16 | 84 | | |
| #4 | 4.75 | 18 | 66 | | |
| #10 | 2.00 | 18 | 48 | Sand, #4 to #200 | |
| #18 | 1.00 | 8 | 40 | | Sand, #10 to 0.050mm |
| #40 | 0.425 | 8 | 32 | | |
| #100 | 0.150 | 6 | 26 | | |
| #200 | 0.075 | 3 | 23 | | |
| Hydrometer Analysis | 0.050 | 3 | 20 | Silt and Clay, pass #200 | |
| | 0.020 | 5 | 15 | | Silt, 0.050 to 0.002mm |
| | 0.010 | 4 | 11 | | |
| | 0.005 | 4 | 7 | | |
| | 0.002 | 5 | 2 | | |
| | 0.001 | 2 | 0 | | Clay <0.002 |




| **USDA Particle Size Classification:** | | **USDA Textural Class:** Very Gravelly Sandy Loam |
|---|---|---|
| Gravel, 3" to 2.00mm | 52 | |
| Sand, 2.00 to 0.050mm: | 28 | **USCS Classification (ASTM D2487/D2488):** |
| Silt, 0.050 to 0.002mm: | 18 | SM, Silty Sand with Gravel |
| Clay, <0.002mm | 2 | |
| Total | 100 | Atterberg Limits were determined by: Estimated (ASTM D2488) |

Reviewed by: *Kevin Patton*

Form HYD

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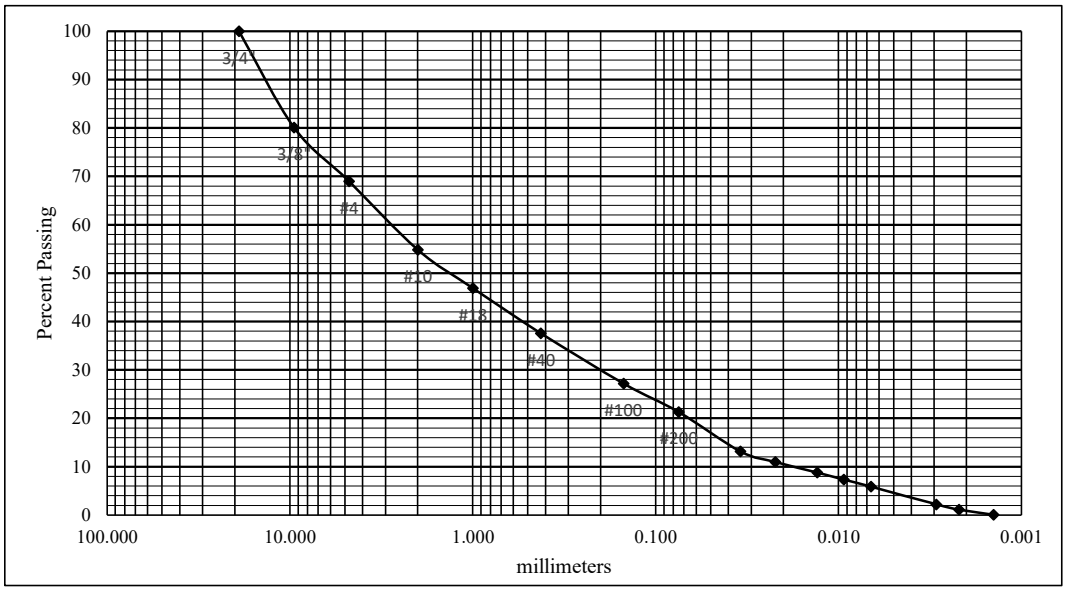

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery - New Police Facility | | |
| PROJECT No.: | 24203 | SAMPLE LOT No.: | 240508-1 |
| DATE SAMPLED: | 5/7-8/2024 | DATE TESTED: | 5/15/2024 |
| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

**SIEVE-AND-HYDROMETER ANALYSIS TEST REPORT**

TEST METHOD(s): ASTM D422, AASHTO T88

| | |
|---|---|
| **Sample Location** | B4-S4 |
| **Depth** | 8 feet |

| Sieve Size | | Percent Retained | Percent Passing | Size Categories | |
|---|---|---|---|---|---|
| inches | mm | | | USCS | USDA |
| 3/4" | 19.0 | 0 | 100 | Gravel, 3" to #4 | Gravel, 3" to #10 |
| 3/8" | 9.5 | 20 | 80 | | |
| #4 | 4.75 | 11 | 69 | | |
| #10 | 2.00 | 14 | 55 | Sand, #4 to #200 | Sand, #10 to 0.050mm |
| #18 | 1.00 | 8 | 47 | | |
| #40 | 0.425 | 9 | 38 | | |
| #100 | 0.150 | 11 | 27 | | |
| #200 | 0.075 | 6 | 21 | | |
| Hydrometer Analysis | 0.050 | 4 | 17 | Silt and Clay, pass #200 | Silt, 0.050 to 0.002mm |
| | 0.020 | 6 | 11 | | |
| | 0.010 | 3 | 8 | | |
| | 0.005 | 3 | 5 | | |
| | 0.002 | 4 | 1 | | |
| | 0.001 | 1 | 0 | | Clay <0.002 |




| **USDA Particle Size Classification:** | | **USDA Textural Class:** Very Gravelly Sandy Loam |
|---|---|---|
| Gravel, 3" to 2.00mm | 45 | |
| Sand, 2.00 to 0.050mm: | 38 | **USCS Classification (ASTM D2487/D2488):** |
| Silt, 0.050 to 0.002mm: | 16 | SM, Silty Sand with Gravel |
| Clay, <0.002mm | 1 | |
| Total | 100 | Atterberg Limits were determined by: Estimated (ASTM D2488) |

Reviewed by: *Kevin Patton*

Form HYD

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**NEWBURGH, NY 12550**

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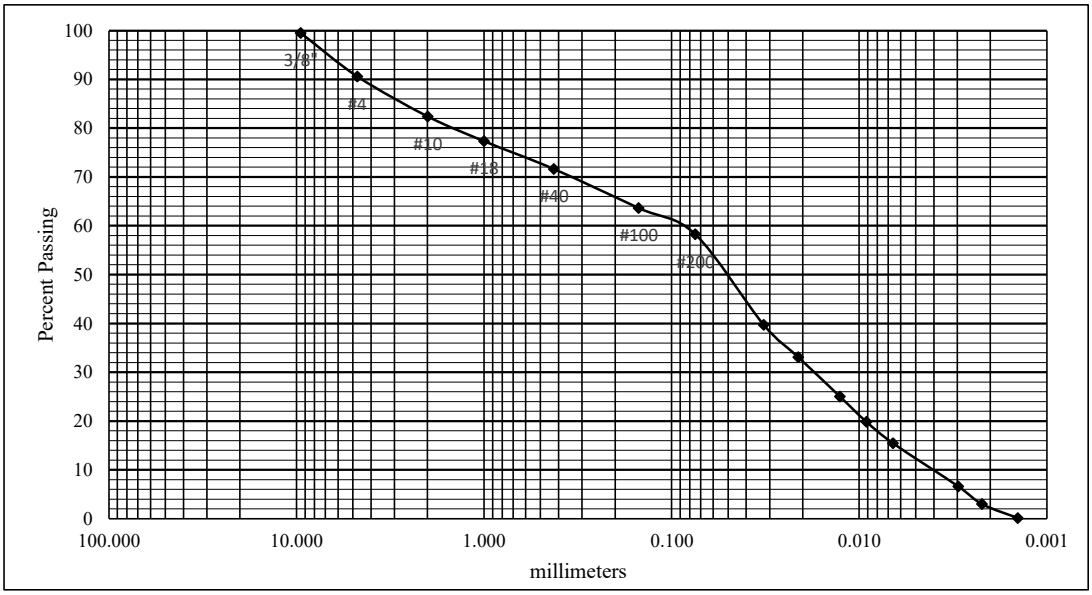

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery - New Police Facility | | |
| PROJECT No.: | 24203 | SAMPLE LOT No.: | 240508-1 |
| DATE SAMPLED: | 5/7-8/2024 | DATE TESTED: | 5/15/2024 |
| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

**SIEVE-AND-HYDROMETER ANALYSIS TEST REPORT**

TEST METHOD(s): ASTM D422, AASHTO T88

| | |
|---|---|
| **Sample Location** | B5-S2 |
| **Depth** | 3 feet |

| Sieve Size | | Percent Retained | Percent Passing | Size Categories | |
|---|---|---|---|---|---|
| inches | mm | | | USCS | USDA |
| 3/8" | 9.5 | 0 | 100 | Gravel, 3" to #4 | Gravel, 3" to #10 |
| #4 | 4.75 | 9 | 91 | | |
| #10 | 2.00 | 9 | 82 | Sand, #4 to #200 | |
| #18 | 1.00 | 5 | 77 | | Sand, #10 to 0.050mm |
| #40 | 0.425 | 5 | 72 | | |
| #100 | 0.150 | 8 | 64 | | |
| #200 | 0.075 | 6 | 58 | | |
| Hydrometer Analysis | 0.050 | 8 | 50 | Silt and Clay, pass #200 | |
| | 0.020 | 18 | 32 | | Silt, 0.050 to 0.002mm |
| | 0.010 | 11 | 21 | | |
| | 0.005 | 9 | 12 | | |
| | 0.002 | 10 | 2 | | |
| | 0.001 | 2 | 0 | | Clay <0.002 |




| **USDA Particle Size Classification:** | | **USDA Textural Class:** Gravelly Silt Loam |
|---|---|---|
| Gravel, 3" to 2.00mm | 18 | |
| Sand, 2.00 to 0.050mm: | 32 | **USCS Classification (ASTM D2487/D2488):** |
| Silt, 0.050 to 0.002mm: | 48 | CL, Sandy Lean Clay |
| Clay, <0.002mm | 2 | |
| Total | 100 | Atterberg Limits were determined by: Test |

Reviewed by: *Kevin Patton*

Form HYD

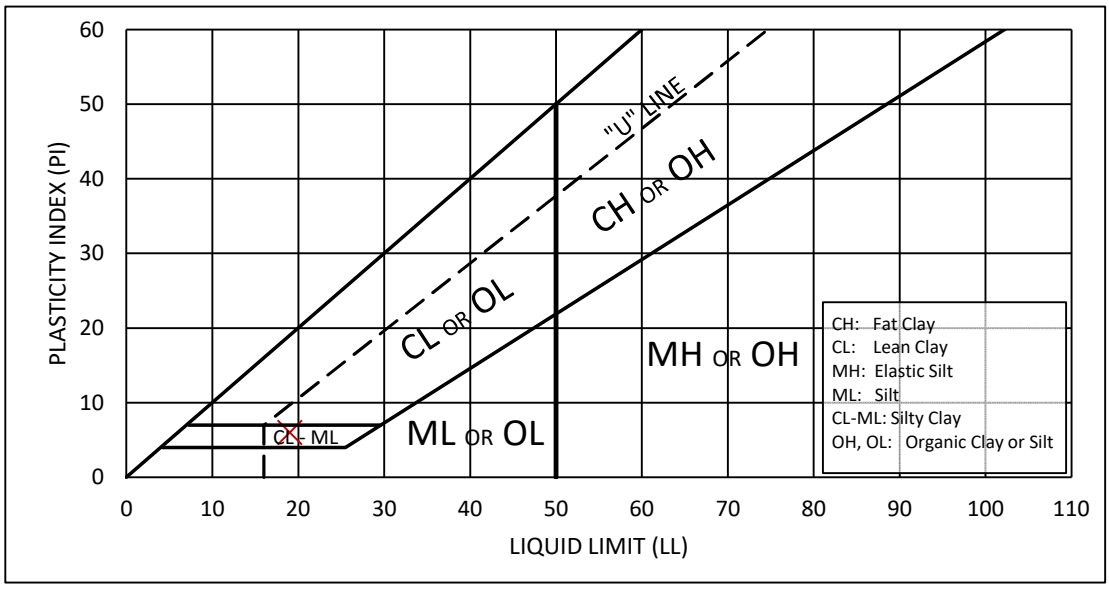
**KEVIN L. PATTON, P.E.**
**36 PATTON ROAD**
**NEWBURGH, NY 12550**
**845 275-7732 PATTONGEOTECH.COM**

| | | | |
|---|---|---|---|
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| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

## ATTERBERG LIMITS TEST

TEST METHODS: ASTM D4318/ AASHTO T89, T90

| | |
|---|---|
| **Sample Location** | B1-S3 |
| **Depth** | 6 feet |
| Percent Passing #40 | 48 |
| **Liquid Limit (LL)** | **19** |
| **Plastic Limit (PL)** | **13** |
| **Plasticity Index (PI)** | **6** |
| USCS Class of -#40 | CL-ML, Silty Clay |




LL, PL and PI values are moisture contents, expressed as percents of the dry soil mass.

Test is performed on the 'matrix' fraction of the soil, finer than the #40 (0.425mm) sieve.

The Liquid Limit is the moisture content at which the matrix fraction of the soil changes from a stiff to a flowing consistency. The plastic limit is the moisture content at which it changes from cohesive to crumbly. The Plasticity Index is the Liquid Limit minus the Plastic Limit. Test results plotting to the left of the U line (except non-plastic results) are unusual.

Reviewed by: *Kevin Patton*

Form ABL

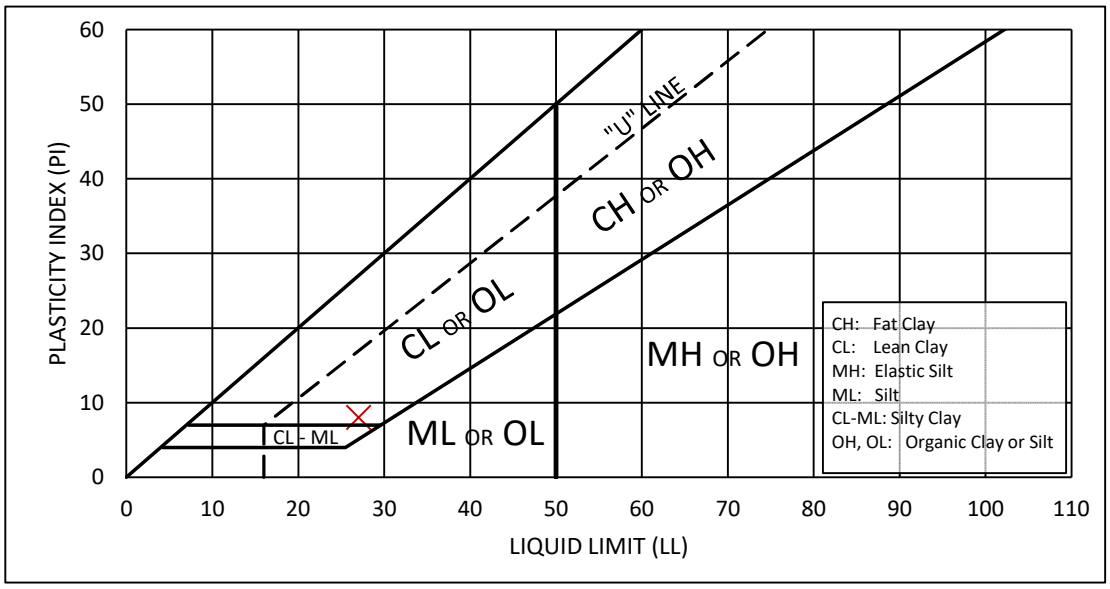
**KEVIN L. PATTON, P.E.**
**36 PATTON ROAD**
**NEWBURGH, NY 12550**
**845 275-7732 PATTONGEOTECH.COM**

| | | | |
|---|---|---|---|
| CLIENT: | ADG Architects | | |
| PROJECT: | Town of Montgomery - New Police Facility | | |
| PROJECT No.: | 24203 | SAMPLE LOT No.: | 240508-1 |
| DATE SAMPLED: | 5/7-8/2024 | DATE TESTED: | 5/15/2024 |
| SAMPLED BY: | Warren Patton | TESTED BY: | Wyeth Patton |

## ATTERBERG LIMITS TEST

TEST METHODS: ASTM D4318/ AASHTO T89, T90

| | |
|---|---|
| **Sample Location** | B5-S2 |
| **Depth** | 3 feet |
| Percent Passing #40 | 72 |
| **Liquid Limit (LL)** | **27** |
| **Plastic Limit (PL)** | **19** |
| **Plasticity Index (PI)** | **8** |
| USCS Class of -#40 | CL, Lean Clay |




LL, PL and PI values are moisture contents, expressed as percents of the dry soil mass.

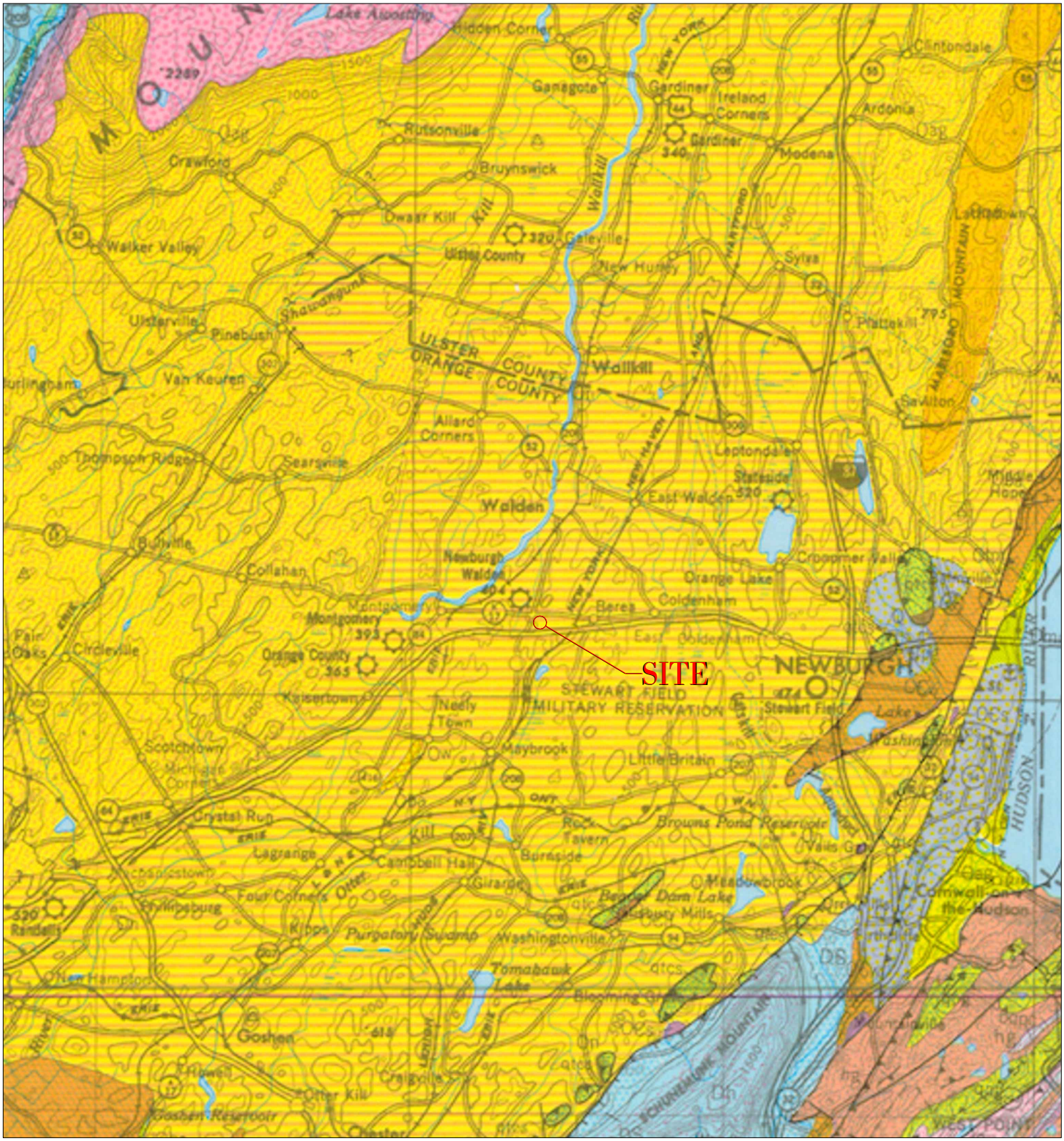
Test is performed on the 'matrix' fraction of the soil, finer than the #40 (0.425mm) sieve.

The Liquid Limit is the moisture content at which the matrix fraction of the soil changes from a stiff to a flowing consistency. The plastic limit is the moisture content at which it changes from cohesive to crumbly. The Plasticity Index is the Liquid Limit minus the Plastic Limit. Test results plotting to the left of the U line (except non-plastic results) are unusual.

Reviewed by: *Kevin Patton*

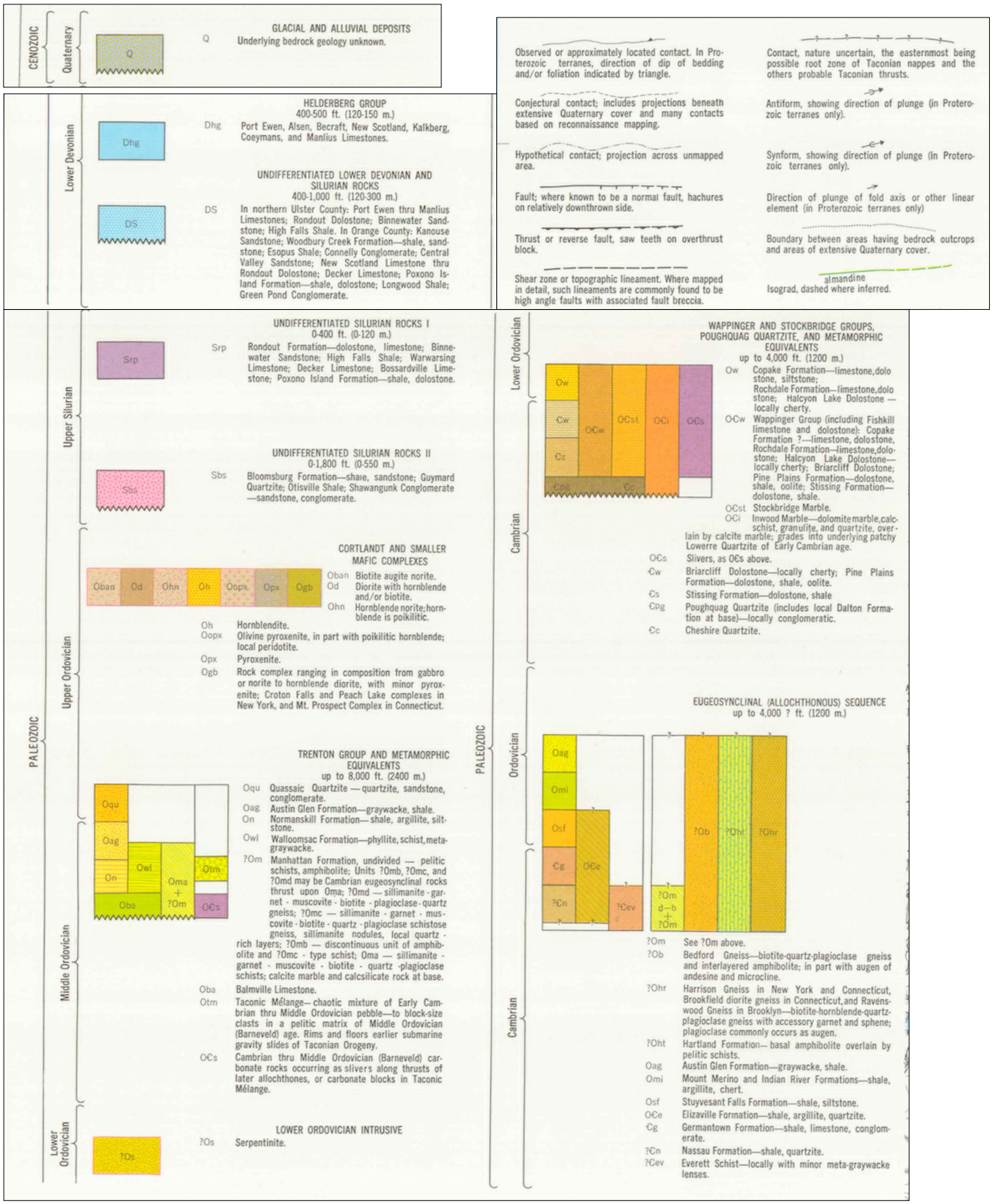
Form ABL

# BEDROCK GEOLOGIC MAP



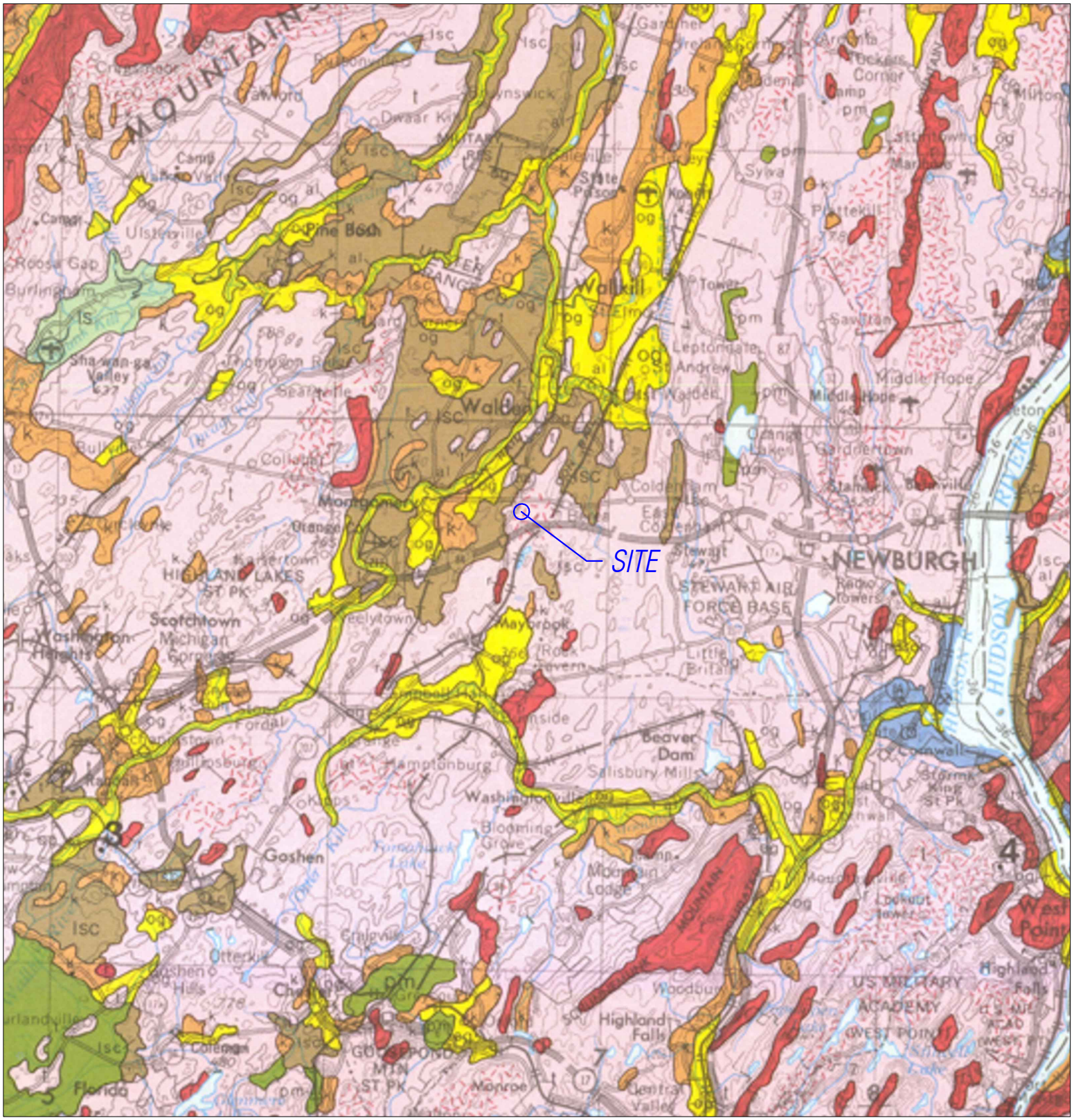

Approximate location of the project site, shown on part of the Bedrock Geologic Map of New York (1970.) The site is in the middle of a wide belt of Ordovician-age sedimentary bedrock consisting mostly of gray siltstone, shale and greywacke sandstone. The bedrock at the site is shown as Normanskill Formation (yellow with red stripes, symbol On,) which is the oldest member of this Ordovician sequence, with the Austin Glen Formation (yellow, symbol Oag,) overlying it, which in turn lies below the Quassaic quartzite (orange, Oqu.) These units form the bedrock of most of the Wallkill River valley.

# BEDROCK GEOLOGIC MAP KEY (PARTIAL)




**KEVIN L. PATTON, P.E.**

# SURFICIAL GEOLOGIC MAP




Approximate location of the project site, shown on a partial copy of the Surficial Geologic Map of New York (N.Y. State Museum, 1989.) The map indicates that the soils at and near the site are glacial till, shown in pink with the symbol 't' with a red stipple pattern added, indicating that bedrock is generally within three to ten feet of the surface. Areas where bedrock is mostly exposed or very shallow are indicated by red. Glacial outwash and lake deposits are indicated to the north and west.

**KEVIN L. PATTON, P.E.**

# EXPLANATION

al

**al – Recent deposits**
Generally confined to floodplains within a valley,
oxidized, non-calcareous, fine sand to gravel,
in larger valleys may be overlain by silt,
subject to frequent flooding, thickness 1-10 meters.

alf

**alf – Alluvial fan**
Generally confined to floodplains within a valley,
oxidized, non-calcareous, fine sand to gravel,
in larger valleys may be overlain by silt,
subject to frequent flooding, thickness 1-10 meters.

b

**b – Beach**
Sand and gravel deposit at marine shoreline,
thickness variable

bi

**bi – Barrier Island**
Sand and gravel deposit as barrier island,
south shore of Long Island,
may have associated dunes,
thickness variable.

pm

**pm – Swamp deposits**
Peat-muck, organic silt and sand in poorly drained areas,
un-oxidized,
may be overlying marl and lake silts,
potential land instability,
thickness generally 2-20 meters.

ld

**Ld – Lacastrine delta**
Coarse to fine gravel and sand,
stratified, generally well sorted,
deposited at a lake shoreline,
thickness variable (up to 100 meters)

lsc

**lsc – Lacustrine silt and clay**
Generally laminated silt and clay,
deposited in proglacial lakes,
generally calcareous,
potential land instability,
thickness variable (up to 100 meters)

ls

**ls – Lacustrine sand**
Sand deposits associated with large bodies of water,
generally a near-shore deposit or near a sand source,
well sorted, stratified,
generally quartz sand,
thickness variable (2-20 meters)

og

**og – Outwash sand and gravel**
Coarse to fine gravel with sand,
proglacial fluvial deposition,
well rounded and stratified,
generally finer texture away from ice border,
thickness variable (2-20 meters)

fg

**fg – Fluvial sand and gravel**
Deposits of sand and gravel,
occasional laterally continuous lenses of silt,
deposition farther from glacier,
age uncertain.

k

**k – Kame deposits**
Includes kames, eskers, kame terraces, kame deltas,
coarse to fine gravel and/or sand,
deposition adjacent to ice,
lateral variability in sorting, coarseness and thickness,
locally firmly cemented with calcareous cement,
thickness variable (10-30 meters)

km

**km – Kame moraine**
Variable texture (size and sorting) from boulders to sand,
deposition at an ice margin during deglaciation,
positive constructional relief,
locally cemented with calcareous cement,
thickness variable (10-30 meters).

tm

**tm – Till moraine**
More variable sorted than till,
generally more permeable than till,
deposition adjacent to ice,
more variably drained,
may include ablation till,
thickness variable (10-30 meters).

t

**t - Till**
Variable texture (e.g. clay, silt-clay, boulder clay),
usually poorly sorted diamict,
deposition beneath glacier ice,
relatively impermeable (loamy matrix),
variable clast content – ranging from abundant well-rounded
diverse lithologies in valley tills to relatively
angular, more limited lithologies in upland tills,
tends to be sandy in areas underlain by gneiss or sandstone,
potential land instability on steep slopes,
thickness variable (1-50 meters).

af

**af – Artificial fill**

r

**r – Bedrock**
Exposed or generally within 1 meter of surface.

**Bedrock stipple overprint**
Bedrock may be within 1-3 meters of surface,
may sporadically crop out,
variable mantle of rock debris and glacial till.

## MAP SYMBOLS

Contact

.3 Dated radiocarbon locality




Map Scale: 1:710 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

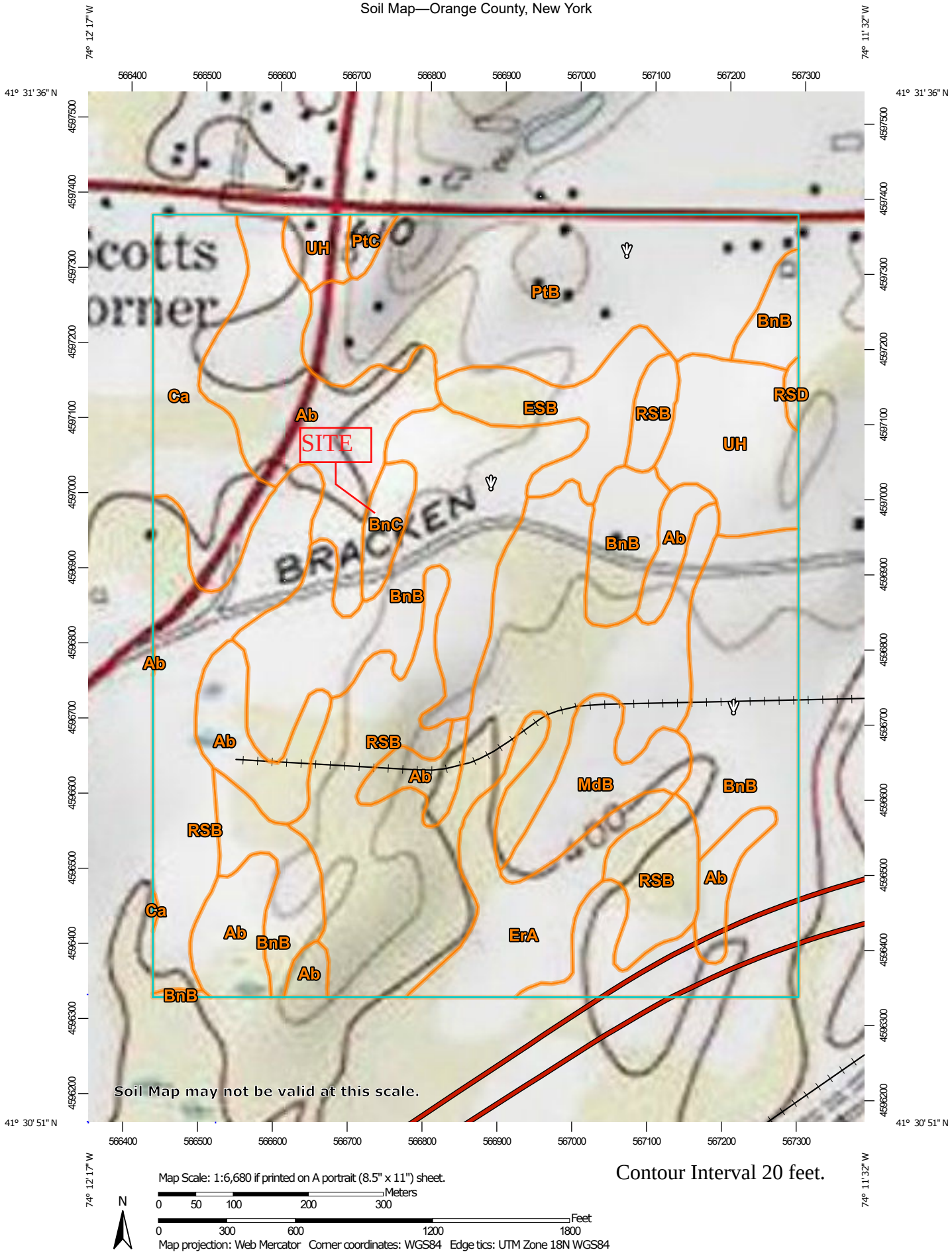



Map Scale: 1:6,680 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84




Map Scale: 1:6,680 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Contour Interval 20 feet.

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways

**Background**

- Topographic Map

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, New York
Survey Area Data: Version 24, Sep 6, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Ab | Alden silt loam | 31.7 | 14.2% |
| BnB | Bath-Nassau channery silt loams, 3 to 8 percent slopes | 55.4 | 24.8% |
| BnC | Bath-Nassau channery silt loams, 8 to 15 percent slopes | 2.0 | 0.9% |
| Ca | Canandaigua silt loam | 12.4 | 5.6% |
| ErA | Erie gravelly silt loam, 0 to 3 percent slopes | 9.9 | 4.4% |
| ESB | Erie extremely stony soils, gently sloping | 6.8 | 3.1% |
| MdB | Mardin gravelly silt loam, 3 to 8 percent slopes | 6.1 | 2.7% |
| PtB | Pittsfield gravelly loam, 3 to 8 percent slopes | 28.4 | 12.7% |
| PtC | Pittsfield gravelly loam, 8 to 15 percent slopes | 0.9 | 0.4% |
| RSB | Rock outcrop-Nassau complex, undulating | 58.7 | 26.3% |
| RSD | Rock outcrop-Nassau complex, hilly | 0.4 | 0.2% |
| UH | Udorthents, smoothed | 10.3 | 4.6% |
| **Totals for Area of Interest** | | **222.9** | **100.0%** |

# Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

*Hydrologic soil group* is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

*Group A.* Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

*Group B.* Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

*Group C.* Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

*Group D.* Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

*Classification* of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Percentage of rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

# Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

| Engineering Properties–Orange County, New York | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map unit symbol and soil name | Pct. of map unit | Hydrologic group | Depth | USDA texture | Classification | | Pct Fragments | | Percentage passing sieve number— | | | | Liquid limit | Plasticity index |
| | | | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | | | *In* | | | | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* |
| Ab—Alden silt loam | | | | | | | | | | | | | | |
| Alden | 80 | C/D | 0-9 | Silt loam | ML, OL | A-5, A-7 | 0- 0- 0 | 0- 0- 0 | 85-95-100 | 75-92-100 | 60-85-100 | 35-70-85 | 40-45-50 | 5-10-15 |
| | | | 9-36 | Silt loam, silty clay loam, very fine sandy loam | CL, CL-ML | A-4, A-6 | 0- 0- 1 | 0- 0- 3 | 85-90-100 | 75-85-100 | 60-75-95 | 35-60-90 | 20-28-35 | 5-10-15 |
| | | | 36-60 | Gravelly fine sandy loam, loam, silty clay loam | CL, CL-ML, GC, SC | A-2, A-4, A-6 | 0- 0- 3 | 0- 2- 5 | 65-80-95 | 50-70-92 | 35-55-90 | 20-35-85 | 20-28-35 | 5-10-15 |

| Engineering Properties–Orange County, New York | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map unit symbol and soil name | Pct. of map unit | Hydrologic group | Depth | USDA texture | Classification | | Pct Fragments | | Percentage passing sieve number— | | | | Liquid limit | Plasticity index |
| | | | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | | | *In* | | | | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* | *L-R-H* |
| BnC—Bath-Nassau channery silt loams, 8 to 15 percent slopes | | | | | | | | | | | | | | |
| Bath | 50 | C | 0-9 | Channery silt loam | GM, ML, SM | A-2, A-4 | 0- 0- 0 | 0- 2- 15 | 65-85-96 | 50-75-95 | 40-65-90 | 30-55-80 | 30-35-40 | 5-8 -10 |
| | | | 9-29 | Channery loam, channery silt loam, silt loam | GM, ML, SM | A-2, A-4 | 0- 0- 0 | 0- 2- 15 | 65-80-95 | 50-70-95 | 40-65-90 | 30-55-80 | 20-28-35 | NP-4 -7 |
| | | | 29-51 | Channery loam, very channery silt loam, channery sandy loam | GC-GM, GM, ML, SM | A-1, A-2, A-4 | 0- 0- 0 | 0- 5- 15 | 45-65-90 | 30-50-75 | 15-45-70 | 10-40-65 | 15-20-25 | NP-3 -6 |
| | | | 51-57 | Unweathered bedrock | — | — | 0- 0- 0 | 0- 0- 0 | — | — | — | — | — | — |
| Nassau | 30 | D | 0-10 | Channery silt loam | GM, ML, SM | A-4, A-2 | 0- 0- 0 | 0- 5- 15 | 55-70-90 | 45-60-75 | 35-55-70 | 25-50-65 | 25-31-37 | 1-6 -10 |
| | | | 10-17 | Very channery silt loam, very channery loam | GC-GM, GM | A-1, A-2, A-4 | 0- 0- 0 | 0- 9- 25 | 45-50-70 | 25-35-50 | 15-25-50 | 10-20-45 | 20-28-35 | 1-6 -10 |
| | | | 17-21 | Unweathered bedrock | — | — | 0- 0- 0 | 0- 0- 0 | — | — | — | — | — | — |

## Data Source Information

Soil Survey Area: Orange County, New York
Survey Area Data: Version 24, Sep 6, 2023

ATTACHMENT B

COMCHECK

# COM*check* Software Version COMcheckWeb

# Envelope Compliance Certificate

## Project Information

| | |
|---|---|
| Energy Code: | 2020 New York State Energy Conservation Construction Code |
| Project Title: | ToMPD |
| Location: | Montgomery, New York |
| Climate Zone: | 5a |
| Project Type: | New Construction |
| Vertical Glazing / Wall Area: | 24% |
| All Electric: | false |
| Is Renewable: | false |
| Has Battery: | false |
| Has Charger: | false |
| Has Heat Pump: | false |

Construction Site: Owner/Agent: Designer/Contractor:

## Efficiency Packages

| Description | Credit |
|---|---|
| Enhanced Envelope Performance | 1.0 |

**Credits: 1.0 Required 1.0 Proposed**

| Building Area | Floor Area |
|---|---|
| 1-Police Station (Office) : Nonresidential | 8440 |

## Envelope Assemblies

| Assembly | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Proposed U-Factor | Budget U-Factor(a) |
|---|---|---|---|---|---|
| Roof:Roof: Roof:Roof, [Bldg. Use 1 - Police Station] | 6570 | --- | 30.0 | 0.032 | 0.032 |
| Floor:Floor: Floor:Floor, Vertical 4 ft., [Bldg. Use 1 - Police Station] (c) | 350 | --- | 10.0 | 0.480 | 0.540 |
| NORTH | | | | | |
| Ext Wall:Ext. Wall - First Floor North: Ext Wall:Ext. Wall - First Floor North, [Bldg. Use 1 - Police Station] | 1565 | 20.0 | 8.0 | 0.058 | 0.064 |
| Door:Door 1N: Insulated Metal, Swinging, [Bldg. Use 1 - Police Station] | 63 | --- | --- | 0.210 | 0.370 |
| Door:Door 2N: Insulated Metal, Garage door 14% glazing, [Bldg. Use 1 - Police Station] | 40 | --- | --- | 0.130 | 0.310 |

| Assembly | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Proposed U-Factor | Budget U-Factor(a) |
|---|---|---|---|---|---|
| Window:Window AN: , Perf. Specs.: Product ID Window C, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 24 | --- | --- | 0.230 | 0.380 |
| Window:Window BN: , Perf. Specs.: Product ID Window A, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 72 | --- | --- | 0.230 | 0.380 |
| Ext Wall:Ext. Wall - Second floor North: Ext Wall:Ext. Wall - Second floor North, [Bldg. Use 1 - Police Station] | 798 | 20.0 | 8.0 | 0.058 | 0.064 |
| Door:Door 3N: Insulated Metal, Swinging, [Bldg. Use 1 - Police Station] | 20 | --- | --- | 0.210 | 0.370 |
| Window:Window DN: , Perf. Specs.: Product ID Window A, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 168 | --- | --- | 0.230 | 0.380 |
| Window:Window CN: , Perf. Specs.: Product ID Window C, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 48 | --- | --- | 0.230 | 0.380 |
| EAST | | | | | |
| Ext Wall:Ext. Wall - East: Ext Wall:Ext. Wall - East, [Bldg. Use 1 - Police Station] | 1650 | 20.0 | 8.0 | 0.058 | 0.064 |
| Window:Window BE: , Perf. Specs.: Product ID Window A, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 96 | --- | --- | 0.230 | 0.380 |
| Window:Window AE: , Perf. Specs.: Product ID Curtain Wall, SHGC 0.31, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 574 | --- | --- | 0.230 | 0.380 |
| SOUTH | | | | | |
| Ext Wall:Ext. Wall - South: Ext Wall:Ext. Wall - South, [Bldg. Use 1 - Police Station] | 2324 | 20.0 | 8.0 | 0.058 | 0.064 |
| Window:Window BS: , Perf. Specs.: Product ID Storefront, SHGC 0.31, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 140 | --- | --- | 0.230 | 0.380 |
| Window:Window AS: , Perf. Specs.: Product ID Window A, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 72 | --- | --- | 0.230 | 0.380 |
| Window:Window CS: , Perf. Specs.: Product ID Window B, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 96 | --- | --- | 0.210 | 0.380 |
| Window:Window DS: , Perf. Specs.: Product ID Curtain Wall, SHGC 0.31, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 344 | --- | --- | 0.270 | 0.380 |
| WEST | | | | | |
| Ext Wall:Ext. Wall - West A: Ext Wall:Ext. Wall - West A, [Bldg. Use 1 - Police Station] | 1289 | 20.0 | 8.0 | 0.058 | 0.064 |
| Door:Door AW: Insulated Metal, Swinging, [Bldg. Use 1 - Police Station] | 42 | --- | --- | 0.210 | 0.370 |
| Window:Window BW: , Perf. Specs.: Product ID Storefront, SHGC 0.31, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 134 | --- | --- | 0.230 | 0.380 |
| Window:Window CW: , Perf. Specs.: Product ID Window D, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 73 | --- | --- | 0.230 | 0.380 |

| Assembly | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Proposed U-Factor | Budget U-Factor(a) |
|---|---|---|---|---|---|
| Ext Wall:Ext. Wall - West B: Ext Wall:Ext. Wall - West B, [Bldg. Use 1 - Police Station] | 421 | 20.0 | 8.0 | 0.058 | 0.064 |
| Window:Window DW: , Perf. Specs.: Product ID Window C, SHGC 0.29, VT 0.70, [Bldg. Use 1 - Police Station] (b) | 48 | --- | --- | 0.230 | 0.380 |

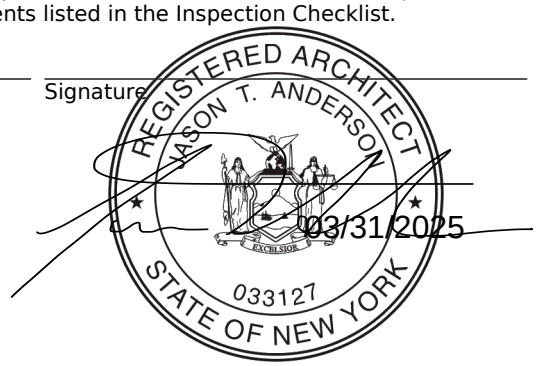
(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.
(c) Slab-On-Grade proposed and budget U-factors shown in table are F-factors.

**Envelope PASSES: Design 9% better than code**

## Envelope Compliance Statement

*Compliance Statement:* The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2020 New York State Energy Conservation Construction Code requirements in COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

| Jason Anderson | | 03/31/2025 |
|---|---|---|
| Name - Title | Signature | Date |



# COM*check* Software Version COMcheckWeb

# Inspection Checklist

Energy Code: 2020 New York State Energy Conservation Construction Code

Requirements: 100.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

| Section # & Req.ID | Plan Review | Complies? | Comments/Assumptions |
|---|---|---|---|
| C103.2 [PR1][1] | Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans. |
| C402.4.1 [PR10][1] | The vertical fenestration area <= 30 percent of the gross above-grade wall area. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans and specifications. |
| C402.4.1 [PR11][1] | The skylight area <= 3 percent of the gross roof area. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** N/A |
| C402.4.2 [PR14][1] | In enclosed spaces > 2,500 ft2 directly under a roof with ceiling heights >15 ft. and used as an office, lobby, atrium, concourse, corridor, storage, gymnasium/exercise center, convention center, automotive service, manufacturing, non-refrigerated warehouse, retail store, distribution/sorting area, transportation, or workshop, the following requirements apply: (a) the daylight zone under skylights is >= half the floor area; (b) the skylight area to daylight zone is >= 3 percent with a skylight VT >= 0.40; or a minimum skylight effective aperture >= 1 percent. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans and specifications. |

**Additional Comments/Assumptions:**

| 1 | High Impact (Tier 1) | 2 | Medium Impact (Tier 2) | 3 | Low Impact (Tier 3) |
|---|---|---|---|---|---|

| Section # & Req.ID | Footing / Foundation Inspection | Complies? | Comments/Assumptions |
|---|---|---|---|
| C303.2 [FO4][2] | Slab edge insulation installed per manufacturer's instructions. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans. |
| C303.2.1 [FO6][1] | Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans. |
| C105 [FO3][2] | Installed slab-on-grade insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | *See the Envelope Assemblies table for values.* |
| C402.2.4 [FO7][2] | Slab edge insulation depth/length. Slab insulation extending away from building is covered by pavement or >= 10 inches of soil. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>*See the Envelope Assemblies table for values.* |

**Additional Comments/Assumptions:**

| 1 | High Impact (Tier 1) | 2 | Medium Impact (Tier 2) | 3 | Low Impact (Tier 3) |
|---|---|---|---|---|---|

| Section # & Req.ID | Framing / Rough-In Inspection | Complies? | Comments/Assumptions |
|---|---|---|---|
| C303.1.3 [FR12][2] | Fenestration products rated in accordance with NFRC. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See specifications. |
| C303.1.3 [FR13][1] | Fenestration products are certified as to performance labels or certificates provided. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See specifications. |
| C402.4.3 [FR10][1] | Vertical fenestration SHGC value. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | *See the Envelope Assemblies table for values.* |
| C402.4.3, C402.4.3.4 [FR8][1] | Installed vertical fenestration U-factor and SHGC consistent with label specifications and as reported in plans and COMcheck reports. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | *See the Envelope Assemblies table for values.* |
| C402.5.7 [FR17][3] | Vestibules are installed on all building entrances. Doors have self-closing devices. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | **Exception:** Requirement does not apply.<br>**Location on plans/spec:** See plans and specifications. |

**Additional Comments/Assumptions:**

| 1 | High Impact (Tier 1) | 2 | Medium Impact (Tier 2) | 3 | Low Impact (Tier 3) |
|---|---|---|---|---|---|

| Section # & Req.ID | Mechanical Rough-In Inspection | Complies? | Comments/Assumptions |
|---|---|---|---|
| C402.5.5, C403.2.4.3 [ME3][3] | Stair and elevator shaft vents have motorized dampers that automatically close. Refernece section C403.7.7 for operational details. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | **Exception:** Requirement does not apply. |
| C403.7.7 [ME58][3] | Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed. Reference section language for operational details. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br><br>**Location on plans/spec:** See plans and specifications. |

**Additional Comments/Assumptions:**

| 1 | High Impact (Tier 1) | 2 | Medium Impact (Tier 2) | 3 | Low Impact (Tier 3) |
|---|---|---|---|---|---|

| Section # & Req.ID | Insulation Inspection | Complies? | Comments/Assumptions |
|---|---|---|---|
| C303.1 [IN3][1] | Roof insulation installed per manufacturer's instructions. Blown or poured loose-fill insulation is installed only where the roof slope is <=3 in 12. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans. |
| C402.2.1 [IN20][1] | Insulation installed on a suspended ceiling having ceiling tiles is not being specified for roor/ceiling assemblies. Continuous insulation board installed in 2 or more layers with edge joints offset between layers. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | **Exception:** Requirement does not apply. |
| C303.1 [IN10][2] | Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met. |
| C303.2 [IN7][1] | Above-grade wall insulation installed per manufacturer's instructions. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans. |
| C105 [IN6][1] | Installed above-grade wall insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | *See the Envelope Assemblies table for values.* |
| C402.2.3 [IN8][2] | Installed floor insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | *See the Envelope Assemblies table for values.* |
| C402.2.6 [IN18][3] | Radiant panels and associated components, designed for heat transfer from the panel surfaces to the occupants or indoor space are insulated with a minimum of R-3.5. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans. |
| C105 [IN2][1] | Installed roof insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports. For some ceiling systems, verification may need to occur during Framing Inspection. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | *See the Envelope Assemblies table for values.* |
| C402.5.1.1 [IN1][1] | All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans and specifications. |

**Additional Comments/Assumptions:**

| 1 | High Impact (Tier 1) | 2 | Medium Impact (Tier 2) | 3 | Low Impact (Tier 3) |
|---|---|---|---|---|---|

| Section # & Req.ID | Final Inspection | Complies? | Comments/Assumptions |
|---|---|---|---|
| C402.5 [FI55][1] | Building envelope contains a continuous air barrier that has been tested and deemed to limit air leakage <= 0.40 cfm/ft2. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | Requirement will be met.<br>**Location on plans/spec:** See plans and specifications. |
| C402.5.6 [FI37][1] | Weatherseals installed on all loading dock cargo door openings and provide direct contact along the top and sides of vehicles parked in the doorway. | ☐Complies<br>☐Does Not<br>☐Not Observable<br>☐Not Applicable | **Exception:** Requirement does not apply. |

**Additional Comments/Assumptions:**

| | | | | | |
|---|---|---|---|---|---|
| 1 | High Impact (Tier 1) | 2 | Medium Impact (Tier 2) | 3 | Low Impact (Tier 3) |

ATTACHMENT C

PROJECT LABOR AGREEMENT

# PROJECT LABOR AGREEMENT

# COVERING CONSTRUCTION OF

# THE TOWN OF MONTGOMERY

# POLICE STATION

February 3, 2025

THE TOWN OF MONTGOMERY POLICE STATION

PROJECT LABOR AGREEMENT

PREAMBLE


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## PROJECT LABOR AGREEMENT

### PREAMBLE

**WHEREAS,** THE TOWN OF MONTGOMERY, a municipal corporation of the State of New York, having offices at 110 Bracken Road, Montgomery, New York 12549 (the "Town" or Owner") desires to provide for the cost efficient, safe, quality, and timely completion of THE TOWN OF MONTGOMERY POLICE STATION CONSTRUCTION PROJECT (the Project") in a manner designed to afford the lowest reasonable costs to the Town, and the advancement of permissible statutory objectives;

**WHEREAS,** the Town engaged Arace & Company Group ("Erace") to undertake a study of which a copy is on file with the Town of whether the use of a Project Labor Agreement will best serve THE TOWN OF MONTGOMERY'S interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, and other considerations such as the impact of delay, the possibility of cost saving advantages, utilizing local labore and other relevant factors; and

**WHEREAS,** the Arace report dated February 3. 2025, (the "Study"), concluded that use of a Project Labor Agreement would provide the Town with measurable economic benefits and would promote the Town's interest in obtaining the best work at the lowest prices as well as preventing favoritism, fraud and corruption; and

**WHEREAS,** the Town has carefully reviewed and considered the Study and determined, among other things, that the Town's interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, obtaining cost savings advantages, and gaining measurable management flexibility and benefits are best met by utilizing a Project Labor Agreement and, therefore, determines that a Project Labor Agreement be made part of the Project; and

**WHEREAS,** this Project Labor Agreement will foster the achievement of these goals, inter alia, by:

(1) expediting the construction process and otherwise minimizing the disruption to the project;

(2) standardizing the terms and conditions governing the employment of labor on the project;

(3) permitting flexibility in work scheduling where necessary at affordable pay rates;

(4) permitting adjustments to work rules and staffing requirements from those which otherwise might apply;

(5) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

(6) promoting work opportunities for those within the Town and surrounding areas.

(7) ensuring a reliable source of skilled and experienced labor; and

**WHEREAS,** the Town has, through independent investigation and analysis, determined the likelihood of substantial cost savings to the Project will result from the application of this Agreement; and

**WHEREAS, the** Hudson Valley Building & Construction Trades Council, and its affiliated Local Unions and their members, desire to provide for stability, security and work opportunities which are afforded by a Project Labor Agreement; and others; and

**WHEREAS,** the Parties desire to maximize project safety conditions for both workers and others;

**NOW, THEREFORE,** the Parties enter into this Agreement:

# I. ARTICLE 1- PARTIES TO THE AGREEMENT

## SECTION 1.1 PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into for all Project construction, as defined herein, as part of the Project (as defined below) between (1) the Town (2) Hudson Valley Building and Construction Trades Council ("Council") on behalf of itself and its affiliated Local Unions ("Local Unions"); and the signatory Local Unions on behalf of themselves and their members.

# II. ARTICLE 2 - GENERAL CONDITIONS SECTION

## SECTION 2.1 DEFINITIONS

Throughout this Agreement:

(A) **"Contractor(s)"** means any contractor and subcontractors of whatever tier engaged in Project Work within the scope of this Agreement as defined in Article 3, subject to exclusions defined in Section 3.3; 20.3 and 20.4. Notwithstanding the foregoing, it is understood that the Town shall engage only one (1) Prime Contractor.

(B) **"Council"** means the Hudson Valley Building & Construction Trades Council, AFL-CIO.

(C) **"Local Union(s)"** means the Local Unions signatory to this Agreement, individually and collectively.

(D) **"Owner"** means THE TOWN OF MONTGOMERY.

(E) **"Owner's Representative"** means any Construction Manager, Town Engineer, or other individual or entity designated by the Owner to enter into this Agreement or otherwise act on its behalf.

(F) **"The Project"** means the work to be performed in connection with all construction associated with THE TOWN OF MONTGOMERY POLICE STATION PROJECT at 110 Bracken Road as more fully set forth in Article 3, Section 3.1, subject to exclusions defined in Sections 3.3, 20.3 and 20.4.

(G) **"Project Work"** means the work covered by this Agreement and fully defined in

Article 3, Section 3.1, subject to exclusions defined in Section 3.3; 20.3 and 20.4.

(H) **"Schedule A"** means and refers to collective bargaining agreements of affiliated Local Unions.

(I) **"Union Parties"** and **"Unions"** means the Hudson Valley Building & Construction Trades Council, AFL-CIO and the signatory Local Unions to this Agreement, individually and collectively.

**SECTION 2.2 CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE**

This Agreement shall not become effective unless each of the following conditions are met: (1) the Agreement is signed by the Council and the Local Unions having jurisdiction over the Project Work; (2) the Agreement is approved by the NYS Building & Construction Trades Council (NYSBCTC); (3) the Agreement is approved by the NABTU; (4) the Agreement is authorized by the Montgomery Town Board.

**SECTION 2.3 ENTITIES BOUND & ADMINISTRATION OF AGREEMENT**

This Agreement shall be binding on all signatory Unions and their affiliates and all Contractors performing Project Work as defined in Article 3, subject to exceptions in Sections 3.3, 20.3 and 20.4. The Contractors shall include in any subcontract that they let for performance during the term of this Agreement a requirement that their Subcontractors, of whatever tier, become bound by this Agreement with respect to that subcontracted Project Work performed within the scope of Article 3, and require that each Subcontractor, of whatever tier, sign a Letter of Assent (Schedule B). This Agreement shall be administered by the Designee named by the Owner pursuant to Schedule C.

**SECTION 2.4 SUPREMACY CLAUSE**

This Agreement, together with the local Collective Bargaining Agreements appended hereto and referred to herein as "Schedule A" represents the complete understanding with respect to the Project and supersedes any national agreement, local agreement, or other collective bargaining agreement of any type which would otherwise apply to Project Work, in whole or in part except that, to the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, and the National Agreement of the International Union of Elevator Constructors (the "National Agreements"), those National Agreements shall apply, except that when Contractor is also a signatory to an agreement listed in Schedule A hereof, Articles 7, 9, and 10 of this Agreement shall prevail over the applicable National Agreement and any Schedule

A agreement. Where a subject covered by the provisions of this Agreement is also covered by a Schedule A agreement, the provisions of this Agreement shall prevail. If this Agreement is silent on any matter addressed in the applicable Schedule A agreement, the Schedule A agreement shall govern. It is understood that by virtue of having become bound by this Project Labor Agreement, the Contractors will not be obligated to sign any other local, area, or national agreement.

**SECTION 2.5 LIABILITY**

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The Contractors, and Subcontractors shall not be liable for any violations of this Agreement by any other Contractor or Subcontractor; and the Council and Local Unions shall not be liable for any violations of this Agreement by any other Union. Notwithstanding the above, every signatory to the Agreement further acknowledges that it will be liable for its own breach, partial breach or otherwise, whether related or not to the breach of another signatory.

**SECTION 2.6 THE BID SPECIFICATIONS**

The Owner shall require in its bid specifications for all Project Work within the scope of Article 3 that all successful bidders and their Subcontractors of whatever tier (unless otherwise excepted under this Agreement) become bound by this Agreement. Every Contractor shall require its Subcontractors, of whatever tier, to execute the Letter of Assent in Schedule B and to become bound by this Agreement.

**SECTION 2.7 AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS**

This Agreement shall be binding on all signatory Unions and their affiliates, and all Contractors, Unions and/or non-Unions performing Project Work, unless otherwise excepted under this Agreement. Unless expressly provided for in this Agreement, this Agreement shall not apply to the work of any Contractor which is performed at any location other than the site of Project Work.

## III. ARTICLE 3 - SCOPE OF THE AGREEMENT

**SECTION 3.1 PROJECT WORK**

This Agreement shall only apply to Project Work as defined in this Article.

Subject to the exclusions in this Article, Project Work means solely that work performed in connection with all construction associated with the Project. Project Work, unless otherwise excepted under Sections 3.3, 20.3 or 20.4, shall include all sitework, utilities, demolition, environmental work, structural and building MEP's and all construction related to the Project:

**SECTION 3.2 TIME LIMITATIONS**

A. To be covered by this Agreement, Project Work must be awarded after the effective date of this Agreement and prior to December 31, 2025

B. This Agreement shall expire upon completion and acceptance by the Owner of the Project.

C. This Agreement may be extended by written mutual agreement of the parties.

**SECTION 3.3 EXCLUDED EMPLOYEES**

Notwithstanding the provisions of Section 3.1 of this Article, the following person/entities are not subject to the provisions of this Agreement even though performing work on or in connection with the Project:

A. Superintendents, supervisors (excluding general and forepersons specifically covered by a craft's Schedule A), engineers, inspectors and testers, quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards (not covered by schedule A) employed by Owner, technicians, non-manual employees, and all professional, engineering (except field surveyors), administrative and management persons;

B. Employees of the Project Owner;

C. Employees and entities engaged in off-site manufacture, modifications, repairs, maintenance, or painting, handling or fabrication of project components, materials, equipment, or machinery except for any local deliveries of materials such as fill, construction debris removal, ready mix, asphalt, concrete and other aggregates which shall be covered under this Agreement.

D. Employees of the Construction Manager, if one, except that performing manual, onsite construction labor who will be covered by this Agreement.

E. Employees engaged in onsite equipment warranty work;

F. Employees engaged in geophysical testing (whether land or water) other than boring for core samples;

G. Employees engaged in laboratory or specialty testing or inspections, unless ordinarily done by a member of a Trade Union;

H. Employees engaged in ancillary Project Work performed by third parties such as electric utilities, gas utilities, telephone companies, and railroads. Utility work provided by gas, electric, and cable companies, which is not performed by utility company employees or entities contracted by a utility company, shall be subject to the terms of this Agreement.

I. Employees and entities engaged in the manufacturing, design, handling or pre-

fabrication of the pre-engineered metal building for the project. Erection of such shall be covered work.

# IV. ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

## SECTION 4.1 PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all craft employees who are performing Project Work within the scope of Article 3 of this Agreement.

## SECTION 4.2 UNION REFERRAL

A The Contractors agree to hire craft employees for Project Work covered by this Agreement through the job referral systems and hiring halls established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement), where those referrals meet the qualifications set forth in items 1, 2, and 4 of subparagraph B. The Unions agree to provide such craft employees (including apprentices) to all Contractors on a non-discriminatory basis. Notwithstanding this, Contractors shall have sole right to determine the competency of all referrals; the number of employees required; and the selection of employees for layoff (subject to Article 5, Section 5.3). In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period after such requisition is made by a Contractor (Saturdays, Sundays and holidays excepted), a Contractor may employ qualified applicants from any other available source. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of craft employees hired for Project Work within its jurisdiction from any source other than referral by the Union. The Local Unions will cooperate with Contractor requests for minority, women, or economically disadvantaged referrals to meet the goals of Article 4, Section 4.4. These workers may be delivered under a "Direct Entry" designation or by use of a Department of Labor waiver.

B. A Contractor may request by name, and the Local Union will honor, referral of persons who have applied to the Local Union for Project Work and who meet the following qualifications:

(1) Possess any license required by New York State law for the Project Work to be performed;

(2) Have worked a total of at least 1000 hours in the construction craft during the prior two years, and

(3) Were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award.

(4) Have the ability to safely perform the basic functions of the applicable trade.

(5) Have not committed a felony or misdemeanor, or other violation that would render such person unfit to work on Town property.

C. ~~With the exception of specialty work as described in schedule C~~, no more than twelve and a half (12.5%) per centum of the employees covered by this Agreement, per Contractor by craft, shall be hired through the provisions of Paragraph B of this section (any fraction shall be rounded to the next highest whole number). Craft forepersons and/or general forepersons shall be included in these twelve and a half (12.5%) percent. If requested by the appropriate Union, a Contractor utilizing this provision for by- name referrals shall furnish the Union with a written certification that the individuals requested for referral meet the requirements of (1) - (5) above. The 12.5% as above shall be 50% for specialty work as described in Schedule C.

D. The Local Unions shall exert their utmost efforts to recruit sufficient numbers of skilled craft workers to fulfill the manpower requirements of the Contractor. When a Contractor of any tier is contracted to perform Project Work and such Contractor is not signatory to a Schedule A agreement (not including signatory through this Agreement) and the Union cannot provide ample labor to support the construction schedule or project, then the Contractor shall hire outside the Union hiring halls and the Contractor shall, at their discretion, replace the non-Union or non- dispatched employee when notified by the Union that labor has become available through the Union. The Contractor shall use other employees affiliated with the Council before hiring except, where specifically addressed in this Agreement if those employees from the other Unions have the required trade skills to perform the Project Work. Those hired through this provision shall be laid off before those of an affiliated Union.

E. Notwithstanding the foregoing, the Town or a representative of, shall have the sole discretion to request that a person be removed from working on this Project.

**SECTION 4.3 NON-DISCRIMINATION IN REFERRALS**

A The Local Unions represent that their hiring halls and referral systems shall be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of Union membership, policies, or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated

against by any referral system or hiring hall because of the applicant's Union membership, or lack thereof.

### SECTION 4.4 WORKFORCE DIVERSITY UTILIZATION

The Unions recognize and acknowledge that workforce diversity of minorities and women are employment goals consistent with our values of fair play. The Local Unions agree and will strive to utilize their best efforts to provide qualified minority and female applicants.

### SECTION 4.5 CROSS AND QUALIFIED REFERRALS

The Local Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions shall exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of each Contractor.

### SECTION 4.6 UNION DUES

Nothing in this Agreement requires employees to join a Union or pay dues or fees to a Union as a condition of working on the Project. This Agreement is not, however, intended to supersede independent requirements in applicable Local Union Agreements as to Contractors that are otherwise signatory to those Agreements in relation to employees of such Contractors performing Project Work.

## V. ARTICLE 5 - UNION REPRESENTATION

### SECTION 5.1 LOCAL UNION REPRESENTATIVE

Each Local Union signatory to this Agreement shall be entitled to designate a representative and/or Business Manager who shall be afforded access to the Project site only during times when Project Work is being conducted.

### SECTION 5.2 STEWARDS

A Each Local Union shall have the right to designate from among those referred to the Project a working journey person as a Steward or Lead Engineer per shift, and shall notify the Construction Manager or Clerk of Works if applicable, or general contractor, of the identity of the designated Steward or Lead Engineer (and alternate) prior to the assumption of such duties. Stewards or Lead Engineer shall not exercise supervisory functions and shall receive the rate of pay for their craft classifications. There will be no non-working Stewards or Lead Engineer on the Project.

B. In addition to his/her work as an employee, the Steward or Lead Engineer shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor; such activities, however, are not to interfere with the Steward's work unless an emergency situation exists. Each Steward or Lead Engineer shall be concerned with the employees of the Steward's Contractor and, if applicable, Subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor will not discriminate against the Steward or Lead Engineer in the proper performance of Union duties.

C. Requirements for stewards or lead engineer shall be as per the applicable Schedule A agreement.

**SECTION 5.3 LAYOFF OF A STEWARD**

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward or Lead Engineer, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A agreement, such provisions shall be recognized to the extent the Steward or Lead Engineer possesses the necessary qualifications to perform the Project Work required. In any case in which a Steward or Lead Engineer is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

**SECTION 5.4 UNION STANDARDS**

A The Council and its affiliates have a legitimate interest in preventing the undermining of the work opportunities and standards gained through collective bargaining and desire to preserve and protect work opportunities for its members.

B. The Town, while recognizing this interest, must maintain its ability to utilize the services of off-site fabricators and those entities involved in deliveries of construction materials, except those materials included m Section 3.3, when not covered under New York State Labor Law 220.

C. While the scope of the Agreement is limited to Project Work as defined and subject to exceptions herein, Contractors may, whenever economically feasible, make reasonable efforts to use Union signatory vendors, which includes, but not limited to, UA Yellow Label and SMW Blue Label products for off-site assemblies or fabrications.

D. This Section does not refer to construction material normally purchased pre-assembled or manufactured, it references Project Work normally and historically done on-site or in Local Union fabrications shops.

E. If any dispute should arise with respect to this Section, the Contractors agree to install any off-site assemblies or fabricated items regardless of the source. The parties shall endeavor to settle such dispute in the Labor Management forum or

appropriate sub-committee before a grievance is filed under Article 9.

# VI. ARTICLE 6 - MANAGEMENT RIGHTS

## SECTION 6.1 RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their operations including, but not limited to: the right to direct the Project Work force, including determination as to the number to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment and schedule of Project Work; the promulgation of reasonable Project Work rules; and the requirement, timing and number of employees to be utilized for overtime Project Work. Nothing contained herein shall be construed so as to allow direction of an Employee to perform Project Work outside the jurisdiction of that Employee's Labor Union affiliation, if any. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual (as determined by the Contractor) and/or joint working efforts with other employees shall be permitted or observed.

## SECTION 6.2 MATERIALS, METHODS & EQUIPMENT

A There shall be no limitation or restriction upon the Owner's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials, tools, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such Project Work pursuant to an applicable collective bargaining agreement, unless the Local Unions are unable to provide the required skilled craft workers; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-off or testing of specialized or unusual equipment or facilities as designated by the Contractor.

# VII. ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS SECTION

## SECTION 7.1 NO STRIKES-NO LOCK OUT

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, demonstrations, or other disruptive activity on Project Work site for any reason by any signatory to this Agreement. There shall be no Union or concerted or employee activity which disrupts or interferes with the Project Work. Should any employee breach this provision, the Local Unions will use their best efforts to immediately end the breach and return all employees to work. There shall be no lockout by any signatory to this Agreement, unless the disruptive activity continues for more than one (1) working day.

## SECTION 7.2 DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 7.1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 working days.

## SECTION 7.3 NOTIFICATION

If a Contractor contends that any Union has violated this Article, it shall notify the Council of such fact, with copies of the notification to the Local Union involved. The Council and Local Union shall instruct, order, and otherwise use their best efforts to cause the employee(s) to immediately cease and desist from any violation of this Article. The Council shall not be liable for the unauthorized acts of a Local Union or its members. Similarly, a Local Union and its members shall not be liable for any unauthorized acts of its members, the Council, or another Local Union.

## SECTION 7.4 EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 7.1 of this Article or Section 8.3(D)(2) of Article 8 may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

A A party invoking this procedure shall notify **J.** Pierson, Neal M. Eiseman and Thomas Hines, who shall alternate as Arbitrator under this expedited arbitration procedure. If the Arbitrator next on the list is not available to hear the matter within 24 hours of notice, the next Arbitrator on the list shall be called. Copies of such notification will be simultaneously sent to all parties (the alleged violator, the Council, the Local Union, the Contractor, and the Owner).

B. The Arbitrator shall hold a hearing within 48 hours of receiving the notice invoking the procedure if it is contended that the violation still exists. The Arbitrator shall provide at least 24 hours' notice (excluding Sundays and holidays) to all parties as to time and place of the hearing.

C. All notices pursuant to this Article must be delivered to all parties (Local Union, Council, Contractor, alleged violator, and Owner) in writing and may be provided by hand delivery, fax, email, or confirmed overnight delivery. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case and conduct their cross examination) unless otherwise agreed. A failure of any party to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. (i) Section 7.1 hearings:

The sole issue at the hearing shall be whether a violation of Section 7.1 occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease-and- Desist Award restraining such violation and serve copies on all parties. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages (any damages issue is reserved solely for court proceedings, if any). The Award shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

(ii) Section 8.3(D)(2) hearings:

The sole issue at the hearing shall be whether a violation of Section 8.3(D)(ii) occurred. If a violation is found to have occurred, it shall be prima facie evidence of intentional mis-assignment, and the Arbitrator shall issue an immediate stop- work order with respect to the Project Work involved and reassign the Project Work as necessary. The Arbitrator is also authorized to a award damages or back pay in order to make the aggrieved trade whole.

E. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to all parties. In any court proceeding to obtain a temporary or preliminary order enforcing the Arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceeding may be commenced by order to show cause. Such agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.

F. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

G. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

## SECTION 7.5 ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article *9* shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 7.1, above,

may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 7.1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

# VIII. ARTICLE 8 - LABOR MANAGEMENT COMMITTEE

## SECTION 8.1 SUBJECTS

The Project Labor Management Committee ("Committee") will meet as established by the Committee to: 1) promote harmonious relations among the Contractors and Unions; 2) enhance safety awareness, cost effectiveness and productivity of construction operations; 3) protect the public interest; 4) discuss matters relating to staffing and scheduling with safety and productivity as considerations; 5) review Affirmative Action and equal employment opportunity matters pertaining to the Project, if any and increase work opportunity within the Town for Town residents.

## SECTION 8.2 COMPOSITION

The Committee shall be jointly chaired by a designee of the Owner and the Council. It may include representatives of the Local Unions and Contractors involved in the issues being discussed. The Committee may conduct business through mutually agreed upon sub-committees.

## SECTION 8.3 PRE-JOB CONFERENCE

A So that the start and continuation of Project Work may progress without interruption, the Committee shall require each Contractor and Subcontractor of whatever tier to conduct a pre-job conference with the Council and Owner's Representative prior to commencing work. The Construction Manager or General Contractor shall be advised in advance of such conferences and may participate if they wish. This pre-job conference with the Council is in addition to any pre-job/pre-construction conferences required by the Project Contract Documents.

B. The purpose of the pre-job conference with the Council and Owner's Representative shall be for the parties to gain an understanding of each Contractor's proposed work assignments, the standard work day and work week, the number of employees to be employed, the method of referral, the applicable wage rates and fringe benefit contributions and any other matters in accordance with this Agreement.

C. Proposed Trade Assignments. In conjunction with the pre-job conference with the Council required by this Section, each Contractor shall fill out the attached Schedule D- Proposed Trade Assignments identifying all Subcontractors and indicating what trades will be used to perform the Project Work. This form shall be submitted to the Council at least fourteen (14) days in advance of the commencement of Project Work. If any Local Union(s) objects to or disagrees

with the Proposed Trade Assignment of either the Contractor or Subcontractor, the Local Union will state its objection within three (3) days of the submission of the Proposed Trade Assignments and there shall be a good faith discussion among the Contractor or Subcontractor and the objecting Local Union and other affected Unions and Owner's Representative to resolve the matter. If no resolution is reached, any involved Local Union may submit their objection position in writing, together with support documentation, within seven (7) calendar days of the submission of the Proposed Trade Assignments to the Contractor or Subcontractor with a copy to all affected Local Unions. Failure of any objecting Local Union and/or other affected Unions to timely object or submit such objection positions in writing waives any objection to the Proposed Trade Assignments. The Contractor or Subcontractor will review all submitted supporting documentation regarding the Proposed Trade Assignments and will submit to the Construction Manager and/or Owner's Representative, the Council, and all affected Local Unions a "Final Trade Assignment" letter within fourteen (14) days calendar days of the pre-job meeting at which the Proposed Trade Assignments were made.

D. Disputes and Violations.

(I) Unresolved disputes concerning trade assignments shall be handled in accordance with Section 1 0.1, 1 0.2, and 1 0.3 of Article IO in accordance with the National Plan for Settlement of Jurisdictional Dispute in the Construction Industry established by the Building and Construction Trades Department, incorporated by reference in Schedule C, provided however, that disputes concerning intra-trade assignments (assignments between trades within the same International Union) will be determined by the applicable International Union.

(2) Contractor's failure to conduct a pre-job conference with the Council, failure to include all required parties in a pre-job conference with the Council, or failure to adhere to agreed-upon Schedule E trade assignments is a violation of this Agreement and prima facie evidence of intentional mis- assignment. Alleged violations of this provision shall be considered a lock- out and subject to the expedited arbitration procedures of Article 7, Section 7.4.

(3) All remaining unresolved issues shall be subject to the provisions of Article 9.

# IX. ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE

## SECTION 9.1 CLOSE COOPERATION

The Contractors, Unions, and employees, collectively and individually, realize the importance to all parties to maintain continuous and uninterrupted performance of Project Work and agree to resolve disputes in accordance with the grievance-arbitration provisions set forth in

this Article.

**SECTION 9.2 PROCEDURE**

Any question, dispute or claim arising during the term of this Agreement involving the interpretation or application of this Agreement (other than jurisdictional disputes and alleged violations of Section 7.1, and Section 8.3(0)(2)), shall be considered a grievance and shall be resolved pursuant to the following procedure.

Step 1:

A When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall give notice of the claimed violation to the Local Union representative or job steward, who shall notify the Project Work site representative of the involved Contractor and the Construction Manager or Clerk of Works. To be timely, such notice must be in writing given within 7 calendar days after the act, occurrence or event giving rise to the grievance. Strict compliance with this 7-day notice is a condition precedent to proceeding with such grievance. The Local Union representative or the job steward shall meet with the Project Work site representative of the involved Contractor and the Construction Manager or Clerk of Works, if applicable, and endeavor to adjust the matter within 7 calendar days after timely notice has been given. The representative of the involved Contractor shall keep the minutes of the meeting and shall respond to the Union representative in writing, with copy to the Construction Manager or Owner's Representative, within twenty-four (24) hours after the conclusion of the meeting. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, and the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved, unless the settlement is accepted in writing by the Labor-Management Committee as creating a precedent with respect to Project Work.

B. Should any signatory to this Agreement have a dispute [excepting jurisdictional disputes and alleged violations of Section 7.1 or Section 8.3(D)(i) or (ii) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 7 calendar days, the dispute may be reduced to writing and the grieving party may proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

Upon timely receiving a written grievance, the involved Contractor shall notify and

schedule a meeting with the Business Manager of the involved Local Union, the Council, and the Construction Manager or Owner's Representative, if applicable, and their respective representatives, for the purpose of arriving at a satisfactory settlement. Such meeting shall be held within 7 calendar days of the involved Contractor's receipt of the written grievance. Meeting minutes shall be kept by the Contractor with copies to the parties within twenty-four (24) hours.

Step 3:

A If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 21 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants, including the Construction Manager) along with copies of the minutes from Step 1 and Step 2, to the acting Arbitrator under this procedure alternating between **J.** Pierson, Roger Moyer and Thomas Hines. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union, and employees, and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union.

B. Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the Construction Manager, if applicable, the involved Contractor, and the involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

C, Nothing contained herein shall trigger the right of any Local Union or Union employee to engage in any type of strike, work stoppage or disruption regardless of the status of any grievance.

# X. ARTICLE 10 - JURISDICTIONAL DISPUTES

## SECTION 10.1 ASSIGNMENT

The assignment of Project Work shall be solely the responsibility of the Contractor performing the Project Work involved, subject to the pre-job conference with the Council and the procedures set forth in Section 8.3(C), and such Project Work assignments shall be in accordance with the National Plan for the Settlement of Jurisdictional Disputes in the Construction Industry ("National Plan"), incorporated by reference into Schedule C, or any successor Plan approved by the Building & Construction Trades Department, AFL-CIO. Where local memorandums of understanding or agreements between trades are in place they shall apply.

### SECTION 10.2 PROCEDURE FOR SETTLEMENT OF JURISDICTIONAL DISPUTES

All jurisdictional disputes involving Project Work shall be settled according to the National Plan, provided however, that disputes concerning intra-trade assignments (assignments between trades within the same International Union) will be determined by the applicable International Union.

### SECTION 10.3 NO DISRUPTIONS

There will be no strikes, work stoppages, or slowdowns, arising out of any jurisdictional dispute. Pending the resolution of the dispute, the Project Work shall continue uninterrupted and as assigned by each Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

### SECTION 10.4 AWARD

Any jurisdictional award pursuant to this Article shall be final and binding on the disputing Unions and the involved Contractor on this Project only and may be enforced in any court of competent jurisdiction. Such award or resolution shall not establish a precedent on any other construction work not covered by this Agreement.

### SECTION 10.5. LIMITATIONS

Awards made under this Article shall determine only to whom the disputed Project Work belongs. The deciding person or group hereunder shall have no authority to (a) assign Project Work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the Project Work involved; (b) assign work to employees who are not qualified to perform the work involved; or (c) assign Project Work being performed by non-Union employees to Union employees. This provision does not prohibit the establishment, with the agreement of the involved Contractor, of composite crews where more than one (1) employee is needed for the job.

## XI. ARTICLE 11 - WAGES AND BENEFITS

### SECTION 11.1 CLASSIFICATION AND HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the wage rates applicable for those classifications as required by the Schedule A applicable to the work. The term "straight time" in this Agreement shall mean the hourly wage rate applicable for those classifications as required by the applicable New York State Labor Law Section 220 ("Section 220") prevailing wage determination.

### SECTION 11.2 EMPLOYEE BENEFITS

A Unless expressly provided differently in this Agreement, Contractors agree to pay employee benefits/supplements on behalf of all of their employees covered by this Agreement in the amounts required by the applicable Section 220 schedule in effect. Except as provided herein, the Contractors agree that such payments shall be made to those established jointly trusteed employee benefit funds designated in the applicable Schedule A agreement, and in the amounts so designated, to the extent such payments are required by and satisfy the Section 220 obligation. Bona fide jointly trusteed fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if they similarly fall within Section 220. Contractors not otherwise contractually bound to do so, shall not be required to contribute to non-Section 220 benefits, trusts or plans; however, this provision does not relieve Contractors which are signatory to local collective bargaining agreements with any Local Union from complying with the benefit requirements for all funds contained in those collective bargaining agreements.

B. Notwithstanding Section 1 1.2(A):

(1) Contractors who designate employees pursuant to Article 4 may satisfy the above benefits obligation with respect to those employees by: (1) providing those employees with coverage under their private benefit plans for health, welfare, pension, annuity and 401(k); or (2) paying the full amount of such benefit to the employee in employees' wages. The total benefit payments to be made on behalf of each such employee must equal the total Section 220 benefit/supplement amount. If the Contractor's contribution into the private benefit plan for the above funds is less than the amount required by Section 220, the difference must be paid to the employee in cash. Payments of other benefits covered under Section 220 shall be paid to the respective Unions on behalf of each employee.

(2) This same option shall apply with respect to any other employee who is referred to the Contractor through the hiring hall process provided such employee was previously employed by the Contractor and was a participant in a bona fide private benefit plan maintained by the Contractor which satisfies the requirements of Section 220.

(3) The option for a private plan equivalent supplement shall not apply to contributions into Joint Apprentice Training Committee (JATC), or similar apprentice funds designated in the applicable Schedule A agreement, if the Contractor does not have an apprentice training program approved by the Department of Labor (However, all Contractors with contracts for this Project in excess of $500,000 must participate in apprenticeship training programs pursuant to New York State Labor Law §222(2)(e)). Upon request by the Council, any Contractor providing coverage under this provision will provide the Council with documentation of benefit payments made to individual employees during the term of their

employment on the Project.

(4) Contractors who exercise the option under Section I 1.2(B) of this Article to pay into their own private benefit plans rather than the applicable jointly trusteed funds designated in the applicable Schedule A agreement shall be responsible for and guarantee employee benefit/supplement payments and shall indemnify and hold harmless the jointly trusteed funds designated in the applicable Schedule A agreement against any and all benefit/ supplement claims by its employees.

C. Contractors who contribute to jointly trusteed funds under this Section agree to be bound by the written terms of the legally-established jointly trusteed Trust agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such trust funds but only with regard to Project Work done and only for those employees for whom this Agreement requires such benefit payments. Notwithstanding the foregoing, a Contractor's liability shall be at all times limited to the amount of contributions required to be made to the Trust Funds.

D. Each Contractor shall be responsible for and guarantee the payment of all required fringe benefits on the Project. The Local Unions and/or the Council shall notify the General Contractor whenever a Contractor or Subcontractor fails to make a required benefit payment and such delinquency remain outstanding after 30 days. Notification must be in writing and may be by email. If written notice of such a delinquency is received by the General Contractor within 7 days it shall withhold from any funds due to the delinquent Contractor the amount of that delinquency, up to the total amount due, until any dispute regarding the delinquency has been resolved. The General Contractor shall have no other obligation with respect to contributions owed by any Contractor (or its Subcontractor); but that each Contractor shall continue to be obligated with respect to contributions based on Project Work done by that respective Contractor. If notice of a delinquency is not received by the Construction Manager or Clerk of Works within the required time periods, Owner shall have no basis upon which to withhold, with respect to that delinquency, any part of a payment which is otherwise due. General Contractor shall require **Contractors to submit proof of benefit payment with pay request.** The council will notify the Town of Montgomery supervisor if the General contractor is delinquent on benefits and the Town will hold the delinquent amount.

# XII. ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

## SECTION 12.1 WORK WEEK AND WORKDAY

A Unless otherwise provided for in this Agreement, the standard work week shall be five days, Monday through Friday, eight hours per day plus½ hour unpaid lunch period each day. The starting time for the standard work week shall start at either 6:00 a.m., 6:30 a.m., 7:00 a.m., 7:30 a.m. or 8:00 a.m. Multiple starting times shall be allowed.

R Four-tens: notwithstanding any other provision of the Agreement, when working a four-day work week, the work shall consist of 4 days, Monday through Thursday, ten hours per day plus ½ hour unpaid lunch period at the straight time rate. The starting time for four-tens shall be 6:00 a.m. 6:30 a.m. 7:00 a.m. A three-day minimal notice shall be required for four-tens to the respective involved Unions.

C On a 5-day work week, Saturday may be used as a make-up day at straight time to fulfill the 40-hour work week due to inclement weather. On a 4-day work week, Friday may be used as a make-up day at straight time to fulfill the 40-hour work week. Make-up days shall be scheduled for a minimum of 8 hours, except in the case of inclement weather in which Section 12.5 shall apply. This minimum shall also apply when more than one shift or multiple shifts are worked.

D. The changing of the regular starting time, except in the case of overtime and the switch from a 5- day and 4-day work weeks shall be a 4-week minimum.

## SECTION 12.2 OVERTIME

Overtime pay for hours outside of the standard work week and work day, defined in Section 12.1, and all work on Saturdays shall be paid at time and one half the hourly rate and benefits will be paid on straight time. All work on Sundays shall be paid at two times the hourly rate and benefits will be paid at straight time.

## SECTION 12.3 SHIFTS

A Flexible Schedules - Scheduling of shift work, including Saturday and Sunday work, shall be within the discretion of the Contractor in order to meet Project Work schedules and existing Project Work conditions. Shifts must have prior approval of the Construction Manager or Clerk of Works and Owner and must be scheduled with not less than three work days' notice to the Local Union.

B. Second and/or Third Shifts - Saturday and/or Sunday Work.

The second shift shall start between 3 p.m. and 6 p.m. and the third shift shall start between 11 p.m. and 2 a.m. Shift differentials shall be straight time plus fifty percent (50%) of the applicable Schedule A agreement shift differential. No other premium or payments for such work shall be required unless such work is in excess of 40 hours during the week. There shall be no reduction in hours worked on a second and/or third shift, except that when 3 shifts are working together, the length of one or more shifts can be reduced to accommodate a 24- hour day and only actual hours worked will be paid. Work performed on Saturdays or Sundays shall be paid as provided in the applicable Schedule A Agreement.

C. To clarify above, Schedule A Shift Differential designated percentage rates vary according to each trade's prevailing Collective Bargaining Agreement. Shift work as part of this Project Labor Agreement is 50% of the designated percentage of the shift percentages of each trade, for example if a trade's shift differential is 15% it would be 7.5%.

**SECTION 12.4 HOLIDAYS**

A Schedule - There shall be seven (7) recognized holidays:

- New Year's Day,
- President's Day,
- Memorial Day
- Fourth of July
- Labor Day
- Thanksgiving Day
- Christmas Day

All said holidays shall be observed on the dates designated by New York State Law. In the absence of such designation, they shall be observed on the calendar date, except that holidays which occur on Sunday shall be observed on the following Monday and holidays which occur on a Saturday shall be observed on the previous Friday.

B. Payment-Regular holiday pay, if any, for work performed on a recognized holiday shall be in accordance with the applicable Schedule A agreement. There will be no benefits paid on holidays unless worked.

C. Exclusivity - No holidays other than those listed in Section 12.4 shall be recognized or observed in relation to holiday pay and benefits.

**SECTION 12.5 REPORTING PAY**

A When on a five-day work week, employees who report to the work location pursuant to a regular schedule and who are not provided with work for whatever reason, shall receive two (2) hours reporting pay, four (4) hours if work starts and eight (8) hours pay if work occurs after the 4th hour except in the case of inclement weather in which hours worked after the four hours shall be paid and when on a four-day work week with a 10-hour day, (3), (4), (5) and (10) shall apply as per the same terms above.

B. When an employee who has completed his or her scheduled shift and has left the Project site is "called out" to perform special work of a casual, incidental, or irregular nature, the employee shall receive pay for actual hours worked at applicable straight time or overtime rates in accordance with this Agreement, but no less than a minimum guarantee of two (2) hours at the employee's straight time rate.

C. When an employee leaves the job or work location of their own volition, is discharged for cause, or is not working as a result of the Contractor's invocation of Section 12.8 below, he or she shall be paid only for the actual time worked.

D. There shall be no pay for time not actually worked except as specifically set forth in this Article 12 and where an applicable Schedule A agreement applies to Forepersons, Stewards and Lead Engineer in reference to pay.

**SECTION 12.6 PAYMENT OF WAGES**

A Payday: Payment shall be made by check, drawn on a New York bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site by 3:00 p.m. on Thursdays. In the event that the following Friday is a bank holiday, paychecks shall be issued on Wednesday of that week. Not more than one week's wages shall be held back in any pay period. Paycheck stubs shall contain the name and business address of the Contractor, together with an itemization of deductions from gross wages.

B. Termination: Employees who are laid off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractor shall also provide the employee with a written statement setting forth the date oflayoff or discharge.

**SECTION 12. 7 INJURY/DISABILITY**

An employee who, after commencing Project Work, suffers a work-related injury or disability while performing Project Work duties, shall receive no less than eight (8) hours wages for that day. Further, the employee shall be rehired at such time as the employee is able to return

to duties provided there is still Project Work available for which the employee is qualified and able to perform.

### SECTION 12.8 EMERGENCY WORK SUSPENSION

A Contractor or Owner may, if considered necessary for the protection of life, property, and/or safety of employees or others, suspend all or a portion of Project Work. In such instances, employees shall be paid for actual time worked; provided however, that when a Contractor requests that employees remain at the job site available for Project Work, employees shall be paid for "stand- by" time at their hourly rate of pay.

## XIII. ARTICLE 13 - APPRENTICESHIP & HELMETS TO HARDHATS

### SECTION 13.1 APPRENTICE RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women, and economically-disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such Project Work as is within their capabilities and that is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications as are contained in the applicable Schedule A agreement in a ratio of not less than twenty-five percent (25%) of the work force by craft (without regard to whether a lesser ratio is set forth in the applicable Schedule A agreement), unless the applicable Schedule A agreement provides for a higher percentage. The first person assigned to the job shall be a Journeyman. The second person assigned may be an apprentice. Subsequent assignments shall be Journeymen until the applicable ratio is achieved. This assignment shall be repeated until staffing needs are satisfied. Apprentices and such other classifications as are appropriate will be employed in a manner consistent with the provisions of the applicable Schedule A agreement.

### SECTION 13.2 NYS DEPARTMENT OF LABOR- APPRENTICESHIP

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New York State Department of Labor to ensure that minorities and women are afforded every opportunity to participate in apprenticeship programs that result in the placement of apprentices on this Project.

### SECTION 13.3 NEW YORK HELMETS TO HARDHATS

The Contractors and the Unions desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Contractors and the Unions agree to utilize the services of the Center for Military

Recruitment, Assessment and Veterans Employment (the "Center") and the Center's "New York Helmets to Hardhats" program as a resource for preliminary orientation and assessment of construction aptitude; referral to apprenticeship programs or hiring halls; counseling and mentoring; and support networks, employment opportunities, and other needs as identified by the parties.

The Unions and the Contractors agree to work with the Center to create and maintain an integrated database of veterans interested in working on the Project as well as information about apprenticeship and employment opportunities related to this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

### SECTION 13.4 PARTICIPATION GOALS (MBE, WBE, SDVOB, LABOR SURPLUS AREA)

A T he Town, Contractors, the Hudson Valley Building and Construction Trades Council and its affiliated Unions are committed to meeting federal and New York State Participation Goals, if any are applicable to the Project, and shall be in alignment with the current goals or standards set for by federal or New York State requirements for Minority Business Enterprises (MBE), Woman Owned Business Enterprise (WBE), Service-Disabled Veteran Owned Business (SVDOB), and federal Labor Surplus Area requirements, to ensure participation on the project by MBE, WBE and SVDOB firms and job- seekers from federal Labor Surplus Areas (for 2022, City of Middletown, Town of Monroe, and City of Montgomery) while maintaining fiscal responsibility.

B. Outreach by the General Contractor, if applicable, Contractors, Hudson Valley Building and Construction Trades and affiliated Unions and contractor associations to ensure participation goals of NYS Certified MBE, WBE and SDVOB firms and Labor Surplus Area recruitment are met will be required through the project.

C. Where the above requirements of Section 13.4 do not apply, reference in this section shall not apply.

## XIV. ARTICLE 14 - NO DISCRIMINATION

### SECTION 14.1 COOPERATIVE EFFORTS

The Contractors and Unions agree that they shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, marital status, age, Union or non-Union status, real or perceived sexual orientation or any other status protected by law, in any manner prohibited by law or regulation. It is recognized that special procedures may be established by Contractors and Local Unions and the New York State Department of

Labor for the training and employment of persons who have not previously qualified to be employed on construction projects of the type covered by this Agreement. The parties to this Agreement shall assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project. Nothing in this section shall be grieveable.

### SECTION 14.2 LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including all genders.

## XV. ARTICLE 15 - GENERAL TERMS SECTION 15.1 PROJECT RULES

### SECTION 15.1 PROJECT RULES

A T he Town, the General Contractor and Contractors may establish from time to time such reasonable Project rules as are necessary for the good order of the Project. These rules shall be outlined at the pre-job conference with the Council, detailed in the contract documents, approved by the President of the Council, posted at the Project site, and may be amended thereafter as necessary.

B. Security Protocols - If applicable, with Owner's approval and in its sole discretion, will determine security protocols for the entire Project Site. Strict compliance by all Contractors and subcontractors of all tiers and their respective personnel with security procedures, protocols, and directives issued by these entities or its delegated, is required at all times.

### SECTION 15.2 TOOLS OF THE TRADE

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the Project Work performed. Employees using these tools shall perform any of the Project Work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of Project Work within the employee's jurisdiction.

### SECTION 15.3 SUPERVISION

Employees or other personnel shall work under the supervision of the craft foreperson or general foreperson for the applicable hiring or subcontracting Contractor

### SECTION 15.4 FULL WORKDAY

A Employees shall be at their Project Work area at the starting time established by the Contractor.

B. The signatories to this Agreement reaffirm their policy of a fair day's work for a fair day's wage.

## XVI. ARTICLE 16 - SAFETY PROTECTION OF PERSON AND PROPERTY

### SECTION 16.1 SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA and New York State mandated safety requirements are at all times maintained on the Project and the employees and Unions agree to cooperate fully with these efforts. Employees must perform their Project Work at all times in a safe manner and protect themselves and the property of the Contractor from injury or harm. Failure to do so may be grounds for discipline, including discharge. Prevention of accidents at the site is the responsibility of the Contractors, its employees, subcontractors and suppliers, persons, and entities at the Project Site. The Contractors shall establish their own safety programs implementing safety measures, policies, and standards conforming to those required or recommended by governmental and quasi-governmental authorities having jurisdiction.

### SECTION 16.2 CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Owner. Such rules will be referenced in the Contract Documents and may be distributed to Contractors for further distribution to personnel and/or posted in conspicuous places throughout the Project.

### SECTION 16.3 INSPECTIONS

The Contractors, Owner, Architect/Engineer retain the right to inspect incoming shipments of equipment, apparatus, machinery, and construction materials of every kind.

## XVII. ARTICLE 17 -TEMPORARY SERVICES

Temporary light, power, cooling, ventilation and other services shall only be required on the specific request of a Contractor and when requested shall be assigned in accordance with the Contract Documents. Temporary coverage may be provided by the supplying Contractor's employees already working under this Agreement during regular work hours. The supplying Contractor will determine the need for temporary coverage requirements during non-work hours. For safety reasons, temporary light and power panels will only be accessed by employees of the

Contractor responsible for supplying the temporary light and power panels. Coverage requirements shall not require a standby employee who is not performing Project Work. There shall be no stacking of trades on temporary services. In the event temporary services are claimed by multiple trades, the matter shall be resolved pursuant to Article 10.

# XVIII. ARTICLE 18 - SAVINGS AND SEPARABILITY, GOVERNING LAW AND VENUE

## SECTION 18.1 PARTIAL INVALIDITY

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or is otherwise determined to be in violation of law, the provision involved (and/or its application to a particular part of the Project, as necessary) shall be rendered, temporarily or permanently, null and void, but the remainder of the Agreement shall remain in full force and effect to the extent allowed by law. In the event a court of competent jurisdiction finds any portion of the Agreement to be invalid, the parties will immediately enter into negotiations concerning the substance affected by such decision for the purpose of achieving conformity with the court determination and the intent of the parties hereto for contracts to be let in the future.

## SECTION 18.2 NON-WAIVER

Nothing in this Agreement is intended to be or shall be construed as a waiver by any Union(s) of any prevailing wage determination or schedule that is applicable to their trade for any public work that has been or may be performed in the future on any work outside the scope of this Agreement. Nothing contained in this Agreement is intended to be or shall be construed as a waiver by any Union(s) of any more favorable term or condition of employment that may be contained in any collective bargaining agreement applicable to work outside the scope of this Agreement.

## SECTION 18.3 GOVERNING LAW AND VENUE

The laws of the State of New York shall govern all disputes arising hereunder regardless of conflicts of laws principles. All such disputes shall be resolved in the courts of Orange County, New York, which the parties agree is the proper venue for the adjudication of such disputes.

# XIX. ARTICLE 19 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

## SECTION 19.1 CHANGES TO AREA CONTRACTS

Each Schedule A agreement incorporated by reference into this Agreement by Schedule A shall continue in full force and effect until the Contractor and/or Union parties to the area collective bargaining agreements which are the basis for the applicable Schedule A agreement, notify the

Owner and General Contractor in writing of the agreed upon changes in the Schedule A agreement which is applicable to the Project, and their effective dates. Such changes shall only be effective to the extent consistent with this Agreement. Any disagreement between signatories to this Agreement over the incorporation into Schedule A of provisions agreed upon in the renegotiation of area collective bargaining agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

### SECTION 19.2 LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there shall be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiation of area local collective bargaining agreements, nor shall there be any lock-out on this Project affecting a Local Union during the course of such renegotiations.

## XX. ARTICLE 20 - PROJECT SPECIFIC

### SECTION 20.1 CLEAN UP

A clean work site results in a safe and more productive job site. All cleanup during construction shall be performed by the trade having jurisdiction for cleanup in accordance with the Project Contract Documents. The Owner will ensure a clean and safe workplace. The General Contractor may back charge Contractors accordingly if clean up becomes unsatisfactory.

Once construction is complete and a building, section or floor is turned over to a professional cleaning company for final cleaning, including but not limited to, windows and floor prep, up to 33.3% of the Employees may be a direct employee of the cleaning company. Those direct employees shall be exempt from this Agreement.

### SECTION 20.2 FURNITURE, FIXTURES AND EQUIPMENT (FFE)

Project work related to furniture, fixtures, and equipment that is free standing and requires no onsite assembly and is not fastened, mounted, anchored, hardwired or hard piped to any part of the building structure or surface by glue, screws, nails, mechanical fastener or by any other means is excluded from this agreement. Accordingly, for avoidance of doubt, all unloading, handling, assembly, installation and clean-up of all furniture, fixture, and equipment which requires fastening, mounting, anchoring, hardwiring or hard piped to any part of the building structure or surface by glue, nails, screws, mechanical fasteners, wire, pipe or by other means, or requires any onsite assembly shall be included project work under this agreement.

When the owner, construction manager or general contractor directs or contracts excluded work under this Section (20.4) to be performed this Agreement shall apply.

**IN WITNESS WHEREOF** the parties have caused this Agreement to be executed and effective as of the 12TH day of March 2025.

**FOR THE HUDSON VALLEY BUILDING AND CONSTRUCTION TRADES COUNCIL:**

By: R. Todd D

L. Todd Diorio, President

THE TOWN OF MONTGOMERY:

By: L. Stephen Brescia

L. Stephen Brescia, Supervisor

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**GENERAL PRIME CONTRACTOR:**

By: ----------

Company Name: _____

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## FOR LOCAL UNIONS:

**International Union of Bricklayers and Allied Craftworkers Local NO. 1:**

Signed: Michael J Clifford Title: Field Rep

Email: mclifford@bac1ny.com Phone: 845-224-5761

**International Brotherhood of Boilermakers, Iron Ships Builders, Blacksmiths, Forgers Helpers District NO. 5:**

Signed: Thomas F. Ryan Title: BM-ST

Email: BoilermakersLocal5@verizon.net Phone: 516 326 2500

**Bricklayers and Allied Crafts, Tile, Marble & Terrazzo Union of New York & New Jersey Local NO. 7:**

Signed: Sebastian Varga Title: Field Rep

Email: SVarga@BacLocal7.com Phone: 917-734-7429

~~**Bricklayers**~~ **United Union of Roofers, Waterproofers and Allied Workers Local NO. 8:**

Signed: _____ Title: _____

Email: _____ Phone: _____

**District Council NO. 9, International Unio. of Painters and Allied Trades, A.F.L-C.1.0:**

Signed: _____ Title: **Joseph Azzopardi** **Business Manager/Secretary Treasurer - DC9**

Email: jazzopardi@dc9.net Phone: 212-255-2950 x150

**Laborers International Union of N.A. Local 17:**

Signed: _____ Title: BUSINESS MANAGER

Email: DIORIOJ@HOTMAIL.COM Phone: 914-474-6220

**International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART) Local NO. 38:**

Signed: _____ Title: Business Manager

Email: _____ Phone: 845 891-6754

**International Association of HBAT and Frost Insulators and Allied Workers Local NO. 91:**

Signed: _____ Title: Business Manager

Email: AWL91@insulators.org Phone: (914) 788-0400

**International Union of Elevators (IUEC) Local NO. 138:**

Signed: _____ Title: _____

Email: _____ Phone: _____

**O.P.C.M.I.A. Plasters Union Local NO. 262:**

Signed: _____ Title: Business Manager

Email: Dalleyne@local262.org Phone: (914) 255-8601

**North Atlantic States Regional Council of Carpenters Local NO. 279:**

Signed: Scott J Smith Title: Business Manager

Email: SSmith@nasrcc.org Phone: 845-263-7516

**International Brotherhood of Electrical Workers Local NO. 363:**

Signed: Sam Fratto Title: BUSINESS MANAGER

Email: SFRATTO@IBEWLU363.ORG Phone: 845-216-7023

**Plumbers, Steamfitters & Service Technicians Local NO. 373:**

Signed: Thomas Gandolfini Title: Business Manager

Email: t.gandolfini@ua373.com Phone: 845-206-7564

**International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers Local NO. 417:**

Signed: Matthew P. Stoddard Title: B.M.

Email: matts417@verizon.net Phone: (845) 629-1185

**International Brotherhood of Teamsters Local Union NO. 445:**

Signed: [signature] Title: Vice President

Email: jclairemon@teamstersunion445.org Phone: 845-344-4763

**Road Sprinkler Fitters Union Local NO. 669:**

Signed: _____ Title: Business Agent

Email: Killey669@gmail Phone: 914-475-9158

**New York City District Carpenters Local NO. 740 & Local NO. 2287:**

Signed: _____ Title: _____

Email: _____ Phone: _____

**United Cement Masons Local NO. 780:**

Signed: Dino Salerno Title: Organizer

Email: DSalerno@NOEDC.org Phone: 914-574-3398

**International Union of Operating Engineers Local NO. 825:**

Signed: _____ Title: Business Representative

Email: CWood@iuoe825.org Phone: 908-347-0502

## Schedule A

COLLECTIVE BARGAINING AGREEMENT can be viewed by visiting the Hudson Valley Building and Construction Trades Council website:

| | | |
|---|---|---|
| BuildItUnion.org | Username: | hudsonvalley |
| | Password: | buildingtrades |

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTORS TO VERIFY SCHEDULE A AGREEMENTS WITH THE RESPECTIVE UNIONS SIGNATORY TO THE PROJECT LABOR AGREEMENT.

For questions about this agreement or Schedule A contact:

Todd Diorio: (845) 565-2737 or email: tdiorio555@aol.com
President, HVBCTC

## Schedule B – Letter of Assent

The undersigned party confirms that it agrees to be a party to and be bound by THE TOWN OF MONTGOMERY POLICE STATION PROJECT PROJECT Project Labor Agreement hereinafter agreement or PLA entered into with Hudson Valley Building and Construction Trades Council (Heavy Highway Division) and understands that such Agreement may from time to time, be amended by the parties or interpreted pursuant to its terms. The terms of the Agreement and its Schedules are hereby incorporated by reference herein.

The undersigned as a Contractor or Subcontractor (hereinafter "Contractor") on the project known as THE TOWN OF MONTGOMERY POLICE STATION PROJECT (hereinafter "Project"), for and in consideration of the award to it of a contract to perform work on said Project, and in further consideration of the mutual promises made in the PLA, a copy of which was received and is acknowledged, hereby:

(1) Accepts and agrees to be bound by the terms and conditions of the PLA together with any and all schedules, amendments, and supplements now existing or which are later made thereto;

(2) Agrees to be bound by an incorporates and adopts the legally established collective bargaining agreements ("Schedule A") and local trust agreements as referenced in the PLA and this letter of Assent for this Project;

(3) Authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor;

(4) Certifies that it has no commitments or agreements that would preclude its full in complete compliance with the terms and conditions of said PLA. The Contractor agrees to employ labor that can work in harmony with all other labor on the Project and shall require labor harmony from every lower tier subcontractor it engages to work on the Project. Labor harmony disputes slash issues shall be subject to the Lamor Management Committee's Pre-job conference provisions;

(5) Agrees to secure from and Contractor(s) as defined in said PLA which is or becomes a Subcontractor (of any tier) on the Project, a duly executed Agreement to be bound from identical to this document:

(6) Agrees that it will not invoke the Most Favored Nations Clause that may be contained in any of its Collective Bargaining Agreements with affiliated unions as a result of the application of this PLA to this Project.

## Schedule C

The National Plan for the settlement of jurisdictional disputes in the construction industry ("National Plan") can be viewed by visiting the Hudson Valley Building and Construction Trades Council website:

| | | |
|---|---|---|
| BuildItUnion.org | Username: | hudsonvalley |
| | Password: | buildingtrades |

For questions contact:

L. Todd Diorio: (845) 565-2737
President, HVBCTC

## Schedule D – Trade Assignments

The General Contractor and Council will develop a trade assignment form to be used on the Project.

ATTACHMENT D

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Kathy Hochul, Governor

Roberta Reardon, Commissioner

Town of Montgomery

James Farr
110 Bracken Rd
Montgomery NY 12549

| | |
|---|---|
| Schedule Year | 2024 through 2025 |
| Date Requested | 12/12/2024 |
| PRC# | 2024015253 |

| | |
|---|---|
| Location | Town Hall Property |
| Project ID# | |
| Project Type | Construct new Police Station |

## PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Rate Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2024 through June 2025. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

### NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

# General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

## Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

## Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission: a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion online.

## Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

## Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12226; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

## Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemperaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment.Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed $100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds $25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

## Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

## Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

## Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers. compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers. Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

## Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12226 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

## Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

## Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

## Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

## Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b) ).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of $50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c) ).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d) ).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

## Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

## Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.

Kathy Hochul, Governor

Roberta Reardon, Commissioner

Town of Montgomery

James Farr
110 Bracken Rd
Montgomery NY 12549

Schedule Year 2024 through 2025
Date Requested 12/12/2024
PRC# 2024015253

Location Town Hall Property
Project ID#
Project Type Construct new Police Station

## Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

### Contractor Information
All information must be supplied

Federal Employer Identification Number: _____

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Amount of Contract: $_____

Approximate Starting Date: ____/____/____

Approximate Completion Date: ____/____/____

Contract Type:
[ ] (01) General Construction
[ ] (02) Heating/Ventilation
[ ] (03) Electrical
[ ] (04) Plumbing
[ ] (05) Other : _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12226

## Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

## Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to $1,500 for a first offense and up to $5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, https://dol.ny.gov/public-work-and-prevailing-wage
If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov .

## Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

### Effective June 23, 2020

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage and supplement rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website *www.labor.ny.gov* or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(12.20)

**To all State Departments, Agency Heads and Public Benefit Corporations**
**IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

## Budget Policy & Reporting Manual

# B-610

### Public Work Enforcement Fund

*effective date December 7, 2005*

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## 1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

## 2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

## 3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

**To all State Departments, Agency Heads and Public Benefit Corporations**
**IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12226

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.

NEW YORK STATE OF OPPORTUNITY. Department of Labor

Required Notice under Article 25-B of the Labor Law

# Attention All Employees, Contractors and Subcontractors: You are Covered by the Construction Industry Fair Play Act

**The law says that you are an employee unless:**

- You are free from direction and control in performing your job, **and**
- You perform work that is not part of the usual work done by the business that hired you, **and**
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

**It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.**

**Employee Rights:** If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

**Independent Contractors:** If you are an independent contractor**, you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

**Penalties** for paying workers off the books or improperly treating employees as independent contractors:

| | |
|---|---|
| • **Civil Penalty** | First offense: Up to $2,500 per employee<br>Subsequent offense(s): Up to $5,000 per employee |
| • **Criminal Penalty** | First offense: Misdemeanor - up to 30 days in jail, up to a $25,000 fine and debarment from performing public work for up to one year.<br>Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a $50,000 fine and debarment from performing public work for up to 5 years. |

**If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.**

**Employer Name:**

IA 999 (09/16)

WE ARE YOUR DOL

NEW YORK STATE Department of Labor

New York State Department of Labor
Bureau of Public Work

# Attention Employees

**THIS IS A:**

# PUBLIC WORK PROJECT

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Your pay stub and wage notice received upon hire must clearly state your wage rate and supplement rate.

Chapter 629 of the Labor Laws of 2007:

**These wages are set by law and must be posted at the work site. They can also be found at: https://dol.ny.gov/bureau-public-work**

If you feel that you have not received proper wages or benefits, please call our nearest office.*

| | | | |
|---|---|---|---|
| Albany | (518) 457-2744 | Patchogue | (631) 687-4882 |
| Binghamton | (607) 721-8005 | Rochester | (585) 258-4505 |
| Buffalo | (716) 847-7159 | Syracuse | (315) 428-4056 |
| Garden City | (516) 228-3915 | Utica | (315) 793-2314 |
| New York City | (212) 932-2419 | White Plains | (914) 997-9507 |
| Newburgh | (845) 568-5287 | | |

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

# Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is $250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training “prior to the performing any work on the project.”

### The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.)*
- Training roster, attendance record of other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

### WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is $3 million in Bronx, Kings, New York, Queens and, Richmond counties; $1.5 million in Nassau, Suffolk and Westchester counties; and $500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirement s on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

# Introduction to the Prevailing Rate Schedule

### Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

### Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less that six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

### Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

### Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

### Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

### Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

### Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

| Title (Trade) | Ratio |
|---|---|
| Boilermaker (Construction) | 1:1,1:4 |
| Boilermaker (Shop) | 1:1,1:3 |
| Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder) | 1:1,1:4 |
| Carpenter (Residential) | 1:1,1:3 |
| Electrical (Outside) Lineman | 1:1,1:2 |
| Electrician (Inside) | 1:1,1:3 |
| Elevator/Escalator Construction & Modernizer | 1:1,1:2 |
| Glazier | 1:1,1:3 |
| Insulation & Asbestos Worker | 1:1,1:3 |
| Iron Worker | 1:1,1:4 |
| Laborer | 1:1,1:3 |
| Mason | 1:1,1:4 |
| Millwright | 1:1,1:4 |
| Op Engineer | 1:1,1:5 |
| Painter | 1:1,1:3 |
| Plumber & Steamfitter | 1:1,1:3 |
| Roofer | 1:1,1:2 |
| Sheet Metal Worker | 1:1,1:3 |
| Sprinkler Fitter | 1:1,1:2 |

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12226

| District Office Locations: | Telephone # | FAX # |
|---|---|---|
| Bureau of Public Work - Albany | 518-457-2744 | 518-485-0240 |
| Bureau of Public Work - Binghamton | 607-721-8005 | 607-721-8004 |
| Bureau of Public Work - Buffalo | 716-847-7159 | 716-847-7650 |
| Bureau of Public Work - Garden City | 516-228-3915 | 516-794-3518 |
| Bureau of Public Work - Newburgh | 845-568-5287 | 845-568-5332 |
| Bureau of Public Work - New York City | 212-932-2419 | 212-775-3579 |
| Bureau of Public Work - Patchogue | 631-687-4882 | 631-687-4902 |
| Bureau of Public Work - Rochester | 585-258-4505 | 585-258-4708 |
| Bureau of Public Work - Syracuse | 315-428-4056 | 315-428-4671 |
| Bureau of Public Work - Utica | 315-793-2314 | 315-793-2514 |
| Bureau of Public Work - White Plains | 914-997-9507 | 914-997-9523 |
| Bureau of Public Work - Central Office | 518-457-5589 | 518-485-1870 |

## Orange County General Construction

### Boilermaker — 12/01/2024

**JOB DESCRIPTION** Boilermaker **DISTRICT** 4

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

**WAGES**

| Per Hour: | 07/01/2024 | 01/01/2025 |
|---|---|---|
| Boilermaker | $ 67.38 | $ 68.88 |
| Repairs & Renovations | 67.38 | 68.88 |

Repairs & Renovation: Includes Repairing, Renovating replacement of parts to an existing unit(s).

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | | |
|---|---|---|
| Boilermaker<br>Repair & Renovations | 33.5% of hourly<br>Wage Paid<br>+ $ 26.85 | 33.5% of Hourly<br>Wage Paid<br>+ $26.85 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

**OVERTIME PAY**
See (*B, O, **U) on OVERTIME PAGE
Note:* Includes 9th & 10th hours, double for 11th or more.
** Labor Day ONLY, if worked.

Repairs & Renovation see (B,E,Q) on OT Page

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 12, 15, 25, 26, 29) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wage per hour:
(1/2) Year Terms at the following percentage of Boilermaker's Wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|
| 65% | 70% | 75% | 80% | 85% | 90% | 95% |

Supplemental Benefits Per Hour:

| | 33.5% of Hourly Wage Paid Plus Amount Below | 33.5% of Hourly Wage Paid Plus Amount Below |
|---|---|---|
| 1st Term | $ 20.36 | $ 20.36 |
| 2nd Term | 21.28 | 21.28 |
| 3rd Term | 22.22 | 22.22 |
| 4th Term | 23.12 | 23.12 |
| 5th Term | 24.07 | 24.07 |
| 6th Term | 25.00 | 25.00 |
| 7th Term | 25.93 | 25.93 |

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

### Carpenter — 12/01/2024

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Dutchess, Orange

**WAGES**
Per hour: 07/01/2024

Building:
Millwright $ 46.35
+ 8.44*

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

**SUPPLEMENTAL BENEFITS**
Per hour:

Journeyman $ 34.94

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (18, 19) on HOLIDAY PAGE
Paid: See (5,6,11,13,16,18,19,25) for 1st & 2nd yr. Apprentices
Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

**REGISTERED APPRENTICES**
Wages per hour:
One (1) year terms:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 28.18 | $ 30.51 | $ 34.84 | $ 43.50 |
| + 4.40* | + 5.19* | + 5.94* | + 7.44* |

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

Supplemental benefits per hour:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 23.00 | $ 24.79 | $ 26.90 | $ 29.63 |

8-740.2

**Carpenter** **12/01/2024**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Dutchess

**PARTIAL COUNTIES**
Orange: : The territory west demarcated by a line drawn from the Bear Mountain Bridge continuing east to the Bear Mountain Circle. The territory south demarcated by a line continuing north on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W to the centerline of Route 32, The territories south and east heading north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

**WAGES**
Per hour: 07/01/2024

Carpet/Resilient
Floor Coverer $ 34.45
+ 3.25*

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

**SUPPLEMENTAL BENEFITS**
Per hour:
$ 28.33

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (18, 19) on HOLIDAY PAGE
Paid for 1st & 2nd yr.
Apprentices: See (5, 6, 11, 13, 16, 18, 19, 25)
Overtime: See (5, 6, 11, 13, 16, 18, 19, 25) on HOLIDAY PAGE.

**REGISTERED APPRENTICES**
Wage per hour - (1) year terms:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $15.75 | $18.87 | $23.55 | $28.23 |
| + 2.48* | + 2.48* | + 2.48* | + 2.48* |

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

Supplemental Benefits per hour - All apprentice terms:

$ 20.87

8-2287D&O

**Carpenter** **12/01/2024**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**
Per Hour: 07/01/2024

Marine Construction:

| | |
|---|---|
| Marine Diver | $ 75.46 |
| | + 10.00* |
| Marine Tender | $ 55.00 |
| | + 10.00* |

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime

**SUPPLEMENTAL BENEFITS**
Per Hour:

| | |
|---|---|
| Journeyworker | $ 45.65 |

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (18, 19) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 13, 16, 18, 19, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages per hour:
One (1) year terms.

| | |
|---|---|
| 1st year | $ 26.98 |
| | + 5.50* |
| 2nd year | 32.58 |
| | + 5.50* |
| 3rd year | 40.96 |
| | + 5.50* |
| 4th year | 49.35 |
| | + 5.50* |

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

Supplemental Benefits
Per Hour:

| | |
|---|---|
| All terms | $ 32.20 |

8-1456MC

**Carpenter** **12/01/2024**

**JOB DESCRIPTION** Carpenter **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Westchester

**PARTIAL COUNTIES**
Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.
Putnam: South of but including the following, Cold Spring, TompkinsCorner, Mahopac, Croton Falls, east to Connecticut border.
Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

**WAGES**

| Per hour: | 07/01/2024 |
|---|---|
| Core Drilling: | |
| Driller | $ 46.25 |
| | + 3.25* |
| Driller Helper | $ 36.28 |
| | + 3.25* |

Note: Hazardous Waste Pay Differential:
For Level C, an additional 15% above wage rate per hour
For Level B, an additional 15% above wage rate per hour
For Level A, an additional 15% above wage rate per hour
Note: When required to work on water: an additional $ 3.00 per hour.

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

**SUPPLEMENTAL BENEFITS**

| Per hour: | |
|---|---|
| Driller and Helper | $ 30.24 |

**OVERTIME PAY**
See (B, G, P) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

8-1536-CoreDriller

## Carpenter - Building / Heavy&Highway — 12/01/2024

**JOB DESCRIPTION** Carpenter - Building / Heavy&Highway **DISTRICT** 2

**ENTIRE COUNTIES**
Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

**PARTIAL COUNTIES**
Orange: The area lying on Northern side of Orange County demarcated by a line drawn from the Bear Mountain Bridge continuing west to the Bear Mountain Circle, continue North on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W, then east on County Road 107 to Route 32, then north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

**WAGES**

| Wages per hour: | 07/01/2024 |
|---|---|
| Carpenter - ONLY for Artificial Turf/Synthetic Sport Surface | $ 36.48 |

Note - Does not include the operation of equipment. Please see Operating Engineers rates.

**SUPPLEMENTAL BENEFITS**

| Per hour: | |
|---|---|
| Journeyworker | $ 26.55 |

**OVERTIME PAY**
See (B, E, Q, X) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

Notes:
When a holiday falls upon a Saturday, it shall be observed on the preceding Friday. Whan a holiday falls upon a Sunday, it shall be observed on the following Monday.
An employee taking an unexcused day off the regularly scheduled day before or after a paid Holiday shall not receive Holiday pay.

**REGISTERED APPRENTICES**
Wages per hour (1300 hour terms at the following percentage of Journeyworker's wage):

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| 65% | 70% | 75% | 80% |

Supplemental Benefits per hour:

| | | | |
|---|---|---|---|
| $18.58 | $19.14 | $21.24 | $21.79 |

2-42AtSS

## Carpenter - Building / Heavy&Highway — 12/01/2024

**JOB DESCRIPTION** Carpenter - Building / Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**
Columbia, Dutchess, Orange, Sullivan, Ulster

**WAGES**
WAGES (per hour)

Applies to Carpenter (Building/Heavy & Highway/Tunnel), Dockbuilder, Piledriver, Dive Tender, and Diver (Dry):

| | 07/01/2024 | 07/01/2025 Additional | 07/01/2026 Additional |
|---|---|---|---|
| Base Wage | $ 37.19 + 6.31* | $ 2.23** | $ 2.30** |

Applies to Diver (Wet):

| | |
|---|---|
| Base Wage | $ 50.00 + 6.31* |

*For all hours paid straight or premium.
**To be allocated at a later date.

**SHIFT WORK**
SHIFT DIFFERENTIAL: When mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of the base wage.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyworker | $ 30.65 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
BUILDING:
Paid: See ( 1 ) on HOLIDAY PAGE.
Overtime: See ( 5, 6, 16, 25 ) on HOLIDAY PAGE.
- Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:
Paid: See ( 5, 6, 25 ) on HOLIDAY PAGE
Overtime: See ( 5, 6 ) on HOLIDAY PAGE
- Holidays that fall on Sunday will be observed Monday
- Must be employed during the five (5) work days immediately preceding a holiday or during the five (5) work days following the paid holiday to receive holiday pay
- If Employee is entitled to a paid holiday, the Employee is paid the Holiday wage and supplemental benefits whether they work or not. If Employee works the Holiday, the Employee will receive holiday pay (including supplemental benefits), plus the applicable premium wage for working the Holiday. If Employee works in excess of 8 hours on Holiday, then benefits will be paid for any hours in excess of 8 hours.

**REGISTERED APPRENTICES**
1 Year terms at the following wage rates.

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 18.60 +3.09* | $ 22.31 +3.09* | $ 26.03 +3.09* | $ 29.75 +3.09* |

*For all hours paid straight or premium

SUPPLEMENTAL BENEFITS per hour:

| | |
|---|---|
| All Terms | $ 16.30 |

11-279.2B/H&H

## Carpenter - Floor Coverer — 12/01/2024

**JOB DESCRIPTION** Carpenter - Floor Coverer **DISTRICT** 11

**ENTIRE COUNTIES**
Columbia, Sullivan, Ulster

**PARTIAL COUNTIES**
Orange: The area lying on Northern side of Orange County demarcated by a line drawn from the Bear Mountain Bridge continuing west to the Bear Mountain Circle, continue North on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W, then east on County Road 107 to Route 32, then north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

**WAGES**
WAGES:(per hour)

| | 07/01/2024 | 07/01/2025 Additional |
|---|---|---|
| Carpet/Resilient Floor Coverer | $ 37.19 +6.31* | $ 2.23** |

* For all hours paid straight or premium
** To be allocated at a later date.

**SHIFT WORK**
SHIFT DIFFERENTIAL: When mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen (15) percent of wage plus applicable benefits.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journey worker | $ 30.65 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
BUILDING:
Paid: See ( 1 ) on HOLIDAY PAGE.
Overtime: See ( 5, 6, 16, 25 ) on HOLIDAY PAGE.
- Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:
Paid: See ( 5, 6, 25 ) on HOLIDAY PAGE
Overtime: See ( 5, 6 ) on HOLIDAY PAGE
- Holidays that fall on Sunday will be observed Monday
- Must be employed during the five (5) work days immediately preceding a holiday or during the five (5) work days following the paid holiday to receive holiday pay
- If Employee is entitled to a paid holiday, the Employee is paid the Holiday wage and supplemental benefits whether they work or not. If Employee works the Holiday, the Employee will receive holiday pay (including supplemental benefits), plus the applicable premium wage for working the Holiday. If Employee works in excess of 8 hours on Holiday, then benefits will be paid for any hours in excess of 8 hours.

**REGISTERED APPRENTICES**
1 Year terms at the following wage rates.

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 18.60 +3.09* | $ 22.31 +3.09* | $ 26.03 +3.09* | $ 29.75 +3.09* |

*For all hours paid straight or premium

SUPPLEMENTAL BENEFITS per hour:

| | |
|---|---|
| All terms | $ 16.30 |

11-279.2Floor

## Electrician — 12/01/2024

**JOB DESCRIPTION** Electrician **DISTRICT** 11

**ENTIRE COUNTIES**
Orange, Putnam, Rockland

**PARTIAL COUNTIES**
Dutchess: Towns of Fishkill, East Fishkill, and Beacon.

**WAGES**
Per hour:

| | 07/01/2024 |
|---|---|
| Electrician Wireman/Technician | $ 50.50 |
| | + 9.50* |

*For all hours paid straight or premium, not to be included in 3% calculation for supplemental benefits.

NOTE ADDITIONAL AMOUNTS PAID FOR THE FOLLOWING WORK LISTED BELOW (subject to overtime premiums):
- On jobs where employees are required to work from boatswain chairs, swinging scaffolds, etc., forty (40) feet or more above the ground, or under compressed air, using Scottair packs, or gas masks, they shall receive an additional $2.00 per hour above the regular straight time rate.
- Journeyman Wireman working in Shafts, Tunnels or on Barges: $5.00 above the Journeyman Wireman rate of pay
- Journeyman Wireman when performing welding or cable splicing: $3.00 above the Journeyman Wireman rate of pay
- Journeyman Wireman required to have a NYS Asbestos Certificate: $3.00 above the Journeyman Wireman rate of pay
- Journeyman Wireman required to have a CDL: $3.00 above the Journeyman Wireman rate of pay.

**SHIFT WORK**
SHIFT DIFFERENTIAL: On Public Work in New York State when shift work is mandated either in the job specifications or by the contracting agency, the following rates apply when shift is worked:

| | |
|---|---|
| Between 4:30pm & 12:30am | $ 59.30 |
| | + 9.50* |
| Between 12:30am & 8:30am | $66.35 |
| | + 9.50* |

**SUPPLEMENTAL BENEFITS**

| Per hour: | 07/01/2024 |
|---|---|
| Journeyman | $ 29.68 plus 3% of straight or premium wage |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 13, 15, 16, 25) on HOLIDAY PAGE
When the holiday falls on a Saturday it is observed the Friday before. When the holiday falls on a Sunday it is observed on the Monday after.

**REGISTERED APPRENTICES**
WAGES:
(1)year terms at the following rates

| 07/01/2024 | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|
| 1st Shift | $ 16.01 | $ 19.40 | $ 24.25 | $ 29.10 | $ 33.95 | $ 36.38 |
| | +1.00* | +1.00* | +1.50* | +2.00* | +2.50* | +2.50* |
| 2nd Shift | 18.78 | 22.76 | 28.45 | 34.13 | 39.82 | 42.67 |
| | +1.00* | +1.00* | +1.50* | +2.00* | +2.50* | +2.50* |
| 3rd Shift | 21.04 | 25.49 | 31.86 | 38.24 | 44.61 | 47.80 |
| | +1.00* | +1.00* | +1.50* | +2.00* | +2.50* | +2.50* |

| 09/01/2024 | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|
| 1st Shift | $ 16.01 | $ 19.40 | $ 24.25 | $ 29.10 | $ 33.95 | $ 36.38 |
| | +1.00* | +1.00* | +1.00* | +2.00* | +2.50* | +2.50* |
| 2nd Shift | 18.78 | 22.76 | 28.45 | 34.13 | 39.82 | 42.67 |
| | +1.00* | +1.00* | +1.00* | +2.00* | +2.50* | +2.50* |
| 3rd Shift | 21.04 | 25.49 | 31.86 | 38.24 | 44.61 | 47.80 |
| | +1.00* | +1.00* | +1.00* | +2.00* | +2.50* | +2.50* |

| 04/01/2025 | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|
| 1st Shift | $ 16.34 | $ 19.80 | $ 24.75 | $ 29.70 | $ 34.65 | $ 37.13 |
| | +1.00* | +1.00* | +1.00* | +2.00* | +2.50* | +2.50* |
| 2nd Shift | 19.17 | 23.23 | 29.03 | 34.84 | 40.64 | 43.55 |
| | +1.00* | +1.00* | +1.00* | +2.00* | +2.50* | +2.50* |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3rd Shift | 21.47 +1.00* | 26.02 +1.00* | 32.52 +1.00* | 39.03 +2.00* | 45.53 +2.50* | 48.79 +2.50* |

*For all hours paid straight or premium, not to be included in 3% calculation for supplemental benefits.

SUPPLEMENTAL BENEFITS per hour:

07/01/2024

| | |
|---|---|
| 1st term | $ 16.28 plus 3% of straight or premium wage |
| 2nd term | $ 16.28 plus 3% of straight or premium wage |
| 3rd term | $ 18.28 plus 3% of straight or premium wage |
| 4th term | $ 18.78 plus 3% of straight or premium wage |
| 5th term | $ 20.28 plus 3% of straight or premium wage |
| 6th term | $ 20.28 plus 3% of straight or premium wage |

09/01/2024

| | |
|---|---|
| 1st term | $ 16.28 plus 3% of straight or premium wage |
| 2nd term | $ 17.78 plus 3% of straight or premium wage |
| 3rd term | $ 18.78 plus 3% of straight or premium wage |
| 4th term | $ 19.78 plus 3% of straight or premium wage |
| 5th term | $ 21.28 plus 3% of straight or premium wage |
| 6th term | $ 21.28 plus 3% of straight or premium wage |

11-363/1

## Elevator Constructor — 12/01/2024

**JOB DESCRIPTION** Elevator Constructor **DISTRICT** 1

**ENTIRE COUNTIES**
Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, Ulster

**PARTIAL COUNTIES**
Delaware: Towns of Andes, Bovina, Colchester, Davenport, Delhi, Harpersfield, Hemdon, Kortright, Meredith, Middletown, Roxbury, Hancock & Stamford
Rockland: Only the Township of Stony Point.
Westchester: Only the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

**WAGES**

| Per Hour | 07/01/2024 | 01/01/2025 |
|---|---|---|
| Mechanic | $ 70.15 | $ 73.07 |
| Helper | 70% of Mechanic Wage Rate | 70% of Mechanic Wage Rate |

**SUPPLEMENTAL BENEFITS**
Per hour

| | 07/01/2024 | 01/01/2025 |
|---|---|---|
| Journeyworker/Helper | $ 37.885* | $ 38.435* |

(*)Plus 6% of regular hourly if less than 5 years of service. Plus 8% of regular hourly rate if more than 5 years of service.

**OVERTIME PAY**
See (D, O) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 15, 16) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE
Note: When a paid holiday falls on Saturday, it shall be observed on Friday. When a paid holiday falls on Sunday, it shall be observed on Monday.

**REGISTERED APPRENTICES**
Wages per hour:

| 0-6 mo* | 6-12 mo | 2nd yr | 3rd yr | 4th yr |
|---|---|---|---|---|
| 50 % | 55 % | 65 % | 70 % | 80 % |

(*)Plus 6% of the hourly rate, no additional supplemental benefits.

Supplemental Benefits per hour worked:

Same as Journeyperson/Helper

1-138

## Glazier 12/01/2024

**JOB DESCRIPTION** Glazier **DISTRICT** 8

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

**WAGES**
Per hour:

| | 07/01/2024 | 05/01/2025 Additional |
|---|---|---|
| Glazier, Glass Tinting and Window Film | $ 63.28 | $ 1.11*** |
| Scaffolding, including swing scaffold | 67.28 | |
| *Mechanical Equipment | 64.28 | |
| **Repair & Maintenance | 30.76 | |

*Mechanical equipment, scissor jacks, man lifts, booms & buckets 30' or more, but not pipe scaffolding.
**Repair & Maintenance- All repair & maintenance work on a particular building whenever performed, where the total cumulative Repair & Maintenance contract value is under $193,000.

***To be allocated at a later date.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | 7/01/2024 |
|---|---|
| Glazier, Glass Tinting Window Film, Scaffolding and Mechanical Equipment | $ 42.13 |
| Repair & Maintenance | 24.62 |

**OVERTIME PAY**
See (B, E, Q, V) on OVERTIME PAGE
For 'Repair & Maintenance' see (B, B2, I, S) on overtime page.

**HOLIDAY**
Paid: See (5, 6, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE
For 'Repair & Maintenance'
Paid: See(5, 6, 16, 25)
Overtime: See(5, 6, 16, 25)

**REGISTERED APPRENTICES**
Wage per hour:
(1) year terms at the following wage rates:

| | 7/01/2024 |
|---|---|
| 1st term | $ 22.34 |
| 2nd term | 30.64 |
| 3rd term | 40.87 |
| 4th term | 50.14 |

Supplemental Benefits:
(Per hour)

| | |
|---|---|
| 1st term | $ 19.27 |
| 2nd term | 27.34 |
| 3rd term | 32.85 |
| 4th term | 36.01 |

8-1087 (DC9 NYC)

## Insulator - Heat & Frost 12/01/2024

**JOB DESCRIPTION** Insulator - Heat & Frost **DISTRICT** 8

**ENTIRE COUNTIES**
Dutchess, Orange, Putnam, Rockland, Westchester

**WAGES**
Per hour: 07/01/2024

| | |
|---|---|
| Insulator | $ 60.85 |
| Discomfort & Additional Training** | 63.92 |
| Fire Stop Work* | 32.97 |

* Applies on all exclusive Fire Stop Work (When contract is for Fire Stop work only). No apprentices on these contracts only.

**Applies to work requiring; garb or equipment worn against the body not customarily worn by insulators; psychological evaluation ;special training, including but not limited to "Yellow Badge" radiation training

Note: Additional $0.50 per hour for work 30 feet or more above floor or ground level.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyworker | $ 38.25 |
| Discomfort & Additional Training | 40.32 |
| Fire Stop Work: | |
| Journeyworker | 19.48 |

**OVERTIME PAY**
See (B, E, E2, Q, *T) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Note: Last working day preceding Christmas and New Years day, workers shall work no later than 12:00 noon and shall receive 8 hrs pay.

Overtime: See ( 2*, 4, 6, 16, 25 ) on HOLIDAY PAGE.
*Note: Labor Day triple time if worked.

**REGISTERED APPRENTICES**
(1) year terms:

Insulator Apprentices:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 32.97 | $ 38.54 | $ 44.12 | $ 49.70 |

Discomfort & Additional Training Apprentices:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 34.51 | $ 40.38 | $ 46.27 | $ 52.16 |

Supplemental Benefits paid per hour:

Insulator Apprentices:

| | |
|---|---|
| 1st term | $ 19.48 |
| 2nd term | 23.23 |
| 3rd term | 26.98 |
| 4th term | 30.74 |

Discomfort & Additional Training Apprentices:

| | |
|---|---|
| 1st term | $ 20.50 |
| 2nd term | 24.47 |
| 3rd term | 28.43 |
| 4th term | 32.39 |

8-91

## Ironworker — 12/01/2024

**JOB DESCRIPTION** Ironworker **DISTRICT** 11

**ENTIRE COUNTIES**
Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster

**WAGES**
Per hour:

| | 07/01/2024 | 07/01/2025 Additional | 07/01/2026 Additional |
|---|---|---|---|
| Structural | $ 51.38 | $ 2.00* | $2.00* |

| | | | |
|---|---|---|---|
| Reinforcing | 51.38 | 2.00* | 2.00* |
| Ornamental | 51.38 | 2.00* | 2.00* |
| Chain Link Fence | 51.38 | 2.00* | 2.00* |

* To be allocated at a later date.

NOTE: For Reinforcing classification ONLY, Ironworker 4-46Reinf rates apply in Rockland County's southern section (south of Convent Road and east of Blue Hills Road).

**SHIFT WORK**
On Government Mandated Irregular Workdays or Shift Work, the following wage will be paid:

| | |
|---|---|
| 1st Shift | $ 51.38 |
| 2nd Shift | 66.39 |
| 3rd Shift | 71.39 |

Note- Any shift that works past 12:00 midnight shall receive the 3rd shift differential.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 45.56 |

**OVERTIME PAY**
See (B1, Q, V) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE
If a holiday falls on Saturday, it will be observed Friday. If a holiday falls on Sunday, it will be observed Monday.

**REGISTERED APPRENTICES**
Wages:

(1) year terms at the following wage:

| | 1st yr | 2nd yr | 3rd yr | 4th yr |
|---|---|---|---|---|
| 1st Shift | $ 25.69 | $ 30.83 | $ 35.97 | $ 41.10 |
| 2nd Shift | 36.15 | 42.20 | 48.25 | 54.29 |
| 3rd Shift | 39.64 | 45.99 | 52.35 | 58.69 |

Supplemental Benefits per hour:

| | 07/01/2024 |
|---|---|
| 1st year | $ 40.94 |
| 2nd year | 41.86 |
| 3rd year | 42.79 |
| 4th year | 43.71 |

11-417

## Laborer - Building 12/01/2024

**JOB DESCRIPTION** Laborer - Building **DISTRICT** 11

**ENTIRE COUNTIES**
Orange, Sullivan, Ulster

**PARTIAL COUNTIES**
Delaware: Only the Townships of Andes, Bovina, Davenport, Delhi, Franklin, Hamden, Harpersfield, Kortright, Meredith, Middletown, Roxbury, and Stamford.
Greene: Only the Township of Catskill.

**WAGES**
Class 1: Custodial and janitorial work, general cleanup, and flag person.

Class 2: Concrete laborer, mason tending, hod carrier, signal person, pressure blasting and washing, chainsaw, demo saw, jackhammers, general labor.

Class 3: Jumping jack, air track drills, grading, explosive handler and blaster, grade checker. When OSHA requires negative pressure respirator.

Class 4: Environmental work including but not limited to asbestos abatement, toxic and hazardous abatement, lead abatement work, mold remediation and biohazards.

| WAGES: (per hour) | 07/01/2024 | 06/01/2025 Additional | 06/01/2026 Additional |
|---|---|---|---|
| Class 1 | $ 43.15 | $ 2.69* | $ 2.79* |
| Class 2 | 43.95 | 2.72* | 2.82* |

| | | | |
|---|---|---|---|
| Class 3 | 45.90 | 2.79* | 2.89* |
| Class 4 | 49.00 | 2.90* | 3.00* |

*To be allocated at a later date.

These rates will cover all work within five feet of the building foundation line.

**SHIFT WORK**
Shift Differential: On all Governmental mandated irregular or off shift work, an additional 25% of wage is required. The 25% shift differential will be paid on public works contract for shifts or irregular workdays outside the normal working hours for 2nd and 3rd shifts or irregular workday or when mandated or required by state, federal, county, local or other governmental agency contracts.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 33.50 |
| Shift | 40.84 |

**OVERTIME PAY**
See (B, *E, E5, **Q) on OVERTIME PAGE
*For first 8 hours on Saturday
**When an employee is required to work on a holiday which falls on a Sunday the employee shall be paid three (3) times the hourly rate and one (1) hour benefits for every hour worked. When an employee is required to work on a holiday which falls on a Saturday the employee shall be paid two and a half (2.5) times the hourly rate and one hour benefits for every hour worked.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE
Holidays that fall on Saturday shall be observed on Friday, when holidays fall on Sunday they shall be observed on Monday.

**REGISTERED APPRENTICES**
(1000) hour terms at the following wages.

| | 07/01/2024 |
|---|---|
| 1st term | $ 28.05 |
| 2nd term | 32.35 |
| 3rd term | 36.70 |
| 4th term | 41.00 |

Supplemental Benefits per hour:

| | |
|---|---|
| All Terms Regular | $ 29.23 |
| All Terms Shift Rate | 35.39 |

11-17.BA

## Laborer - Heavy&Highway — 12/01/2024

**JOB DESCRIPTION** Laborer - Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**
Orange, Sullivan, Ulster

**PARTIAL COUNTIES**
Delaware: Only the Townships of Andes, Bovina, Middletown, Roxbury,Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield,Meredith, and Davenport.
Greene: Only the Township of Catskill.

**WAGES**
CLASS 1: Flag person, gate person.

CLASS 2: General laborer, chuck tender, nipper, powder carrier, magazine tender, concrete men, vibrator men, mason tender, mortar men, traffic control, custodial work, temporary heat, pump men, pit men, dump men, asphalt men, joint setter, signalman, pipe men, riprap, dry stone layers, jack hammer, bush hammer, pavement breaker, men on mulching & seeding machines, all seeding & sod laying, landscape work, walk behind self-propelled power saws, grinder, walk behind rollers and tampers of all types, burner men, filling and wiring of baskets for gabion walls, chain saw operator, railroad track laborers, power buggy, plaster & acoustic pump, power brush cutter, retention liners, walk behind surface planer, chipping hammer, manhole, catch basin or inlet installing, mortar mixer, laser men. *Micro paving and crack sealing.

CLASS 3: Asbestos, toxic, bioremediation and Phyto-remediation, lead or hazardous materials abatement when certification or license is required, Drilling Equipment Only Where a Separate Air Compressor Unit Supplies Power.

CLASS 4: Asphalt screed man, blaster, all laborers involved in pipejacking and boring operations not exceeding more than 10 feet into pipe, boring or drilled area.

| WAGES: (per hour) | 07/01/2024 |
|---|---|
| Class 1 | $ 42.35 |
| Class 2 | 46.05 |

| | |
|---|---|
| Class 3 | 50.75 |
| Class 4 | 55.80 |

* When laborers are performing micro paving, crack sealing or slurry application when not part of asphalt prep operations laborers shall receive an additional $2.50 per hour over rate.

**To be allocated at a later date.

**SHIFT WORK**
SHIFT DIFFERENTIAL: Night work and irregular shift require 20% increase on wages for all Government mandated night and irregular shift work.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 33.38 |
| Shift | 39.18 |

**OVERTIME PAY**
See (B, E, P, *R, **S, ***T, X) on OVERTIME PAGE
*For Mon-Fri Holidays, Double Benefits to be paid for all hours worked.
**For Saturday Holidays, Two- and one-half Benefits for all hours worked.
***For Sunday Holidays, Triple Benefits for all hours worked.

**HOLIDAY**
Paid: See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 25) on HOLIDAY PAGE
To be eligible for a paid holiday, an employee must work at least two (2) days in the calendar week or payroll week in which the holiday falls.

**REGISTERED APPRENTICES**
(1000) hour terms at the following wages.

| | 07/01/2024 |
|---|---|
| 1st term | $ 28.05 |
| 2nd term | 32.35 |
| 3rd term | 36.70 |
| 4th term | 41.00 |

Supplemental Benefits per hour:

| | |
|---|---|
| All Terms Regular | $ 29.23 |
| All Terms Shift Rate | 34.16 |

11-17.1H/H

## Laborer - Tunnel — 12/01/2024

**JOB DESCRIPTION** Laborer - Tunnel **DISTRICT** 11

**ENTIRE COUNTIES**
Columbia, Dutchess, Greene, Orange, Otsego, Putnam, Rockland, Sullivan, Ulster, Westchester

**PARTIAL COUNTIES**
Chenango: Townships of Columbus, Sherburne and New Berlin.
Delaware: Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Merideth and Davenport.

**WAGES**
Class 1: All support laborers/sandhogs working above the shaft or tunnel.

Class 2: All laborers/sandhogs working in the shaft or tunnel.

Class 4: Safety Miners

Class 5: Site work related to Shaft/Tunnel

WAGES: (per hour)

| | 07/01/2024 | 06/01/2025 |
|---|---|---|
| Class 1 | $ 57.05 | $ 58.55 |
| Class 2 | 59.20 | 60.70 |
| Class 4 | 65.60 | 67.10 |
| Class 5 | 49.90 | 51.40 |

Toxic and hazardous waste, lead abatement and asbestos abatement work will be paid an additional $ 3.00 an hour.

**SHIFT WORK**
SHIFT DIFFERENTIAL...On all Government mandated irregular shift work:

- Employee shall be paid at time and one half the regular rate Monday through Friday.
- Saturday shall be paid at 1.65 times the regular rate.
- Sunday shall be paid at 2.15 times the regular rate.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | | |
|---|---|---|
| Benefit 1 | $ 36.98 | $ 38.23 |
| Benefit 2 | 55.39 | 59.99 |
| Benefit 3 | 74.58 | 76.73 |

Benefit 1 applies to straight time hours, paid holidays not worked.
Benefit 2 applies to over 8 hours in a day (M-F), irregular shift work hours worked, and Saturday hours worked.
Benefit 3 applies to Sunday and Holiday hours worked.

**OVERTIME PAY**
See (B, E, Q, X) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE
When a recognized Holidays falls on Saturday or Sunday, holidays falling on Saturday shall be recognized or observed on Friday and holidays falling on Sunday shall be recognized or observed on Monday. Employees ordered to work on the Saturday or Sunday of the holiday or on the recognized or the observed Friday or Monday for those holidays falling on Saturday or Sunday shall receive double time the established rate and benefits for the holiday.

**REGISTERED APPRENTICES**
FOR APPRENTICE RATES, refer to the appropriate Laborer Heavy & Highway wage rate contained in the wage schedule for the County and location where the work is to be performed.

11-17/60/235/754Tun

## Lineman Electrician — 12/01/2024

**JOB DESCRIPTION** Lineman Electrician **DISTRICT** 6

**ENTIRE COUNTIES**
Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

**WAGES**
A Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors, assembly of all electrical materials, conduit, pipe, or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

Crane Operators: Operation of any type of crane on line projects.
Crawler Backhoe: Operation of tracked excavator/crawler backhoe with 1/2 yard bucket or larger on line projects.
Digging Machine Operator: All other digging equipment and augering on line projects.

A Groundman/Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator/equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines. Also includes digging of holes for poles, anchors, footer, and foundations for electrical equipment.

Below rates applicable on all overhead and underground distribution and maintenance work, and all overhead and underground transmission line work and the installation of fiber optic cable where no other construction trades are or have been involved. Includes access matting for line work.

| Per hour: | 07/01/2024 |
|---|---|
| Group A: | |
| Lineman, Technician | $ 58.90 |
| Crane, Crawler Backhoe | 58.90 |
| Welder, Cable Splicer | 58.90 |

| | |
|---|---|
| Group B: | |
| Digging Mach. Operator | 53.01 |
| Tractor Trailer Driver | 50.07 |
| Groundman, Truck Driver | 47.12 |
| Equipment Mechanic | 47.12 |
| Flagman | 35.34 |

Additional $1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all electrical sub-stations, switching structures, fiber optic cable and all other work not defined as "Utility outside electrical work." Includes access matting for line work.

| | |
|---|---|
| Group A: | |
| Lineman, Technician | $ 58.90 |
| Crane, Crawler Backhoe | 58.90 |
| Cable Splicer | 64.79 |
| Certified Welder, Pipe Type Cable | 61.85 |

| | |
|---|---|
| Group B: | |
| Digging Mach. Operator | 53.01 |
| Tractor Trailer Driver | 50.07 |
| Groundman, Truck Driver | 47.12 |
| Equipment Mechanic | 47.12 |
| Flagman | 35.34 |

Additional $1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all switching structures, maintenance projects, railroad catenary install/maintenance third rail installation, bonding of rails and pipe type cable and installation of fiber optic cable. Includes access matting for line work.

| | |
|---|---|
| Group A: | |
| Lineman, Tech, Welder | $ 60.22 |
| Crane, Crawler Backhoe | 60.22 |
| Cable Splicer | 66.24 |
| Certified Welder, Pipe Type Cable | 63.23 |

| | |
|---|---|
| Group B: | |
| Digging Mach. Operator | 54.20 |
| Tractor Trailer Driver | 51.19 |
| Groundman, Truck Driver | 48.18 |
| Equipment Mechanic | 48.18 |
| Flagman | 36.13 |

Additional $1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all overhead and underground transmission line work & fiber optic cable where other construction trades are or have been involved. This applies to transmission line work only, not other construction. Includes access matting for line work.

| | |
|---|---|
| Group A: | |
| Lineman, Tech, Welder | $ 61.41 |
| Crane, Crawler Backhoe | 61.41 |

| | |
|---|---|
| Group B: | |
| Digging Mach. Operator | 55.27 |
| Tractor Trailer Driver | 52.20 |
| Groundman, Truck Driver | 49.13 |
| Equipment Mechanic | 49.13 |
| Flagman | 36.85 |

Additional $1.00 per hour for entire crew when a helicopter is used.

**SHIFT WORK**

THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

| | | |
|---|---|---|
| 1ST SHIFT | 8:00 AM to 4:30 PM | REGULAR RATE |

| | |
|---|---|
| 2ND SHIFT | 4:30 PM to 1:00 AM REGULAR RATE PLUS 17.3 % |
| 3RD SHIFT | 12:30 AM to 9:00 AM REGULAR RATE PLUS 31.4 % |

**SUPPLEMENTAL BENEFITS**
Per hour:

| | 07/01/2024 |
|---|---|
| Group A | $ 30.90 *plus 7% of the hourly wage paid |
| Group B | $ 26.90 *plus 7% of the hourly wage paid |

*The 7% is based on the hourly wage paid, straight time or premium time.

**OVERTIME PAY**
See (B, E, Q, X) on OVERTIME PAGE. NOTE: Double time for all emergency work designated by the Dept. of Jurisdiction.
WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

**HOLIDAY**

| | |
|---|---|
| Paid | See ( 5, 6, 8, 13, 25 ) on HOLIDAY PAGE plus Governor of NYS Election Day. |
| Overtime | See ( 5, 6, 8, 13, 25 ) on HOLIDAY PAGE plus Governor of NYS Election Day. |

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

**REGISTERED APPRENTICES**
WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyworker's Lineman wage.

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|
| 60% | 65% | 70% | 75% | 80% | 85% | 90% |

SUPPLEMENTAL BENEFITS per hour:

| | 07/01/2024 |
|---|---|
| | $ 26.90 *plus 7% of the hourly wage paid |

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249a

## Lineman Electrician - Teledata — 12/01/2024

**JOB DESCRIPTION** Lineman Electrician - Teledata **DISTRICT** 6

**ENTIRE COUNTIES**
Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

**WAGES**
Per hour:

For outside work, stopping at first point of attachment (demarcation).

| | 07/01/2024 | 01/01/2025 |
|---|---|---|
| Cable Splicer | $ 39.24 | $ 40.81 |
| Installer, Repairman | $ 37.24 | $ 38.73 |
| Teledata Lineman | $ 37.24 | $ 38.73 |
| Tech., Equip. Operator | $ 37.24 | $ 38.73 |
| Groundman | $ 19.74 | $ 20.53 |

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

**SHIFT WORK**
THE FOLLOWING RATES APPLY WHEN THE CONTRACTING AGENCY MANDATES MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION ARE WORKED. WHEN TWO (2) OR THREE (3) SHIFTS ARE WORKED THE FOLLOWING RATES APPLY:

| | |
|---|---|
| 1ST SHIFT | REGULAR RATE |
| 2ND SHIFT | REGULAR RATE PLUS 10% |
| 3RD SHIFT | REGULAR RATE PLUS 15% |

**SUPPLEMENTAL BENEFITS**

| Per hour: | 07/01/2024 | 01/01/2025 |
|---|---|---|
| Journeyworker | $ 5.70 *plus 3% of the hour wage paid | $ 5.70 *plus 3% of the hour wage paid |

*The 3% is based on the hourly wage paid, straight time rate or premium rate.

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE
WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

## Lineman Electrician - Traffic Signal, Lighting — 12/01/2024

**JOB DESCRIPTION** Lineman Electrician - Traffic Signal, Lighting **DISTRICT** 6

**ENTIRE COUNTIES**
Columbia, Dutchess, Orange, Putnam, Rockland, Ulster

**WAGES**
Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

Crane Operators: Operation of any type of crane on Traffic Signal/Lighting projects.
Crawler Backhoe: Operation of tracked excavator/crawler backhoe with 1/2 yard bucket or larger on Traffic Signal/Lighting projects.
Digging Machine Operator: All other digging equipment and augering on Traffic Signal/Lighting projects.

A Groundman/Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator/equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.

| Per hour: | 07/01/2024 |
|---|---|
| Group A: | |
| Lineman, Technician | $ 51.82 |
| Crane, Crawler Backhoe | 51.82 |
| Certified Welder | 54.41 |
| Group B: | |
| Digging Machine | 46.64 |
| Tractor Trailer Driver | 44.05 |
| Groundman, Truck Driver | 41.46 |
| Equipment Mechanic | 41.46 |
| Flagman | 31.09 |

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

**SHIFT WORK**

THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

| | |
|---|---|
| 1ST SHIFT | 8:00 AM TO 4:30 PM REGULAR RATE |
| 2ND SHIFT | 4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3% |
| 3RD SHIFT | 12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4% |

**SUPPLEMENTAL BENEFITS**

Per hour worked:

| | 07/01/2024 |
|---|---|
| Group A: | $ 30.90 *plus 7% of the hourly wage paid |
| Group B | $ 26.90 *plus 7% of the hourly wage paid |

*The 7% is based on the hourly wage paid, straight time or premium time.

**OVERTIME PAY**

See (B, E, Q, X) on OVERTIME PAGE. NOTE: Double time for all emergency work designated by the Dept. of Jurisdiction.
WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

**HOLIDAY**

Paid: See ( 5, 6, 8, 13, 25 ) on HOLIDAY PAGE and Governor of NYS Election Day.
Overtime: See ( 5, 6, 8, 13, 25 ) on HOLIDAY PAGE and Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

**REGISTERED APPRENTICES**

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyworker's Lineman wage.

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|
| 60% | 65% | 70% | 75% | 80% | 85% | 90% |

SUPPLEMENTAL BENEFITS per hour:

| 07/01/2024 |
|---|
| $ 26.90 *plus 7% of the hourly wage paid |

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aReg8LT

## Lineman Electrician - Tree Trimmer — 12/01/2024

**JOB DESCRIPTION** Lineman Electrician - Tree Trimmer **DISTRICT** 6

**ENTIRE COUNTIES**

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

**WAGES**

Applies to line clearance, tree work and right-of-way preparation on all new or existing energized overhead or underground electrical, telephone and CATV lines. This also includes stump removal near underground energized electrical lines including telephone and CATV lines.

| Per hour: | 07/01/2024 |
|---|---|
| Tree Trimmer | $ 31.44 |
| Equipment Operator | 27.80 |
| Equipment Mechanic | 27.80 |
| Truck Driver | 23.15 |
| Groundman | 19.07 |
| Flag person | 15.00* |

*NOTE-Rate effective on 01/01/2025 - $15.50 due to minimum wage increase.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | 07/01/2024 |
|---|---|
| Journeyworker | $ 10.48 *plus 4.5% of the hourly wage paid |

* The 4.5% is based on the hourly wage paid, straight time rate or premium rate.

**OVERTIME PAY**
See (B, E, Q, X) on OVERTIME PAGE
WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

**HOLIDAY**
Paid: See (5, 6, 8, 15) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 16, 25) on HOLIDAY PAGE
NOTE: All paid holidays falling on a Saturday shall be observed on the preceding Friday. All paid holidays falling on a Sunday shall be observed on the following Monday.

6-1249TT

## Mason - Building — 12/01/2024

**JOB DESCRIPTION** Mason - Building **DISTRICT** 11

**ENTIRE COUNTIES**
Dutchess, Sullivan, Ulster

**PARTIAL COUNTIES**
Orange: Entire county except the Township of Tuxedo.

**WAGES**
Per hour:

| | 07/01/2024 |
|---|---|
| Bricklayer | $ 46.45 |
| Cement Mason | 46.45 |
| Plasterer/Stone Mason | 46.45 |
| Pointer/Caulker | 46.45 |

Additional $1.00 per hour for power saw work
Additional $0.50 per hour for swing scaffold or staging work

**SHIFT WORK**
SHIFT WORK: When shift work or an irregular workday is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:
Irregular workday requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 38.00 |

**OVERTIME PAY**
Cement Mason See ( B, E, Q, W ) on OVERTIME PAGE.
All Others See ( B, E, Q ) on OVERTIME PAGE.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE
Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

**REGISTERED APPRENTICES**
Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5du-b

## Mason - Building — 12/01/2024

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Dutchess, Orange, Putnam, Sullivan, Ulster

**WAGES**

| Per hour: | 07/01/2024 | 12/02/2024 |
|---|---|---|
| Building: | | Additional |
| Tile, Marble,& Terrazzo Mechanic/Setter | $ 58.06 | $ 0.63* |

*To be allocated at a later date.

**SUPPLEMENTAL BENEFITS**
Per Hour:
Journeyworker: $ 25.11*
+ 6.14

* This portion of benefits subject to same premium rate as shown for overtime wages.

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE
Double time rate applies after 10 hours

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wage per hour:
(Counties of Orange & Putnam)
750 hour terms at the following wage rate:

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| 1-750 | 751-1500 | 1501-2250 | 2251-3000 | 3001-3750 | 3751-4500 | 4501-5250 | 5251-6000 | 6001-6750 | 6751-7500 |
| 07/01/2024 | | | | | | | | | |
| $22.19 | $27.21 | $34.45 | $39.46 | $43.07 | $46.58 | 50.23 | $55.24 | $57.71 | $62.00 |

Supplemental Benefits per hour:
(Counties of Orange & Putnam)

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| 07/01/2024 | | | | | | | | | |
| $12.55* + 0.76 | $12.55* + 0.81 | $15.36* + 0.91 | $15.36* + 0.96 | $16.36* + 1.43 | $17.86* + 1.48 | $18.86* + 1.91 | $18.86* + 1.97 | $18.86* + 4.57 | $24.11* + 5.18 |

Wages per hour:
(Counties of Dutchess, Sullivan, Ulster)

750 hour terms at the following wage rate:

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| 1- | 751- | 1501- | 2251- | 3001- | 3751- | 4501- | 5251- | 6001- | 6751- |
| 750 | 1500 | 2250 | 3000 | 3750 | 4500 | 5250 | 6000 | 6750 | 7500 |
| 07/01/2024 | | | | | | | | | |
| $22.06 | $26.44 | $28.50 | $32.88 | $35.84 | $39.71 | $43.21 | $46.59 | $47.95 | $51.44 |

Supplemental Benefits per hour:
(Counties of Dutchess, Sullivan, Ulster)

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| 07/01/2024 | | | | | | | | | |
| $12.55* + 0.76 | $12.55* + 0.80 | $14.86* + 0.85 | $14.86* + 0.89 | $15.86* + 1.35 | $16.36* + 1.40 | $16.86* + 1.82 | $17.86* + 1.87 | $17.86* + 4.93 | $22.61* + 5.02 |

* This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52B

## Mason - Building — 12/01/2024

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Dutchess, Orange, Putnam, Sullivan, Ulster

**WAGES**

| Per hour: | 07/01/2024 | 12/02/2024 |
|---|---|---|
| Building Tile, Marble, & Terrazzo Finisher | $ 47.74 | $ 47.82 |

*To be allocated at a later date.

**SUPPLEMENTAL BENEFITS**
Journeyworker:

| | | |
|---|---|---|
| Per Hour | $ 22.11* | $ 22.56* |
| | + 6.01 | + 6.02 |

*This portion of benefits subject to same premium rate as shown for overtime wages

**OVERTIME PAY**
See (A, *E, Q) on OVERTIME PAGE
Double time rate applies after 10 hours on Saturdays.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88B-tf

## Mason - Building — 12/01/2024

**JOB DESCRIPTION** Mason - Building **DISTRICT** 11

**ENTIRE COUNTIES**
Putnam, Rockland, Westchester

**PARTIAL COUNTIES**
Orange: Only the Township of Tuxedo.

**WAGES**
Per hour:

| | 07/01/2024 |
|---|---|
| Bricklayer | $ 47.44 |
| Cement Mason | 47.44 |
| Plasterer/Stone Mason | 47.44 |
| Pointer/Caulker | 47.44 |

Additional $1.00 per hour for power saw work
Additional $0.50 per hour for swing scaffold or staging work

**SHIFT WORK**
SHIFT WORK: When shift work or an irregular workday is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:
Irregular workday requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 38.50 |

**OVERTIME PAY**
OVERTIME:

| | |
|---|---|
| Cement Mason | See ( B, E, Q, W ) on OVERTIME PAGE. |
| All Others | See ( B, E, Q ) on OVERTIME PAGE. |

**HOLIDAY**

| | |
|---|---|
| Paid: | See (1) on HOLIDAY PAGE |
| Overtime: | See (5, 6, 16, 25) on HOLIDAY PAGE |

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

**REGISTERED APPRENTICES**
Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5wp-b

## Mason - Building — 12/01/2024

**JOB DESCRIPTION** Mason - Building **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

**WAGES**
Per Hour:

| | 07/01/2024 | 01/06/2025 Additional |
|---|---|---|
| Marble Cutters & Setters | $ 63.92 | $ 0.75* |

*To be allocated at a later date.

**SUPPLEMENTAL BENEFITS**
Per Hour:

Journeyworker $ 40.05

**OVERTIME PAY**
See (B, E, Q, V) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wage Per Hour:
07/01/2024
750 hour terms at the following wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 0-3000 | 3001-3750 | 3751-4500 | 4501-5250 | 5251-6000 | 6001-6750 | 6751-7500 | 7500+ |
| $ 27.01 | $ 40.52 | $ 43.88 | $ 47.26 | $ 50.64 | $ 54.32 | $ 60.71 | $ 63.92 |

Supplemental Benefits per hour:
07/01/2024

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| $ 26.42 | $ 29.76 | $ 30.61 | $ 31.44 | $ 32.28 | $ 37.55 | $ 39.23 | $ 40.05 |

9-7/4

## Mason - Heavy&Highway 12/01/2024

**JOB DESCRIPTION** Mason - Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**
Dutchess, Sullivan, Ulster

**PARTIAL COUNTIES**
Orange: Entire county except the Township of Tuxedo.

**WAGES**
Per hour:

| | 07/01/2024 |
|---|---|
| Bricklayer | $ 46.95 |
| Cement Mason | 46.95 |
| Marble/Stone Mason | 46.95 |
| Plasterer | 46.95 |
| Pointer/Caulker | 46.95 |

Additional $1.00 per hour for power saw work
Additional $0.50 per hour for swing scaffold or staging work

**SHIFT WORK**
When shift work or an irregular workday is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:
Irregular workday requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

**SUPPLEMENTAL BENEFITS**
Per hour:
Journeyman $ 38.00

**OVERTIME PAY**
Cement Mason See ( B, E, Q, W )
All Others See ( B, E, Q )

**HOLIDAY**
Paid: See (5, 6, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE
- Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.
- Supplemental Benefits are not paid for paid Holiday
- If Holiday is worked, Supplemental Benefits are paid for hours worked.
- Whenever an Employee works within three (3) calendar days before a holiday, the Employee shall be paid for the Holiday.

**REGISTERED APPRENTICES**
Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5du-H/H

## Mason - Heavy&Highway — 12/01/2024

**JOB DESCRIPTION** Mason - Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**
Putnam, Rockland, Westchester

**PARTIAL COUNTIES**
Orange: Only the Township of Tuxedo.

**WAGES**
Per hour:

| | 07/01/2024 |
|---|---|
| Bricklayer | $ 47.94 |
| Cement Mason | 47.94 |
| Marble/Stone Mason | 47.94 |
| Plasterer | 47.94 |
| Pointer/Caulker | 47.94 |

Additional $1.00 per hour for power saw work
Additional $0.50 per hour for swing scaffold or staging work

**SHIFT WORK**
When shift work or an irregular workday is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:

Irregular workday requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 38.50 |

**OVERTIME PAY**

| | |
|---|---|
| Cement Mason | See ( B, E, Q, W ) |
| All Others | See ( B, E, Q, ) |

**HOLIDAY**

| | |
|---|---|
| Paid: | See (5, 6, 16, 25) on HOLIDAY PAGE |
| Overtime: | See (5, 6, 16, 25) on HOLIDAY PAGE |

- Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.
- Supplemental Benefits are not paid for paid Holiday
- If Holiday is worked, Supplemental Benefits are paid for hours worked.
- Whenever an Employee works within three (3) calendar days before a holiday, the Employee shall be paid for the Holiday.

**REGISTERED APPRENTICES**
Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| 50% | 55% | 60% | 65% | 70% | 75% | 80% | 85% |

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5WP-H/H

**Operating Engineer - Building / Heavy&Highway** **12/01/2024**

**JOB DESCRIPTION** Operating Engineer - Building / Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**
Delaware, Orange, Rockland, Sullivan, Ulster

**WAGES**
CLASS A5: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with 140ft boom and over.
CLASS A4: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with 100ft to 139ft boom.
CLASS A3: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes with a boom under 100ft.
CLASS A2: Cranes, Derricks and Pile Drivers less than 100 tons with 140ft boom and over.
CLASS A1: Cranes, Derricks and Pile Drivers less than 100 tons with a 100ft to 139ft boom.

CLASS A: Cranes, Derricks and Pile Drivers less than 100 tons with a boom under 100ft.; Autograde Combination Subgrader, Base Material Spreader and Base Trimmer (CMI and Similar Types); Autograde Pavement profiler (CMI and Similar Types); Autograde Pavement Profiler and Recycle type (CMI and Similar Type); Autograde Placer-Trimmer-Spreader Comb. (CMI & Similar types); Autograde Slipform Paver (CMI & Similar Types); Central Power Plants (all types); Chief of Party; Concrete Paving Machines; Drill (Bauer, AMI and Similar Types); Drillmaster, Quarrymaster (Down the Hole Drill), Rotary Drill, Self-Propelled Hydraulic Drill, Self-Powered Drill; Draglines; Elevator Graders; Excavator; Front End Loaders (5 yds. and over); Gradall's; Grader-Rago; Helicopters (Co-Pilot); Helicopters (Communications Engineer);Juntann Pile Driver; Locomotive (Large); Mucking Machines; Pavement & Concrete Breaker, i.e., Superhammer & Hoe Ram; Roadway Surface Grinder; Prentice Truck; Scooper (Loader and Shovel); Shovels; Tree Chopper with Boom; Trench Machines (Cable Plow); Tunnel Boring Machine; Vacuum Truck

CLASS B: "A" Frame; Backhoe (Combination); Boom Attachment on Loaders (Rate based on size of Bucket) not applicable to Pipehook; Boring and Drilling Machines; Brush Chopper, Shredder and Tree Shredder, Tree Shearer; Bulldozer(Fine Grade); Cableways; Carryalls; Concrete Pump; Concrete Pumping System, Pump Concrete and Similar Types; Conveyors (125 ft. and over); Drill Doctor (duties incl. Dust Collector Maintenance); Front End Loaders (2 yds. but less than 5 yds.); Graders (Finish); Groove Cutting Machine (Ride on Type); Heater Planer; Hoists (all type Hoists, shall also include Steam, Gas, Diesel, Electric, Air Hydraulic, Single and Double Drum, Concrete, Brick Shaft Caisson, Snorkel Roof, and/or any other Similar Type Hoisting Machines, portable or stationary, except Chicago Boom Type); Long Boom Rate to be applied if Hoist is "Outside Material Tower Hoist"**; Hydraulic Cranes-10 tons and under; Hydraulic Dredge; Hydro-Axe; Hydro Blaster; Jacks-Screw Air Hydraulic Power Operated Unit or Console Type (not hand Jack or Pile Load Test Type); Log Skidder; Pans; Pavers (all) concrete; Plate and Frame Filter Press; Pumpcrete Machines, Squeezecrete & Concrete Pumping (regardless of size); Scrapers; Side Booms; "Straddle"Carrier-Ross and similar types; Winch Trucks (Hoisting); Whip Hammer

CLASS C: Asphalt Curbing Machine; Asphalt Plant Engineer; Asphalt Spreader; Autograde Tube Finisher and Texturing Machine (CMI & Similar types); Autograde Curecrete Machine (CMI & Similar Types); Autograde Curb Trimmer & Sidewalk, Shoulder, Slipform (CMI & Similar Types); Bar Bending Machines (Power); Barrier Moving Machine-Zipper; Batchers, Batching Plant and Crusher on Site; Belt Conveyor Systems; Boom Type Skimmer Machines; Bridge Deck Finisher; Bulldozer(except fine grade); Car Dumpers (Railroad); Compressor and Blower Type Units (used independently or mounted on dual purpose Trucks, on Job Site or in conjunction with jobsite, in Loading and Unloading of Concrete, Cement, Fly Ash, Instantcrete, or Similar Type Materials); Compressors (2 or 3 in Battery); Concrete Finishing Machines; Concrete cleaning decontamination machine operator; Concrete Saws and Cutters (Ride-on type); Concrete Spreaders (Hetzel, Rexomatic and Similar Types); Concrete Vibrators; Conveyors (under 125 feet); Crushing Machines; Directional Boring Machines; Ditching Machine-small (Ditch-witch, Vermeer, or Similar type); Dope Pots (Mechanical with or without pump); Dumpsters; Elevator; Fireman; Fork Lifts (Economobile, Lull and Similar Types of Equipment); Front End Loaders (1 yd. and over but under 2 yds.); Generators (2 or 3 in Battery); Giraffe Grinders; Grout Pump; Gunnite Machines (excluding nozzle); Hammer Vibrator (in conjunction with Generator); Heavy Equipment Robotics Operator Technician; Hoists-Roof, Tugger, Aerial Platform Hoist & House Cars; Hoppers; Hopper Doors (power operated); Hydro Blaster; Hydraulic Jacking Trailer; Ladders (motorized); Laddervator; Locomotive-dinky type; Maintenance -Utility Man; Master Environmental Maintenance Technician; Mechanics; Mixers (Excepting Paving Mixers); Motor Patrols; Pavement Breakers (small self - propelled ride on type-also maintains compressor hydraulic unit); Pavement Breaker-truck mounted; Pipe Bending Machine (Power); Pitch Pump; Plaster Pump (regardless of size); Post Hole Digger (Post Pounder & Auger); Pot Hole Killer Trucks or equivalent; Rod Bending Machines (Power); Roller-Black Top; Scales (Power); Seaman pulverizing mixer; Shoulder widener; Silos; Skidsteer (all attachments); Skimmer Machines (boom-type); Steel Cutting Machine (service & maintain); Tam Rock Drill; Tractors; Transfer Machine; Captain (Power Boats); Tug Master (powerboats); Ultra High Pressure Waterjet Cutting Tool System operator/maintenance technician; Vacuum Blasting Machine; Vibrating Plants (used in conjunction with unloading); Welder and Repair Mechanics

CLASS D: Brooms and Sweepers; Chippers; Compressor (single); Concrete Spreaders (small type); Conveyor Loaders (not including Elevator Graders); Engines-large diesel (1620 HP) and Staging Pump; Farm Tractors; Fertilizing Equipment (Operation & Maintenance of); Fine Grade Machine (small type); Form Line Graders (small type); Front End Loader (under 1 yard); Generator (single); Grease, Gas, Fuel and Oil supply trucks; Heaters (Nelson or other type incl. Propane, Natural Gas or Flow type Units); Lights, Portable Generating Light Plants; Mixers (Concrete, small); Mulching Equipment (Operation and Maintenance of); Pumps (2 or less than 4 inch suction); Pumps (4 inch suction and over incl. submersible pumps); Pumps (Diesel Engine and Hydraulic-immaterial of power); Road Finishing Machines (small type); Rollers-grade, fill or stone base; Seeding Equip. (Operation and Maintenance of); Sprinkler & Water Pump Trucks (used on jobsite or in conjunction with jobsite); Steam Jennies and Boilers-irrespective of use; Stone Spreader; Tamping Machines, Vibrating Ride-on; Temporary Heating Plant (Nelson or other type, incl. Propane, Natural Gas or Flow Type Units); Water & Sprinkler Trucks (used on or in conjunction with jobsite); Welding Machines (Gas, Diesel, and/or Electric Converters of any type, single, two, or three in a battery); Wellpoint Systems (including installation by Bull Gang and Maintenance of)

CLASS E: Assistant Engineer/Oiler; Drillers Helper; Maintenance Apprentice (Deck Hand); Maintenance Apprentice (Oiler); Mechanics' Helper; Tire Repair and Maintenance; Transit/Instrument Man

WAGES:(per hour)

| | 07/01/2024 | 07/01/2025 Additional |
|---|---|---|
| Class A5 | $ 66.97 plus 5.00* | $ 2.50*** |
| Class A4 | 65.97 plus 5.00* | 2.50*** |
| Class A3 | 64.97 plus 5.00* | 2.50*** |
| Class A2 | 62.47 plus 5.00* | 2.50*** |
| Class A1 | 61.47 plus 5.00* | 2.50*** |
| Class A | 60.47 plus 5.00* | 2.50*** |
| Class B | 58.88 plus 5.00* | 2.50*** |
| Class C | 56.97 plus 5.00* | 2.50*** |
| Class D | 55.34 plus 5.00* | 2.50*** |
| Class E | 51.63 plus 5.00* | 2.50*** |
| Safety Engineer | 61.21 plus 5.00* | 2.50*** |
| | | |
| Helicopter: | | |
| Pilot/Engineer | 62.29 plus 5.00* | 2.50*** |
| Co Pilot | 60.47 plus 5.00* | 2.50*** |
| Communications Engineer | 60.47 plus 5.00* | 2.50*** |
| | | |
| Surveying: | | |
| Chief of Party | 60.47 plus 5.00* | 2.50*** |
| Transit/Instrument Man | 51.63 plus 5.00* | 2.50*** |
| Rod/Chainman | 51.05 plus 5.00* | 2.50*** |

Additional $0.75 for Survey work Tunnel under compressed air.
Additional $0.50 for Hydrographic work.

*The $5.00 is added to the Class Base Wage for all hours worked. Additionally, the $5.00 is subject to the V-Code listed on the OVERTIME CODE Sheet.

**Outside Material Hoist (Class B) receives additional $ 1.00 per hour on 110 feet up to 199 feet total height, $ 2.00 per hour on 200 feet and over total height.

***To be allocated at a later date

- On HAZARDOUS WASTE REMOVAL or ASBESTOS REMOVAL work, or any state or federally DESIGNATED HAZARDOUS WASTE SITE:

For projects bid on or before April 1, 2020...Where the Operating Engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin and eye protection, the Operating Engineer shall receive the hourly wage plus an additional twenty percent (20%) of that wage for the entire shift.

For projects bid after April 1, 2020...On hazardous waste removal work of any kind, including state or federally designated site where the operating engineer is required to wear level A, B, or C personal protection the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour. An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $ 1.00 per hour. This shall also apply to sites where the level D personal protection is required.

**SHIFT WORK**

- SHIFT WORK: On all Government mandated irregular or off shift work, an additional 15% on straight time hours.

**SUPPLEMENTAL BENEFITS**

Per hour:

Journeyman $ 34.00*

*15% premium is also required on shift work benefits

**OVERTIME PAY**
See (B, E, Q, *V, X) on OVERTIME PAGE
*15% premium is also required on shift work benefits

**HOLIDAY**
Paid: See (5, 6, 10, 13, 15) on HOLIDAY PAGE
Overtime: See (5, 6, 10, 13, 15) on HOLIDAY PAGE
Holidays falling on Sunday will be celebrated on Monday.

**REGISTERED APPRENTICES**
(1) year terms at the following percentage of journeyman's wage:

| | |
|---|---|
| 1st year | 60% of Class base wage plus $5.00* |
| 2nd year | 70% of Class base wage plus $5.00* |
| 3rd year | 80% of Class base wage plus $5.00* |
| 4th year | 90% of Class base wage plus $5.00* |

*The $5.00 is added to the Class Base Wage for all hours worked. Additionally, the $5.00 is subject to the V-Code listed on the OVERTIME CODE Sheet.

Supplemental Benefits per hour:

Apprentices $ 34.00

11-825

## Operating Engineer - Marine Dredging 12/01/2024

**JOB DESCRIPTION** Operating Engineer - Marine Dredging **DISTRICT** 4

**ENTIRE COUNTIES**
Albany, Bronx, Cayuga, Clinton, Columbia, Dutchess, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Orange, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

**WAGES**
These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for all equipment and operators are only for marine dredging work in navigable waters found in the counties listed above.

| Per Hour: | 07/01/2024 |
|---|---|
| CLASS A1<br>Deck Captain, Leverman,<br>Mechanical Dredge Operator,<br>Licensed Tug Operator 1000HP or more. | $ 45.26 |
| CLASS A2<br>Crane Operator (360 swing) | 40.33 |
| CLASS B<br>Dozer, Front Loader<br>Operator on Land | To conform to Operating Engineer<br>Prevailing Wage in locality where work<br>is being performed including benefits. |
| CLASS B1<br>Derrick Operator (180 swing)<br>Spider/Spill Barge Operator<br>Operator II, Fill Placer, Engineer<br>Chief Mate, Electrician,Chief Welder,<br>Maintenance Engineer,Licensed Boat, Crew Boat Operator | 39.14 |
| CLASS B2<br>Certified Welder | 36.84 |
| CLASS C1<br>Drag Barge Operator,<br>Steward, Mate,<br>Assistant Fill Placer | 35.83 |

| | |
|---|---|
| CLASS C2<br>Boat Operator | 34.68 |
| CLASS D<br>Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor | 28.81 |

**SUPPLEMENTAL BENEFITS**
Per Hour:
THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

| | |
|---|---|
| All Classes A & B | $ 12.00 plus 7% of straight time wage, Overtime hours add $ 0.63 |
| All Class C & D | $ 11.75 plus 7% of straight time wage, Overtime hours add $ 0.50 |

**OVERTIME PAY**
See (B2, F, R) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 26) on HOLIDAY PAGE

4-25a-MarDredge

## Operating Engineer - Steel Erectors — 12/01/2024

**JOB DESCRIPTION** Operating Engineer - Steel Erectors **DISTRICT** 11

**ENTIRE COUNTIES**
Delaware, Orange, Rockland, Sullivan, Ulster

**WAGES**
CLASS A3: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with a 140 ft. boom and over.

CLASS A2: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with up to a 139 ft. boom and under.

CLASS A1: Cranes, Derricks and Pile Drivers less than 100 tons with a 140 ft. boom and over.

CLASS A: Cranes, Derricks and Pile Drivers less than 100 tons with up to a 139 ft. boom and under.

CLASS B: "A" Frame; Cherry Pickers(10 tons and under); Hoists (all type Hoists, shall also include Steam, Gas, Diesel, Electric, Air Hydraulic, Single and Double Drum, Concrete, Brick Shaft Caisson, Snorkel Roof, and/or any other Similar Type Hoisting Machines, portable or stationary, except Chicago Boom Type); Jacks-Screw Air Hydraulic Power Operated Unit or Console Type (not hand Jack or Pile Load Test Type); Side Booms; Straddle Carrier

CLASS C: Aerial Platform used as Hoist; Compressors (2 or 3 in Battery); Concrete cleaning/ decontamination machine operator; Directional Boring Machines; Elevator or House Cars; Conveyers and Tugger Hoists; Fireman; Fork Lifts; Generators (2 or 3 in Battery); Heavy Equipment Robotics Operator/Technician; Master Environmental Maintenance Technician; Maintenance -Utility Man; Rod Bending Machines (Power); Captain(powerboat); Tug Master; Ultra High Pressure Waterjet Cutting Tool System; Vacuum Blasting Machine; Welding Machines(gas or electric,2 or 3 in battery, including diesels); Transfer Machine; Apprentice Engineer/Oiler with either one compressor or one welding machine when used for decontamination and remediation

CLASS D: Compressor (single); Welding Machines (Gas, Diesel, and/or Electric Converters of any type); Welding System Multiple (Rectifier Transformer type)

CLASS E: Assistant Engineer/Oiler; Maintenance Apprentice (Deck Hand);Drillers Helper; Maintenance Apprentice (Oiler); Mechanics' Helper; Transit/Instrument Man

WAGES:(per hour)

| | 07/01/2024 | 07/01/2025 Additional |
|---|---|---|
| Class A3 | $ 68.99 plus 5.00* | $ 2.50** |
| Class A2 | 67.33 plus 5.00* | 2.50** |
| Class A1 | 64.49 plus 5.00* | 2.50** |
| Class A | 62.83 plus 5.00* | 2.50** |

| | | |
|---|---|---|
| Class B | 60.04 plus 5.00* | 2.50** |
| Class C | 57.38 plus 5.00* | 2.50** |
| Class D | 55.85 plus 5.00* | 2.50** |
| Class E | 52.09 plus 5.00* | 2.50** |
| Vacuum Truck | 60.80 plus 5.00* | 2.50** |
| Safety Engineer | 61.66 plus 5.00* | 2.50** |
| | | |
| Helicopter: | | |
| Pilot/Engineer | 64.49 plus 5.00* | 2.50** |
| Co Pilot | 64.10 plus 5.00* | 2.50** |
| Communications Engineer | 64.10 plus 5.00* | 2.50** |
| | | |
| Surveying: | | |
| Chief of Party | 60.80 plus 5.00* | 2.50** |
| Transit/Instrument man | 52.09 plus 5.00* | 2.50** |
| Rod/Chainman | 51.05 plus 5.00* | 2.50** |

Additional $0.75 for Survey work Tunnels under compressed air.
Additional $0.50 for Hydrographic work.

*The $5.00 is added to the Class Base Wage for all hours worked. Additionally, the $5.00 is subject to the V-Code listed on the OVERTIME CODE Sheet.

**To be allocated at a later date

- On HAZARDOUS WASTE REMOVAL or ASBESTOS REMOVAL work, or any state or federally DESIGNATED HAZARDOUS WASTE SITE:

For projects bid on or before April 1, 2020...Where the Operating Engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin and eye protection, the Operating Engineer shall receive the hourly wage plus an additional twenty percent (20%) of that wage for the entire shift.

For projects bid after April 1, 2020...On hazardous waste removal work of any kind, including state or federally designated site where the operating engineer is required to wear level A, B, or C personal protection the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour. An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $ 1.00 per hour. This shall also apply to sites where the level D personal protection is required.

**SHIFT WORK**
- SHIFT WORK: On all Government mandated irregular or off shift work, an additional 15% on straight time hours.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 34.00* |

*15% premium is also required on shift work benefits

**OVERTIME PAY**
See (B, E, Q, *V, X) on OVERTIME PAGE
*15% premium is also required on shift work benefits

**HOLIDAY**

| | |
|---|---|
| Paid: | See (5, 6, 10, 13, 15) on HOLIDAY PAGE |
| Overtime: | See (5, 6, 10, 13, 15) on HOLIDAY PAGE |

Holidays falling on Sunday will be celebrated on Monday.

**REGISTERED APPRENTICES**
(1) year terms at the following percentage of journeyman's wage.

| | |
|---|---|
| 1st year | 60% of Class base wage plus $5.00* |
| 2nd year | 70% of Class base wage plus $5.00* |
| 3rd year | 80% of Class base wage plus $5.00* |
| 4th year | 90% of Class base wage plus $5.00* |

*The $5.00 is added to the Class Base Wage for all hours worked. Additionally, the $5.00 is subject to the V-Code listed on the OVERTIME CODE Sheet.

Supplemental Benefits per hour:

| | |
|---|---|
| Apprentices | $ 34.00 |

11-825SE

## Painter — 12/01/2024

**JOB DESCRIPTION** Painter **DISTRICT** 1

**ENTIRE COUNTIES**
Columbia, Dutchess, Greene, Orange, Sullivan, Ulster

**WAGES**
Per hour

| | 07/01/2024 | 05/01/2025 Additional |
|---|---|---|
| Brush/Paper Hanger | $ 38.81 | $ 1.99* |
| Dry Wall Finisher | 38.81 | 1.99* |
| Lead Abatement | 38.81 | 1.99* |
| Sandblaster-Painter | 38.81 | 1.99* |
| Spray Rate | 39.81 | 1.99* |

(*) To be allocated at later date.

See Bridge Painting rates for the following work:
Structural Steel, all work performed on tanks, ALL BRIDGES, towers, smoke stacks, flag poles. Rate shall apply to all of said areas from the ground up.

**SUPPLEMENTAL BENEFITS**
Per hour

| | |
|---|---|
| Journeyworker | $ 27.37 |

**OVERTIME PAY**
See (B, E, E2, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages per hour

Six (6) month terms at the following percentage of Journeyperson's wage

| 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|
| 50% | 55% | 65% | 75% | 85% | 95% |

Supplemental Benefits per hour worked

| | |
|---|---|
| 1st term | $ 11.39 |
| All others | 27.37 |

1-155

## Painter - Bridge & Structural Steel — 12/01/2024

**JOB DESCRIPTION** Painter - Bridge & Structural Steel **DISTRICT** 8

**ENTIRE COUNTIES**
Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

**WAGES**
Per Hour:
STEEL:

| | 07/01/2024 |
|---|---|
| Bridge Painting: | $ 56.00 |
| | + 10.35* |

ADDITIONAL $7.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (50 hour cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

**SHIFT WORK**
When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

**SUPPLEMENTAL BENEFITS**
Per Hour:
Journeyworker:

$ 12.43
+ 31.55*

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (50 hour cap).

**OVERTIME PAY**
See (B, F, R) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wage - Per hour:
Apprentices: (1) year terms.

| | |
|---|---|
| 1st year | $ 22.40 |
| | + 4.14 |
| 2nd year | $ 33.60 |
| | + 6.21 |
| 3rd year | $ 44.80 |
| | + 8.28 |

Supplemental Benefits - Per hour:

| | |
|---|---|
| 1st year | $ 1.16 |
| | + 12.62 |
| 2nd year | $ 7.46 |
| | + 18.93 |
| 3rd year | $ 9.94 |
| | + 25.24 |

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

## Painter - Line Striping — 12/01/2024

**JOB DESCRIPTION** Painter - Line Striping **DISTRICT** 8

**ENTIRE COUNTIES**
Albany, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Montgomery, Nassau, Orange, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

**WAGES**
Per hour:

| Painter (Striping-Highway): | 07/01/2024 | 04/01/2025 | 04/01/2026 |
|---|---|---|---|
| Striping-Machine Operator* | $ 34.12 | $ 35.49 | $ 36.93 |
| Linerman Thermoplastic | 41.12 | 42.74 | 44.44 |

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in the maintenance and protection of traffic safety.

**SHIFT WORK**
When directly specified in public agency or authority contract documents there shall be a 30% night shift premium pay differential for all work performed after 9:00pm and before 5:00am.

**SUPPLEMENTAL BENEFITS**
Per hour paid:
Journeyworker:

| | | | |
|---|---|---|---|
| Striping Machine Operator: | $23.65 | $ 24.30 | $ 24.95 |
| Linerman Thermoplastic: | 23.65 | 24.30 | 24.95 |

**OVERTIME PAY**
See (B, B2, E2, F, S) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 20) on HOLIDAY PAGE
Overtime: See (5, 20) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
One (1) year terms at the following wage rates:

| | | | |
|---|---|---|---|
| 1st Term: | $ 16.00 | $ 16.00 | $ 16.00 |
| 2nd Term: | 20.47 | 21.29 | 22.16 |
| 3rd Term: | 27.30 | 28.39 | 29.54 |

Supplemental Benefits per hour:

| | | | |
|---|---|---|---|
| All terms: | $ 23.65 | $ 24.30 | $ 24.95 |

8-1456-LS

## Painter - Metal Polisher — 12/01/2024

**JOB DESCRIPTION** Painter - Metal Polisher **DISTRICT** 8

**ENTIRE COUNTIES**
Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

**WAGES**

| | 07/01/2024 |
|---|---|
| Metal Polisher | $ 39.33 |
| Metal Polisher* | 40.43 |
| Metal Polisher** | 43.33 |

*Note: Applies on New Construction & complete renovation
** Note: Applies when working on scaffolds over 34 feet.

**SUPPLEMENTAL BENEFITS**
Per Hour: 07/01/2024

Journeyworker:
All classification $ 12.79

**OVERTIME PAY**
See (B, E, P, T) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
Wages per hour:
One (1) year term at the following wage rates:

| | 07/01/2024 |
|---|---|
| 1st year | $ 19.67 |
| 2nd year | 21.63 |
| 3rd year | 23.60 |
| 1st year* | $ 22.06 |

| | |
|---|---|
| 2nd year* | 22.07 |
| 3rd year* | 24.14 |
| | |
| 1st year** | $ 22.17 |
| 2nd year** | 24.13 |
| 3rd year** | 26.10 |

*Note: Applies on New Construction & complete renovation
** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:
Per hour:

| | |
|---|---|
| 1st year | $ 8.69 |
| 2nd year | 8.69 |
| 3rd year | 8.69 |

8-8A/28A-MP

## Plumber 12/01/2024

**JOB DESCRIPTION** Plumber **DISTRICT** 11

**ENTIRE COUNTIES**
Orange, Rockland, Sullivan

**PARTIAL COUNTIES**
Ulster: Only the Townships of Plattekill, Marlboro, Wawarsing, and Shawangunk (except for Wallkill and Shawangunk Prisons).

**WAGES**
REFRIGERATION: For commercial and industrial refrigeration which means service, maintenance, and installation work where the combined compressor tonnage does not exceed 40 tons.
AIR CONDITIONING: Air conditioning to be installed that is water cooled shall not exceed 25 tons. This will include the piping of the component system and erection of water tower. Air conditioning that is air cooled shall not exceed 50 tons.

WAGES: (per hour)

| | 07/01/2024 | 05/01/2025 Additional |
|---|---|---|
| Plumber | $ 40.09 | $ 2.50* |

*To be allocated at a later date

Star Certification: an additional $ 1.00 per hour over scale will be paid to all those who have Star Certification.

**SHIFT WORK**
Shift Differential: When mandated by the governmental agency, an additional 15% premium will be paid for irregular workday or for 2nd and 3rd shift.

**SUPPLEMENTAL BENEFITS**
Per hour:
Journeyman
$ 36.78*

*For overtime or shift differential work, $0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

**OVERTIME PAY**
See (B, G, P, *V) on OVERTIME PAGE
* A portion of the benefit amount is subject to the V code for overtime and shift differential work.

**HOLIDAY**
Paid: See (5, 6, 13, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 13, 15, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
(1)year terms at the following wage.

| | 07/01/2024 |
|---|---|
| 1st term | $ 18.04 |
| 2nd term | 22.05 |
| 3rd term | 26.06 |
| 4th term | 30.07 |
| 5th term | 34.08 |

Supplemental Benefits per hour:
Apprentices

| | |
|---|---|
| 1st term | $ 16.62* |
| 2nd term | 20.29* |
| 3rd term | 23.95* |
| 4th term | 27.63* |
| 5th term | 31.19* |

*For overtime or shift differential work, $0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

11-373 Refrig

## Plumber — 12/01/2024

**JOB DESCRIPTION** Plumber **DISTRICT** 11

**ENTIRE COUNTIES**
Orange, Rockland, Sullivan

**PARTIAL COUNTIES**
Ulster: Only the Townships of Plattekill, Marlboro, Wawarsing, and Shawangunk (except for Wallkill and Shawangunk Prisons).

**WAGES**

| WAGES:(per hour) | 07/01/2024 |
|---|---|
| Plumber/Steamfitter | $ 51.20 |

Note: For all work 40-60 feet above ground add $ 0.25 per hour, over 60 feet add $ 0.50 per hour.

**SHIFT WORK**
Shift Differential: When mandated by the governmental agency, an additional 15% premium will be paid for irregular workday or for 2nd and 3rd shift.

**SUPPLEMENTAL BENEFITS**
Per hour:

| | |
|---|---|
| Journeyman | $ 45.57 |

*For overtime or shift differential work, $0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

**OVERTIME PAY**
See (B, E, Q, *V) on OVERTIME PAGE
* A portion of the benefit amount is subject to the V code for overtime and shift differential work.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE
When a holiday falls on a Saturday, the day prior shall be considered and recognized as the holiday. When a holiday falls on a Sunday, the day proceeding shall be considered and recognized as the holiday to be observed.

**REGISTERED APPRENTICES**
(1) year terms at the following wages.

| | 07/01/2024 |
|---|---|
| 1st term | $ 17.92 |
| 2nd term | 23.04 |
| 3rd term | 28.16 |
| 4th term | 33.28 |
| 5th term | 40.96 |

Supplemental Benefits per hour:

| | |
|---|---|
| 1st term | $ 16.03* |
| 2nd term | 20.58* |
| 3rd term | 25.12* |
| 4th term | 29.68* |
| 5th term | 36.48* |

*For overtime or shift differential work, $0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

11-373 SF

## Roofer — 12/01/2024

**JOB DESCRIPTION** Roofer **DISTRICT** 9

**ENTIRE COUNTIES**
Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

**WAGES**

| Per Hour: | 07/01/2024 |
|---|---|
| Roofer/Waterproofer | $ 48.50<br>+ $7.00* |

* This portion is not subjected to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

**SUPPLEMENTAL BENEFITS**
Per Hour: $ 31.87

**OVERTIME PAY**
See (B, H) on OVERTIME PAGE
Note: An observed holiday that falls on a Sunday will be observed the following Monday.

**HOLIDAY**
Overtime: See (5, 6) on HOLIDAY PAGE

**REGISTERED APPRENTICES**
( 1 ) year term apprentices indentured prior to 01/01/2023

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 16.97 | $ 24.25<br>+ 3.50* | $ 29.10<br>+ 4.20* | $ 36.37<br>+ 5.26* |

Supplements:

| 1st | 2nd | 3rd | 4th |
|---|---|---|---|
| $ 4.10 | $ 16.17 | $ 19.31 | $ 24.02 |

* This portion is not subjected to overtime premiums.

(1) year term apprentices indentured after 01/01/2023

| 1st | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|
| $ 18.43 | $ 21.82<br>+ 3.16* | $ 24.25<br>+ 3.50* | $ 29.10<br>+ 4.20* | $ 36.37<br>+ 5.26 |

Supplements:

| 1st | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|
| $ 7.73 | $ 14.59 | $ 16.17 | $ 19.31 | $ 24.02 |

* This portion is not subjected to overtime premiums.

9-8R

## Sheetmetal Worker — 12/01/2024

**JOB DESCRIPTION** Sheetmetal Worker **DISTRICT** 8

**ENTIRE COUNTIES**
Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

**WAGES**

| | 07/01/2024 |
|---|---|
| SheetMetal Worker | $ 49.51<br>+ 3.71* |

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

**SHIFT WORK**
For all NYS D.O.T. and other Governmental mandated off-shift work:
10% increase for additional shifts for a minimum of five (5) days

**SUPPLEMENTAL BENEFITS**
Journeyworker $ 46.20

**OVERTIME PAY**
OVERTIME:.. See ( B, E, Q, ) on OVERTIME PAGE.

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 16, 23) on HOLIDAY PAGE

**REGISTERED APPRENTICES**

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
|---|---|---|---|---|---|---|---|
| $ 20.20<br>+ 1.48* | $ 20.81<br>+ 1.67* | $ 23.12<br>+ 1.86* | $ 25.42<br>+ 2.04* | $ 27.74<br>+ 2.23* | $ 30.08<br>+ 2.41* | $ 32.86<br>+ 2.60* | $ 35.63<br>+ 2.78* |

*This portion of the benefit is NOT subject to the SAME PREMIUM as shown for overtime.

Supplemental Benefits per hour:

| Apprentices | |
|---|---|
| 1st term | $ 18.07 |
| 2nd term | 22.24 |
| 3rd term | 24.71 |
| 4th term | 27.21 |
| 5th term | 29.67 |
| 6th term | 32.12 |
| 7th term | 34.12 |
| 8th term | 36.15 |

8-38

## Sprinkler Fitter — 12/01/2024

**JOB DESCRIPTION** Sprinkler Fitter **DISTRICT** 1

**ENTIRE COUNTIES**
Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

**WAGES**

| Per hour | 07/01/2024 |
|---|---|
| Sprinkler Fitter | $ 53.34 |

**SUPPLEMENTAL BENEFITS**

| Per hour | |
|---|---|
| Journeyworker | $ 30.77 |

**OVERTIME PAY**
See (B, E, Q) on OVERTIME PAGE

**HOLIDAY**
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE
Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

**REGISTERED APPRENTICES**
Wages per hour

One Half Year terms at the following wage.

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| $ 25.89 | $ 28.77 | $ 31.39 | $ 34.27 | $ 37.14 | $ 40.02 | $ 42.90 | $ 45.77 | $ 48.65 | $ 51.53 |

Supplemental Benefits per hour

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|---|---|---|---|---|---|---|---|---|---|
| $ 9.18 | $ 9.18 | $ 20.90 | $ 20.90 | $ 21.15 | $ 21.15 | $ 21.15 | $ 21.15 | $ 21.15 | $ 21.15 |

1-669.2

## Teamster - Building / Heavy&Highway — 12/01/2024

**JOB DESCRIPTION** Teamster - Building / Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**
Dutchess, Orange, Rockland, Sullivan, Ulster

**WAGES**
GROUP 1: LeTourneau Tractors, Double Barrel Euclids, Athney Wagons and similar equipment (except when hooked to scrapers), I-Beam and Pole Trailers, Tire Trucks, Tractor and Trailers with 5 axles and over, Articulated Back Dumps and Road Oil Distributors, Articulated Water Trucks and Fuel Trucks/Trailers, positions requiring a HAZMAT CDL endorsement.

GROUP 1A: Drivers on detachable Gooseneck Low Bed Trailers rated over 35 tons.

GROUP 2: All equipment 25 yards and up to and including 30-yard bodies and cable Dump Trailers and Powder and Dynamite Trucks.

GROUP 3: All Equipment up to and including 24-yard bodies, Mixer Trucks, Dump Crete Trucks and similar types of equipment, Fuel Trucks, Batch Trucks and all other Tractor Trailers, Hi-Rail Truck.

GROUP 4: Tri-Axles, Ten Wheelers, Grease Trucks, Tillerman, Pattern Trucks, Attenuator Trucks, Water Trucks, Bus.

GROUP 5: Straight Trucks.

GROUP 6: Pick-up Trucks for hauling materials and parts, and Escort Man over-the-road.

| WAGES: (per hour) | 07/01/2024 |
|---|---|
| GROUP 1 | $ 34.58 |
| GROUP 1A | 35.72 |
| GROUP 2 | 34.02 |
| GROUP 3 | 33.80 |
| GROUP 4 | 33.69 |
| GROUP 5 | 33.57 |
| GROUP 6 | 33.57 |

NOTE ADDITIONAL PREMIUMS:

- Employees engaged in hazardous/toxic waste removal, on a State or Federally designated hazardous/toxic waste site, where the employee comes in contact with hazardous/toxic waste material and when personal protective equipment is required for respiratory, skin, or eye protection, the employee shall receive an additional 20% premium above the hourly wage.

**SHIFT WORK**

- On projects requiring an irregular shift a premium of 10% will be paid on wages. The premium will be paid for off-shift or irregular shift work when mandated by Governmental Agency.

**SUPPLEMENTAL BENEFITS**

| Per hour: | |
|---|---|
| First 40 hours | $ 44.59 |
| Over 40 hours | 36.99 |

**OVERTIME PAY**

See (*B, E, **E2, ***P, X) on OVERTIME PAGE
*Holidays worked Monday through Friday receive Double Time (2x) after 8 hours.
**Makeup day limited to the employees who were working on the site that week.
***Sunday Holidays are paid at a rate of double time and one half (2.5x) for all hours worked.

**HOLIDAY**

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime: See (*1) on HOLIDAY PAGE

- Any employee working two (2) days in any calendar week during which a holiday occurs shall receive a days pay for each holiday occurring during said week. This provision shall also apply if a holiday falls on a Saturday or Sunday.
*See OVERTIME PAY section for when additional premium is applicable on Holiday hours worked.

11-445B/HH

## Teamster - Delivery - Building / Heavy&Highway — 12/01/2024

**JOB DESCRIPTION** Teamster - Delivery - Building / Heavy&Highway **DISTRICT** 11

**ENTIRE COUNTIES**

Dutchess, Orange, Rockland, Sullivan, Ulster

**WAGES**

Group 1 Tractor Trailer Drivers
Group 2 Tri- Axle

| Wages: | 07/01/2024 |
|---|---|
| Group 1 | $ 33.70 |
| Group 2 | 29.70 |

Hazardous/Toxic Waste Removal additional 20% when personal protective equipment is required.

**SUPPLEMENTAL BENEFITS**

| Per hour paid: | |
|---|---|
| First 40 hours | $ 32.30 |
| Over 40 hours | 0.00 |

**OVERTIME PAY**

See (B, E, Q, X) on OVERTIME PAGE

**HOLIDAY**
Paid: See (5, 13, 15, 16, 20, 22, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 13, 15, 16, 20, 22, 25, 26) on HOLIDAY PAGE
- Employee must work either the scheduled day of work before or the scheduled day of work after the holiday in the workweek.
- Any employee working one (1) day in the calendar week during which a holiday occurs shall receive a day's pay for each holiday occurring during said week. This provision shall also apply if a holiday falls on a Saturday.
- When any of the recognized holidays occur on Sunday and are celebrated any day before or after the holiday Sunday, such days shall be considered as the holiday and paid for as such.

11-445 B/HH Delivery

## Welder 12/01/2024

**JOB DESCRIPTION** Welder **DISTRICT** 1

**ENTIRE COUNTIES**
Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

**WAGES**
Per hour 07/01/2024

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

**OVERTIME PAY**

**HOLIDAY**

1-As Per Trade

## Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

| | |
|---|---|
| ( AA ) | Time and one half of the hourly rate after 7 and one half hours per day |
| ( A ) | Time and one half of the hourly rate after 7 hours per day |
| ( B ) | Time and one half of the hourly rate after 8 hours per day |
| ( B1 ) | Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday. Double the hourly rate for all additional hours |
| ( B2 ) | Time and one half of the hourly rate after 40 hours per week |
| ( B3 ) | Time and one half of the hourly rate after 40 straight hours per week |
| ( C ) | Double the hourly rate after 7 hours per day |
| ( C1 ) | Double the hourly rate after 7 and one half hours per day |
| ( D ) | Double the hourly rate after 8 hours per day |
| ( D1 ) | Double the hourly rate after 9 hours per day |
| ( E ) | Time and one half of the hourly rate on Saturday |
| ( E1 ) | Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours |
| ( E2 ) | Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather |
| ( E3 ) | Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week |
| ( E4 ) | Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather |
| ( E5 ) | Double time after 8 hours on Saturdays |
| ( F ) | Time and one half of the hourly rate on Saturday and Sunday |
| ( G ) | Time and one half of the hourly rate on Saturday and Holidays |
| ( H ) | Time and one half of the hourly rate on Saturday, Sunday, and Holidays |
| ( I ) | Time and one half of the hourly rate on Sunday |
| ( J ) | Time and one half of the hourly rate on Sunday and Holidays |
| ( K ) | Time and one half of the hourly rate on Holidays |
| ( L ) | Double the hourly rate on Saturday |
| ( M ) | Double the hourly rate on Saturday and Sunday |
| ( N ) | Double the hourly rate on Saturday and Holidays |
| ( O ) | Double the hourly rate on Saturday, Sunday, and Holidays |
| ( P ) | Double the hourly rate on Sunday |
| ( Q ) | Double the hourly rate on Sunday and Holidays |
| ( R ) | Double the hourly rate on Holidays |

| | |
|---|---|
| ( S ) | Two and one half times the hourly rate for Holidays |
| ( S1 ) | Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours. |
| ( T ) | Triple the hourly rate for Holidays |
| ( U ) | Four times the hourly rate for Holidays |
| ( V ) | Including benefits at SAME PREMIUM as shown for overtime |
| ( W ) | Time and one half for benefits on all overtime hours. |
| ( X ) | Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.) |

## Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

| | |
|---|---|
| ( 1 ) | None |
| ( 2 ) | Labor Day |
| ( 3 ) | Memorial Day and Labor Day |
| ( 4 ) | Memorial Day and July 4th |
| ( 5 ) | Memorial Day, July 4th, and Labor Day |
| ( 6 ) | New Year's, Thanksgiving, and Christmas |
| ( 7 ) | Lincoln's Birthday, Washington's Birthday, and Veterans Day |
| ( 8 ) | Good Friday |
| ( 9 ) | Lincoln's Birthday |
| ( 10 ) | Washington's Birthday |
| ( 11 ) | Columbus Day |
| ( 12 ) | Election Day |
| ( 13 ) | Presidential Election Day |
| ( 14 ) | 1/2 Day on Presidential Election Day |
| ( 15 ) | Veterans Day |
| ( 16 ) | Day after Thanksgiving |
| ( 17 ) | July 4th |
| ( 18 ) | 1/2 Day before Christmas |
| ( 19 ) | 1/2 Day before New Years |
| ( 20 ) | Thanksgiving |
| ( 21 ) | New Year's Day |
| ( 22 ) | Christmas |
| ( 23 ) | Day before Christmas |
| ( 24 ) | Day before New Year's |
| ( 25 ) | Presidents' Day |
| ( 26 ) | Martin Luther King, Jr. Day |
| ( 27 ) | Memorial Day |
| ( 28 ) | Easter Sunday |

( 29 ) Juneteenth

**New York State Department of Labor - Bureau of Public Work**
**State Office Building Campus**
**Building 12 - Room 130**
**Albany, New York 12226**

# REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

**This Form Must Be Typed**

Submitted By: (Check Only One) ☐ Contracting Agency ☐ Architect or Engineering Firm ☐ Public Work District Office Date:

## A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address ☐ (Check if new or change)

Telephone Fax

E-Mail:

2. NY State Units (see Item 5).

- ☐ 01 DOT
- ☐ 02 OGS
- ☐ 03 Dormitory Authority
- ☐ 04 State University Construction Fund
- ☐ 05 Mental Hygiene Facilities Corp.
- ☐ 06 OTHER N.Y. STATE UNIT
- ☐ 07 City
- ☐ 08 Local School District
- ☐ 09 Special Local District, i.e., Fire, Sewer, Water District
- ☐ 1O Village
- ☐ 11 Town
- ☐ 12 County
- ☐ 13 Other Non-N.Y. State (Describe)

3. SEND REPLY TO ☐ (check if new or change)
Name and complete address:

Telephone Fax

E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

☐ New Schedule of Wages and Supplements.

APPROXIMATE BID DATE :

☐ Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR THIS PROJECT :

OFFICE USE ONLY

## B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- ☐ 1. New Building
- ☐ 2. Addition to Existing Structure
- ☐ 3. Heavy and Highway Construction (New and Repair)
- ☐ 4. New Sewer or Waterline
- ☐ 5. Other New Construction (Explain)
- ☐ 6. Other Reconstruction, Maintenance, Repair or Alteration
- ☐ 7. Demolition
- ☐ 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- ☐ Construction (Building, Heavy Highway/Sewer/Water)
- ☐ Tunnel
- ☐ Residential
- ☐ Landscape Maintenance
- ☐ Elevator maintenance
- ☐ Exterminators, Fumigators
- ☐ Fire Safety Director, NYC Only
- ☐ Fuel Delivery
- ☐ Guards, Watchmen
- ☐ Janitors, Porters, Cleaners, Elevator Operators
- ☐ Moving furniture and equipment
- ☐ Trash and refuse removal
- ☐ Window cleaners
- ☐ Other (Describe)

9. Does this project comply with the Wicks Law involving separate bidding? YES ☐ NO ☐

10. Name and Title of Requester

**Signature**

SEE PAGE TWO FOR LAWS RELATING TO PUBLIC WORK CONTRACTS

NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

# LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE AWARDED ANY PUBLIC WORK CONTRACT

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

**Debarment Database:** To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: https://apps.labor.ny.gov/EDList/searchPage.do

**For inquiries please call 518-457-5589.**

## NYSDOL Bureau of Public Work Debarment List 12/06/2024

## Article 8

| AGENCY | Fiscal Officer | FEIN | EMPLOYER NAME | EMPLOYER DBA NAME | ADDRESS | DEBARMENT START DATE | DEBARMENT END DATE |
|---|---|---|---|---|---|---|---|
| DOL | DOL | *****5754 | 0369 CONTRACTORS, LLC | | 515 WEST AVE UNIT PH 13NORWALK CT 06850 | 05/12/2021 | 05/12/2026 |
| DOL | DOL | *****5784 | A.J.M. TRUCKING, INC. | | PO BOX 2064 MONROE NY 10950 | 02/12/2024 | 02/12/2029 |
| DOL | DOL | | AKHLAQ OULAKH | | 4307 28TH AVE ASTORIA NY 11103 | 10/11/2024 | 10/11/2029 |
| DOL | NYC | | ALL COUNTY SEWER & DRAIN, INC. | | 7 GREENFIELD DR WARWICK NY 10990 | 03/25/2022 | 03/25/2027 |
| DOL | DOL | *****8387 | AMERICAN PAVING & MASONRY, CORP. | | 8 FOREST AVE GLEN COVE NY 11542 | 05/24/2024 | 05/24/2029 |
| DOL | DOL | *****8654 | AMERICAN PAVING, INC. | | 8 FORREST AVE. GLEN COVE NY 11542 | 05/24/2024 | 05/24/2029 |
| DOL | NYC | | AMJED PARVEZ | | 401 HANOVER AVENUE STATEN ISLAND NY 10304 | 01/11/2021 | 01/11/2026 |
| DOL | DOL | | ANGELO F COKER | | 2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | | ANGELO GARCIA | | 515 WEST AVE UNIT PH 13NORWALK CT 06850 | 05/12/2021 | 05/12/2026 |
| DOL | DOL | | ANGELO STANCO | | 8 FOREST AVE. GLEN COVE NY 11542 | 05/24/2024 | 05/24/2029 |
| DOL | DOL | | ANGELO TONDO | | 449 WEST MOMBSHA ROAD MONROE NY 10950 | 06/06/2022 | 06/06/2027 |
| DOL | DOL | *****4231 | ANKER'S ELECTRIC SERVICE, INC. | | 10 SOUTH 5TH ST LOCUST VALLEY NY 11560 | 09/26/2022 | 09/26/2027 |
| DOL | DOL | | ANTHONY MONGELLI | | PO BOX 2064 MONROE NY 10950 | 02/12/2024 | 02/12/2029 |
| DOL | NYC | | ARADCO CONSTRUCTION CORP | | 115-46 132RD ST SOUTH OZONE PARK NY 11420 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | | ARNOLD A. PAOLINI | | 1250 BROADWAY ST BUFFALO NY 14212 | 02/03/2020 | 02/03/2025 |
| DOL | NYC | | AVM CONSTRUCTION CORP | | 117-72 123RD ST SOUTH OZONE PARK NY 11420 | 09/17/2020 | 09/17/2025 |
| DOL | NYC | | AZIDABEGUM | | 524 MCDONALD AVENUE BROOKLYN NY 11218 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | *****8421 | B & B DRYWALL, INC | | 206 WARREN AVE APT 1WHITE PLAINS NY 10603 | 12/14/2021 | 12/14/2026 |
| DOL | DOL | | B&L RENOVATION CO. | | 618 OCEAN PARKWAY APT A6BROOKLYN NY 11230 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | | BERNARD BEGLEY | | 38 LONG RIDGE ROAD BEDFORD NY 10506 | 12/18/2019 | 12/18/2024 |
| DOL | NYC | *****2113 | BHW CONTRACTING, INC. | | 401 HANOVER AVENUE STATEN ISLAND NY 10304 | 01/11/2021 | 01/11/2026 |
| DOL | DOL | *****3627 | BJB CONSTRUCTION CORP. | | 38 LONG RIDGE ROAD BEDFORD NY 10506 | 12/18/2019 | 12/18/2024 |
| DOL | DOL | *****5078 | BLACK RIVER TREE REMOVAL, LLC | | 29807 ANDREWS ROAD BLACK RIVER NY 13032 | 10/17/2023 | 10/17/2028 |
| DOL | DOL | | BRADLEY J SCHUKA | | 4 BROTHERS ROAD WAPPINGERS FALLS NY 12590 | 10/20/2020 | 10/20/2025 |
| DOL | DOL | *****9383 | C.C. PAVING AND EXCAVATING, INC. | | 2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | *****4083 | C.P.D. ENTERPRISES, INC | | P.O BOX 281 WALDEN NY 12586 | 03/03/2020 | 03/03/2025 |
| DOL | DOL | *****5161 | CALADRI DEVELOPMENT CORP. | | 1223 PARK ST. PEEKSKILL NY 10566 | 05/17/2021 | 05/17/2026 |
| DOL | DOL | *****3391 | CALI ENTERPRISES, INC. | | 1223 PARK STREET PEEKSKILL NY 10566 | 05/17/2021 | 05/17/2026 |
| DOL | DOL | *****4155 | CASA BUILDERS, INC. | FRIEDLANDER CONSTRUCTION | 64 N PUTT CONNERS ROAD NEW PALTZ NY 12561 | 05/10/2023 | 05/10/2028 |
| DOL | AG | *****7247 | CENTURY CONCRETE CORP | | 2375 RAYNOR ST RONKONKOMA NY 11779 | 08/04/2021 | 08/04/2026 |
| DOL | DOL | *****0026 | CHANTICLEER CONSTRUCTION LLC | | 4 BROTHERS ROAD WAPPINGERS FALLS NY 12590 | 10/20/2020 | 10/20/2025 |
| DOL | NYC | *****2117 | CHARAN ELECTRICAL ENTERPRISES | | 9-11 40TH AVENUE LONG ISLAND CITY NY 11101 | 09/26/2023 | 09/26/2028 |
| DOL | NYC | | CHARLES ZAHRADKA | | 863 WASHINGTON STREET FRANKLIN SQUARE NY 11010 | 03/10/2020 | 03/10/2025 |
| DOL | DOL | | CHRISTOPHER GRECO | | 26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956 | 02/18/2021 | 02/18/2026 |

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| DOL | DOL | *****2281 | CORRAO TRUCKING, INC. | | PO BOX 393<br>NANUET NY 10954 | 09/17/2024 | 09/17/2029 |
| DOL | DOL | | CRAIG JOHANSEN | | 10 SOUTH 5TH ST<br>LOCUST VALLEY NY 11560 | 09/26/2022 | 09/26/2027 |
| DOL | DOL | *****3228 | CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC. | ROCKLAND TREE SERVICE | 26 NORTH MYRTLE AVENUE<br>SPRING VALLEY NY 10956 | 02/18/2021 | 02/18/2026 |
| DOL | DOL | *****7619 | DANCO CONSTRUCTION UNLIMITED INC. | | 485 RAFT AVENUE<br>HOLBROOK NY 11741 | 10/19/2021 | 10/19/2026 |
| DOL | DOL | | DANIEL ROBERT MCNALLY | | 7 GREENFIELD DRIVE<br>WARWICK NY 10990 | 03/25/2022 | 03/25/2027 |
| DOL | DOL | | DARIAN L COKER | | 2610 SOUTH SALINA ST<br>SUITE 2CSYRACUSE NY 13205 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | | DARWIN PEGUESE | | 6400 BALTIMORE NATIONAL<br>SUITE 602CANTONSVILLE NY 21228 | 10/24/2024 | 10/24/2029 |
| DOL | DOL | | DAVID FRIEDLANDER | | 64 NORTH PUTT CORNERS RD<br>NEW PALTZ NY 12561 | 05/10/2023 | 05/10/2028 |
| DOL | DOL | | DINA TAYLOR | | 64 N PUTT CONNERS RD<br>NEW PALTZ NY 12561 | 05/10/2023 | 05/10/2028 |
| DOL | DOL | *****5175 | EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC | | 11371 RIDGE RD<br>WOLCOTT NY 14590 | 02/03/2020 | 02/03/2025 |
| DOL | AG | | EDWIN HUTZLER | | 23 NORTH HOWELLS RD<br>BELLPORT NY 11713 | 08/04/2021 | 08/04/2026 |
| DOL | DA | | EDWIN HUTZLER | | 2375 RAYNOR STREET<br>RONKONKOMA NY 11779 | 08/04/2021 | 08/04/2026 |
| DOL | DOL | *****0780 | EMES HEATING & PLUMBING CONTR | | 5 EMES LANE<br>MONSEY NY 10952 | 01/20/2002 | 01/20/3002 |
| DOL | DOL | | EMIL KISZKO | | 84 DIAMOND ST<br>BROOKLYN NY 11222 | 07/18/2024 | 07/18/2029 |
| DOL | DOL | *****3298 | EMJACK CONSTRUCTION CORP. | | 84 DIAMOND ST<br>BROOKLYN NY 11222 | 07/18/2024 | 07/18/2029 |
| DOL | DOL | *****3298 | EMJACK CONSTRUCTION LLC | | 4192 SIR ANDREW CIRCLE<br>DOYLESTOWN PA 18902 | 07/18/2024 | 07/18/2029 |
| DOL | DOL | | EUGENIUSZ "GINO" KUCHAR | | 195 KINGSLAND AVE<br>BROOKLYN NY 11222 | 12/22/2023 | 12/22/2028 |
| DOL | DA | | FREDERICK HUTZLER | | 2375 RAYNOR STREET<br>RONKONKOMA NY 11779 | 08/04/2021 | 08/04/2026 |
| DOL | DOL | *****2998 | G.E.M. AMERICAN CONSTRUCTION CORP. | | 195 KINGSLAND AVE<br>BROOKLYN NY 11222 | 12/22/2023 | 12/22/2028 |
| DOL | NYC | | GAYATRI MANGRU | | 21 DAREWOOD LANE<br>VALLEY STREAM NY 11581 | 09/17/2020 | 09/17/2025 |
| DOL | DA | | GEORGE LUCEY | | 150 KINGS STREET<br>BROOKLYN NY 11231 | 01/19/1998 | 01/19/2998 |
| DOL | DA | | GIOVANNA TRAVALJA | | 3735 9TH ST<br>LONG ISLAND CITY NY 11101 | 01/05/2023 | 01/05/2028 |
| DOL | DA | | GIOVANNI NAPOLITANO | | 2501 BAYVIEW AVENUE<br>WANTAGH NY 11793 | 02/21/2024 | 02/21/2029 |
| DOL | DA | *****0213 | GORILLA CONTRACTING GROUP, LLC | | 505 MANHATTAN AVE<br>WEST BABYLON NY 11704 | 10/05/2023 | 10/05/2028 |
| DOL | DA | *****4760 | GTX CONSTRUCTION ASSOCIATES, CORP | | 2501 BAYVIEW AVE<br>WANTAGH NY 11793 | 02/21/2024 | 02/21/2029 |
| DOL | DOL | | HANS RATH | | 24 ELDOR AVENUE<br>NEW CITY NY 10956 | 02/03/2020 | 02/03/2025 |
| DOL | DOL | | HERBERT CLEMEN | | 42 FOWLER AVENUE<br>CORTLAND MANOR NY 10567 | 01/24/2023 | 01/24/2028 |
| DOL | DOL | | HERBERT CLEMEN | | 42 FOWLER AVENUE<br>CORTLAND MANOR NY 10567 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | *****2397 | ISLAND BREEZE MARINE, INC. | | 6400 BALTIMORE NATIONAL<br>CANTONSVILLE MD 21228 | 10/24/2024 | 10/24/2029 |
| DOL | DOL | *****9211 | J. WASE CONSTRUCTION CORP. | | 8545 RT 9W<br>ATHENS NY 12015 | 03/09/2021 | 03/09/2026 |
| DOL | DOL | | J.M.J CONSTRUCTION | | 151 OSTRANDER AVENUE<br>SYRACUSE NY 13205 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | J.R. NELSON CONSTRUCTION | | 531 THIRD STREET<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |
| DOL | DOL | | J.R. NELSON CONSTRUCTION | | 531 THIRD STREET<br>ALBANY NY 12206 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | | J.R. NELSON CONSTRUCTION | | 531 THIRD STREET<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | | J.R. NELSON, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | | J.R. NELSON, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |

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| DOL | DOL | | J.R. NELSON, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | | J.R.N COMPANIES, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 12/12/2022 | 12/12/2027 |
| DOL | DOL | | J.R.N COMPANIES, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |
| DOL | DOL | | J.R.N COMPANIES, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | *****1147 | J.R.N. CONSTRUCTION, LLC | | 531 THIRD ST<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |
| DOL | DOL | *****1147 | J.R.N. CONSTRUCTION, LLC | | 531 THIRD ST<br>ALBANY NY 12206 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | *****1147 | J.R.N. CONSTRUCTION, LLC | | 531 THIRD ST<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | | JAMES J. BAKER | | 7901 GEE ROAD<br>CANASTOTA NY 13032 | 08/17/2021 | 08/17/2026 |
| DOL | DOL | | JASON P. RACE | | 3469 STATE RT. 69<br>PERISH NY 13131 | 09/29/2021 | 09/29/2026 |
| DOL | DOL | | JASON P. RACE | | 3469 STATE RT. 69<br>PERISH NY 13131 | 02/09/2022 | 02/09/2027 |
| DOL | DOL | | JASON P. RACE | | 3469 STATE RT. 69<br>PERISH NY 13131 | 11/15/2022 | 11/15/2027 |
| DOL | DOL | | JASON P. RACE | | 3469 STATE RT. 69<br>PERISH NY 13131 | 03/01/2022 | 03/01/2027 |
| DOL | DOL | *****7993 | JBS DIRT, INC. | | 7901 GEE ROAD<br>CANASTOTA NY 13032 | 08/17/2021 | 08/17/2026 |
| DOL | DOL | *****2435 | JEFFEL D. JOHNSON | JMJ7 AND SON | 5553 CAIRNSTRAIL<br>CLAY NY 13041 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JEFFEL JOHNSON ELITE CARPENTER REMODEL AND CONSTRUCTION | | C2 EVERGREEN CIRCLE<br>LIVERPOOL NY 13090 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | *****2435 | JEFFREY M. JOHNSON | JMJ7 AND SON | 5553 CAIRNS TRAIL<br>CLAY NY 13041 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JIM PLAUGHER | | 17613 SANTE FE LINE ROAD<br>WAYNEFIELD OH 45896 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | JMJ7 & SON CONSTRUCTION, LLC | | 5553 CAIRNS TRAIL<br>LIVERPOOL NY 13041 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JMJ7 AND SONS CONTRACTORS | | 5553 CAIRNS TRAIL<br>CLAY NY 13041 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JMJ7 CONTRACTORS | | 7014 13TH AVENUE<br>BROOKLYN NY 11228 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JMJ7 CONTRACTORS AND SONS | | 5553 CAIRNS TRAIL<br>CLAY NY 13041 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JMJ7 CONTRACTORS, LLC | | 5553 CAIRNS TRAIL<br>CLAY NY 13041 | 11/21/2022 | 11/21/2027 |
| DOL | DOL | | JOHN MARKOVIC | | 47 MANDON TERRACE<br>HAWTHORN NJ 07506 | 03/29/2021 | 03/29/2026 |
| DOL | DOL | | JOHN WASE | | 8545 RT 9W<br>ATHENS NY 12015 | 03/09/2021 | 03/09/2026 |
| DOL | DOL | | JORGE RAMOS | | 8970 MIKE GARCIA DR<br>MANASSAS VA 20109 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | JOSEPH K. SALERNO | | 1010 TILDEN AVE<br>UTICA NY 13501 | 07/24/2023 | 07/24/2028 |
| DOL | DOL | | JOSEPH K. SALERNO II | | 1010 TILDEN AVE<br>UTICA NY 13501 | 07/24/2023 | 07/24/2028 |
| DOL | DOL | *****5116 | JP RACE PAINTING, INC. T/A RACE PAINTING | | 3469 STATE RT. 69<br>PERISH NY 13131 | 02/09/2022 | 02/09/2027 |
| DOL | DOL | *****5116 | JP RACE PAINTING, INC. T/A RACE PAINTING | | 3469 STATE RT. 69<br>PERISH NY 13131 | 11/15/2022 | 11/15/2027 |
| DOL | DOL | *****5116 | JP RACE PAINTING, INC. T/A RACE PAINTING | | 3469 STATE RT. 69<br>PERISH NY 13131 | 09/29/2021 | 09/29/2026 |
| DOL | DOL | *****5116 | JP RACE PAINTING, INC. T/A RACE PAINTING | | 3469 STATE RT. 69<br>PERISH NY 13131 | 03/01/2022 | 03/01/2027 |
| DOL | DOL | *****5116 | JP RACE PAINTING, INC. T/A RACE PAINTING | | 3469 STATE RT. 69<br>PERISH NY 13131 | 03/01/2022 | 03/01/2027 |
| DOL | DOL | | JRN CONSTRUCTION CO, LLC | | 1024 BROADWAY<br>ALBANY NY 12204 | 11/07/2023 | 11/07/2028 |
| DOL | DOL | *****1147 | JRN CONSTRUCTION, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | *****1147 | JRN CONSTRUCTION, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | *****1147 | JRN CONSTRUCTION, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |
| DOL | DOL | | JRN PAVING, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |

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| DOL | DOL | | JRN PAVING, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | | JRN PAVING, LLC | | 531 THIRD STREET<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |
| DOL | DOL | | JULIUS AND GITA BEHREND | | 5 EMES LANE<br>MONSEY NY 10952 | 11/20/2002 | 11/20/3002 |
| DOL | DOL | | KARIN MANGIN | | 796 PHELPS ROAD<br>FRANKLIN LAKES NJ 07417 | 12/01/2020 | 12/01/2025 |
| DOL | DOL | | KATE E. CONNOR | | 7088 INTERSTATE ISLAND RD<br>SYRACUSE NY 13209 | 03/31/2021 | 03/31/2026 |
| DOL | DOL | | KEAN INDUSTRIES, LLC | | 2345 RT. 52<br>SUITE 2NHOPEWELL<br>JUNCTION NY 12533 | 12/18/2023 | 12/18/2028 |
| DOL | DOL | *****2959 | KELC DEVELOPMENT, INC | | 7088 INTERSTATE ISLAND RD<br>SYRACUSE NY 13209 | 03/31/2021 | 03/31/2026 |
| DOL | DOL | | KIMBERLY F. BAKER | | 7901 GEE ROAD<br>CANASTOTA NY 13032 | 08/17/2021 | 08/17/2026 |
| DOL | DOL | | KMA GROUP II, INC. | | 29-10 38TH AVENUE<br>LONG ISLAND CITY NY 11101 | 10/11/2023 | 10/11/2028 |
| DOL | DOL | *****1833 | KMA GROUP INC. | | 29-10 38TH AVENUE<br>LONG ISLAND CITY NY 11101 | 10/11/2023 | 10/11/2028 |
| DOL | DOL | | KMA INSULATION, INC. | | 29-10 38TH AVENUE<br>LONG ISLAND CITY NY 11101 | 10/11/2023 | 10/11/2028 |
| DOL | DOL | | KRIN HEINEMANN | | 2345 ROUTE 52, SUITE 2N<br>HOPEWELL JUNCTION NY<br>12533 | 12/18/2023 | 12/18/2028 |
| DOL | NYC | | KULWANT S. DEOL | | 9-11 40TH AVENUE<br>LONG ISLAND CITY NY 11101 | 09/26/2023 | 09/26/2028 |
| DOL | DA | *****8816 | LAKE CONSTRUCTION AND<br>DEVELOPMENT<br>CORPORATION | | 150 KINGS STREET<br>BROOKLYN NY 11231 | 08/19/1998 | 08/19/2998 |
| DOL | DOL | | LEROY E. NELSON JR | | 531 THIRD ST<br>ALBANY NY 12206 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | | LEROY E. NELSON JR | | 531 THIRD ST<br>ALBANY NY 12206 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | | LEROY E. NELSON JR | | 531 THIRD ST<br>ALBANY NY 12206 | 11/07/2023 | 11/07/2028 |
| DOL | AG | *****3291 | LINTECH ELECTRIC, INC. | | 3006 TILDEN AVE<br>BROOKLYN NY 11226 | 02/16/2022 | 02/16/2027 |
| DOL | DOL | | LOUIS A. CALICCHIA | | 1223 PARK ST.<br>PEEKSKILL NY 10566 | 05/17/2021 | 05/17/2026 |
| DOL | NYC | | LUBOMIR PETER SVOBODA | | 27 HOUSMAN AVE<br>STATEN ISLAND NY 10303 | 12/26/2019 | 12/26/2024 |
| DOL | NYC | | M & L STEEL & ORNAMENTAL<br>IRON CORP. | | 27 HOUSMAN AVE<br>STATEN ISLAND NY 10303 | 12/26/2019 | 12/26/2024 |
| DOL | DOL | *****2196 | MAINSTREAM SPECIALTIES,<br>INC. | | 11 OLD TOWN RD<br>SELKIRK NY 12158 | 02/02/2021 | 02/02/2026 |
| DOL | DA | | MANUEL P TOBIO | | 150 KINGS STREET<br>BROOKLYN NY 14444 | 08/19/1998 | 08/19/2998 |
| DOL | DA | | MANUEL TOBIO | | 150 KINGS STREET<br>BROOKLYN NY 11231 | 08/19/1998 | 08/19/2998 |
| DOL | DOL | | MAQSOOD AHMAD | | 618 OCEAN PKWY<br>BROOKLYN NY 11230 | 09/17/2020 | 09/17/2025 |
| DOL | NYC | | MARIA NUBILE | | 84-22 GRAND AVENUE<br>ELMHURST NY 11373 | 03/10/2020 | 03/10/2025 |
| DOL | DOL | *****1320 | MJC MASON CONTRACTING,<br>INC. | | 42 FOWLER AVENUE<br>CORTLAND MANOR NY 10567 | 10/25/2022 | 10/25/2027 |
| DOL | DOL | *****1320 | MJC MASON CONTRACTING,<br>INC. | | 42 FOWLER AVENUE<br>CORTLAND MANOR NY 10567 | 01/24/2023 | 01/24/2028 |
| DOL | NYC | | MUHAMMED A. HASHEM | | 524 MCDONALD AVENUE<br>BROOKLYN NY 11218 | 09/17/2020 | 09/17/2025 |
| DOL | NYC | | NAMOW, INC. | | 84-22 GRAND AVENUE<br>ELMHURST NY 11373 | 03/10/2020 | 03/10/2025 |
| DOL | DOL | *****7790 | NATIONAL BUILDING &<br>RESTORATION CORP | | 1010 TILDEN AVE<br>UTICA NY 13501 | 07/24/2023 | 07/24/2028 |
| DOL | DOL | *****1797 | NATIONAL CONSTRUCTION<br>SERVICES, INC | | 1010 TILDEN AVE<br>UTICA NY 13501 | 07/24/2023 | 07/24/2028 |
| DOL | NYC | | NAVIT SINGH | | 402 JERICHO TURNPIKE<br>NEW HYDE PARK NY 11040 | 08/10/2022 | 08/10/2027 |
| DOL | DOL | | NELCO CONTRACTING, LLC | | 1024 BROADWAY<br>ALBANY NY 12204 | 11/07/2023 | 11/07/2028 |
| DOL | DA | | NICHOLAS T. ANALITIS | | 505 MANHATTAN AVE<br>WEST BABYLON NY 11704 | 10/05/2023 | 10/05/2028 |
| DOL | DOL | | NICHOLE E. FRASER A/K/A<br>NICHOLE RACE | | 3469 STATE RT. 69<br>PERISH NY 13131 | 03/01/2022 | 03/01/2027 |

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| DOL | DOL | | NICHOLE E. FRASER A/K/A NICHOLE RACE | | 3469 STATE RT. 69 PERISH NY 13131 | 11/15/2022 | 11/15/2027 |
| DOL | DOL | | NICHOLE E. FRASER A/K/A NICHOLE RACE | | 3469 STATE RT. 69 PERISH NY 13131 | 09/29/2021 | 09/29/2026 |
| DOL | DOL | | NICHOLE E. FRASER A/K/A NICHOLE RACE | | 3469 STATE RT. 69 PERISH NY 13131 | 02/09/2022 | 02/09/2027 |
| DOL | DOL | *****7429 | NICOLAE I. BARBIR | BESTUCCO CONSTRUCTION, INC. | 444 SCHANTZ ROAD ALLENTOWN PA 18104 | 09/17/2020 | 09/17/2025 |
| DOL | NYC | *****5643 | NYC LINE CONTRACTORS, INC. | | 402 JERICHO TURNPIKE NEW HYDE PARK NY 11040 | 08/10/2022 | 08/10/2027 |
| DOL | DOL | | PATRICK PENNACCHIO | | 2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533 | 12/18/2023 | 12/18/2028 |
| DOL | DOL | | PATRICK PENNACCHIO | | 2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533 | 12/18/2023 | 12/18/2028 |
| DOL | DOL | | PAULINE CHAHALES | | 935 S LAKE BLVD MAHOPAC NY 10541 | 03/02/2021 | 03/02/2026 |
| DOL | DOL | | PETER STEVENS | | 11 OLD TOWN ROAD SELKIRK NY 12158 | 02/02/2021 | 02/02/2026 |
| DOL | DOL | | PETER STEVENS | | 8269 21ST ST BELLEROSE NY 11426 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | *****4168 | PHANTOM CONSTRUCTION CORP. | | 95-27 116TH STREET QUEENS NY 11419 | 07/12/2024 | 07/12/2029 |
| DOL | DOL | *****4168 | PHANTOM CONSTRUCTION CORP. | | 95-27 116TH STREET QUEENS NY 11419 | 05/28/2024 | 05/28/2029 |
| DOL | DOL | *****0466 | PRECISION BUILT FENCES, INC. | | 1617 MAIN ST PEEKSKILL NY 10566 | 03/03/2020 | 03/03/2025 |
| DOL | NYC | | RASHEL CONSTRUCTION CORP | | 524 MCDONALD AVENUE BROOKLYN NY 11218 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | *****1068 | RATH MECHANICAL CONTRACTORS, INC. | | 24 ELDOR AVENUE NEW CITY NY 10956 | 02/03/2020 | 02/03/2025 |
| DOL | DOL | *****2633 | RAW POWER ELECTRIC CORP. | | 3 PARK CIRCLE MIDDLETOWN NY 10940 | 07/11/2022 | 07/11/2027 |
| DOL | DA | *****7559 | REGAL CONTRACTING INC. | | 24 WOODBINE AVE NORTHPORT NY 11768 | 10/01/2020 | 10/01/2025 |
| DOL | DOL | | RICHARD REGGIO | | 1617 MAIN ST PEEKSKILL NY 10566 | 03/03/2020 | 03/03/2025 |
| DOL | DOL | | ROBBYE BISSESAR | | 89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427 | 01/11/2003 | 01/11/3003 |
| DOL | DOL | | ROMEO WARREN | | 161 ROBYN RD MONROE NY 10950 | 07/11/2022 | 07/11/2027 |
| DOL | DOL | *****7172 | RZ & AL INC. | | 198 RIDGE AVENUE VALLEY STREAM NY 11581 | 06/06/2022 | 06/06/2027 |
| DOL | DOL | | SAL FRESINA MASONRY CONTRACTORS, INC. | | 1935 TEALL AVENUE SYRACUSE NY 13206 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | SAL MASONRY CONTRACTORS, INC. | | (SEE COMMENTS) SYRACUSE NY 13202 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | *****9874 | SALFREE ENTERPRISES INC | | P.O BOX 14 2821 GARDNER RDPOMPEI NY 13138 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | SALVATORE A FRESINA A/K/A SAM FRESINA | | 107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | SAM FRESINA | | 107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218 | 07/16/2021 | 07/16/2026 |
| DOL | DA | *****0476 | SAMCO ELECTRIC CORP. | | 3735 9TH ST LONG ISLAND CITY NY 11101 | 01/05/2023 | 01/05/2028 |
| DOL | NYC | *****1130 | SCANA CONSTRUCTION CORP. | | 863 WASHINGTON STREET FRANKLIN SQUARE NY 11010 | 03/10/2020 | 03/10/2025 |
| DOL | DOL | *****2045 | SCOTT DUFFIE | DUFFIE'S ELECTRIC, INC. | P.O BOX 111 CORNWALL NY 12518 | 03/03/2020 | 03/03/2025 |
| DOL | DOL | | SCOTT DUFFIE | | P.O BOX 111 CORNWALL NY 12518 | 03/03/2020 | 03/03/2025 |
| DOL | DA | | SILVANO TRAVALJA | | 3735 9TH ST LONG ISLAND CITY NY 11101 | 01/05/2023 | 01/05/2028 |
| DOL | DOL | *****0440 | SOLAR GUYS INC. | | 8970 MIKE GARCIA DR MANASSAS VA 20109 | 07/16/2021 | 07/16/2026 |
| DOL | NYC | | SOMATIE RAMSUNAHAI | | 115-46 132ND ST SOUTH OZONE PARK NY 11420 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | *****2221 | SOUTH BUFFALO ELECTRIC, INC. | | 1250 BROADWAY ST BUFFALO NY 14212 | 02/03/2020 | 02/03/2025 |

## NYSDOL Bureau of Public Work Debarment List 12/06/2024

## Article 8

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DOL | NYC | *****3661 | SPANIER BUILDING MAINTENANCE CORP | | 200 OAK DRIVE SYOSSET NY 11791 | 03/14/2022 | 03/14/2027 |
| DOL | DOL | | STANADOS KALOGELAS | | 485 RAFT AVENUE HOLBROOK NY 11741 | 10/19/2021 | 10/19/2026 |
| DOL | DOL | *****3496 | STAR INTERNATIONAL INC | | 89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427 | 08/11/2003 | 08/11/3003 |
| DOL | DOL | *****9528 | STEEL-IT, LLC. | | 17613 SANTE FE LINE ROAD WAYNESFIELD OH 45896 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | *****3800 | SUBURBAN RESTORATION CO. INC. | | 5-10 BANTA PLACE FAIR LAWN PLACE NJ 07410 | 03/29/2021 | 03/29/2026 |
| DOL | DOL | *****9150 | SURGE INC. | | 8269 21ST STREET BELLEROSE NY 11426 | 12/22/2022 | 12/22/2027 |
| DOL | DOL | | SYED MUHAMMAD S. JAFRI A/K/A SHARRUKH JAFRI | | 4307 28TH AVE ASTORIA NY 11103 | 10/11/2024 | 10/11/2029 |
| DOL | DOL | | SYED RAZA | | 198 RIDGE AVENUE NY 11581 | 06/06/2022 | 06/06/2027 |
| DOL | DOL | | TARLOK SINGH | | 95-27 116TH STREET QUEENS NY 11419 | 05/28/2024 | 05/28/2029 |
| DOL | DOL | | TARLOK SINGH | | 95-27 116TH STREET QUEENS NY 11419 | 07/12/2024 | 07/12/2029 |
| DOL | DOL | | TERRY THOMPSON | | 11371 RIDGE RD WOLCOTT NY 14590 | 02/03/2020 | 02/03/2025 |
| DOL | DOL | *****9733 | TERSAL CONSTRUCTION SERVICES INC | | 107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13208 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | TERSAL CONTRACTORS, INC. | | 221 GARDNER RD P.O BOX 14POMPEI NY 13138 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | | TERSAL DEVELOPMENT CORP. | | 1935 TEALL AVENUE SYRACUSE NY 13206 | 07/16/2021 | 07/16/2026 |
| DOL | DOL | *****5766 | THE COKER CORPORATION | COKER CORPORATIO N | 2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | *****2426 | THE MATRUKH GROUP, INC. | | 4307 28TH AVE PO BOX 9082ASTORIA NY 11103 | 10/11/2024 | 10/11/2029 |
| DOL | DOL | | TIMOTHY PERCY | | 29807 ANDREWS ROAD BLACK RIVER NY 13612 | 10/17/2023 | 10/17/2028 |
| DOL | DA | *****1050 | TRI STATE CONSTRUCTION OF NY CORP. | | 50-39 175TH PLACE FRESH MEADOWS NY 11365 | 03/28/2022 | 03/28/2027 |
| DOL | DA | *****4106 | TRIPLE H CONCRETE CORP | | 2375 RAYNOR STREET RONKONKOMA NY 11779 | 08/04/2021 | 08/04/2026 |
| DOL | DOL | *****8210 | UPSTATE CONCRETE & MASONRY CONTRACTING CO INC | | 449 WEST MOMBSHA ROAD MONROE NY 10950 | 06/06/2022 | 06/06/2027 |
| DOL | DOL | *****6418 | VALHALLA CONSTRUCTION, LLC. | | 796 PHLEPS ROAD FRANKLIN LAKES NJ 07417 | 12/01/2020 | 12/01/2025 |
| DOL | NYC | *****2426 | VICKRAM MANGRU | VICK CONSTRUCTI ON | 21 DAREWOOD LANE VALLEY STREAM NY 11581 | 09/17/2020 | 09/17/2025 |
| DOL | NYC | | VICKRAM MANGRU | | 21 DAREWOOD LANE VALLEY STREAM NY 11581 | 09/17/2020 | 09/17/2025 |
| DOL | DOL | | VIKTORIA RATH | | 24 ELDOR AVENUE NEW CITY NY 10956 | 02/03/2020 | 02/03/2025 |
| DOL | DOL | | VINCENT CORRAO | | PO BOX 393 NANUET NY 10954 | 09/17/2024 | 09/17/2029 |
| DOL | DOL | *****8266 | WILLIAM CHRIS MCCLENDON | MCCLENDON ASPHALT PAVING | 1646 FALLS STREET NIAGARA FALLS NY 14303 | 05/01/2023 | 05/01/2028 |
| DOL | DOL | | WILLIAM CHRIS MCCLENDON | | 1646 FALLS STREET NIAGARA FALLS NY 14303 | 05/01/2023 | 05/01/2028 |
| DOL | DOL | | WILLIAM G. PROERFRIEDT | | 85 SPRUCEWOOD ROAD WEST BABYLON NY 11704 | 01/19/2021 | 01/19/2026 |
| DOL | DOL | *****5924 | WILLIAM G. PROPHY, LLC | WGP CONTRACTIN G, INC. | 54 PENTAQUIT AVE BAYSHORE NY 11706 | 01/19/2021 | 01/19/2026 |
| DOL | DOL | | WILLIAM SCRIVENS | | 4192 SIR ANDREW CIRCLE DOYELSTOWN PA 18902 | 07/18/2024 | 07/18/2029 |
| DOL | DOL | | XENOFON EFTHIMIADIS | | 29-10 38TH AVENUE LONG ISLAND CITY NY 11101 | 10/11/2023 | 10/11/2028 |

**SECTION 01 10 00**
**SUMMARY**

**PART 1 GENERAL**

**PROJECT**

Project Name: Town of Montgomery Police Station

Architect's Name: Jason T. Anderson Architect, P.C. dba ADG Architects.

The Project consists of the construction of new Police Station:

First Floor:
6,597 s.f. Police Station
1,881 s.f. Offices, Mechanical Room, Storage and Conference Room.

General Code Data:
Occupancy Classification:
1) Occupancy classification:
Police Station: B
Conference Room: A-3
Mech/Plumbing: U
Construction Classification: Type IIB

Structure:
1. Footings/Foundation: Spread footings over compacted soil.
2. 1st Floor: Concrete slab on grade.
3. 2nd Floor: Steel frame
4. Roof: EPDM w/metal roof at canopies
5. General: Steel frame with ACM and masonry veneer facade.

Egress:
1. 1st Floor: Doors to grade or exterior stair; accessible - 100%
2. 2nd Floor: Exit access stair to first floor, not accessible

Additional Construction Documents:
1. Specification Book
2. Geotechnical Report
3. ComCheck

**CONTRACT DESCRIPTION**

Contract Type: A single prime contract based on a Stipulated Price.

The work is identified in the Technical Specifications and on the Construction Plans. The Contractor will make application for and include all permitting fees required by the AHJ for this project.

It is the intent of the Construction Plans and Technical Specifications to provide alterations and/or new construction as indicated on the Construction Plans and in the Technical Specifications to provide complete systems in every respect, capable of operating as designed. It is not intended that every fitting, minor detail or feature be shown on Construction Plans. The Contractor shall be responsible for any detail necessary for completion of these systems, in accordance with good practice and standard of care for this region. Installation shall be executed so as to contribute to efficiency of operation, minimum maintenance, accessibility and sight lines. The installation shall conform and accommodate itself to the building structure, its equipment and its usage. No piping or equipment shall be installed in such a manner as to interfere with the operation of any doors or

windows. Requirements specified herein shall govern the applicable portion of all sections, whether so stated herein or not.

The Contractor shall be advised that, where noted, the use of a brand name is for the purpose of describing the standard of quality, performance and characteristics desired, and is in no way intended to limit or restrict competition.

The Contractor shall be advised that he shall be responsible for the coordination of his aspect of the project with all other contractors, and that all drawings and specifications pertaining to the project, whether or not specifically called out in the following scope of work.

Each Contractor (Prime Contractor and Sub-Contractors) will abide by all NYS DOL and OSHA safety standards, and upon notice of award, submit to the owner a company written safety program. Documentation of the implementation of the Company's safety program will be reviewed at weekly job meetings. Each Sub-contractor, before beginning work on the project will submit their own written safety program to the Contractor and to the Owner.

**THE CONTRACT DOCUMENTS**

§ 1.1 The Contract Documents consist of the Owner/Contractor Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in the Owner/Contractor Agreement, and Modifications issued after execution of the Owner/Contractor Agreement, all of which form the Contract, and are as fully a part of the Contract Documents as if attached to the Owner/Contractor 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 a Modification, appears in Article 9 of the Owner/Contractor Agreement.

§ 1.2 Nothing contained in the Contractor’s proposal shall constitute a waiver to any other requirement of this Section.

§ 1.3 In the event of any conflict between this Section and any other requirement of the Contract Documents, the conflict shall be resolved in accordance with the order of precedence outlined as follows, as may be modified by the Supplemental Conditions.

§ 1.3.1 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.

§ 1.3.2 The following rules of interpretation apply to this Contract. If application of any of these rules of interpretation resolves the inconsistency, ambiguity, or discrepancy, it shall not be necessary to apply the Order of Precedence rule:

.1 When one portion of the Contract documents places upon the Contractor more detailed or more stringent requirements than another portion of the Contract documents, the more detailed and more stringent requirement applies. If there is any disagreement as to which requirement is more detailed or more stringent, the requirement that is more costly to perform shall be required unless agreed otherwise between the parties.

.2 In instances where materials and installation techniques or requirements are introduced by a Contractor's submittal that is accepted by the Owner, if there are differences between or among the Contract, the manufacturer's written requirements, the Submittals, and relevant code and standards, the most stringent requirements shall apply. The Contractor shall perform the Work in accordance with the most stringent requirements at no increase in Contract cost or change to Contract schedule.

.3 In the event of a discrepancy between a drawing and figures written thereon, the figures govern over the scaled dimensions unless they are obviously incorrect.

.4 **Anything mentioned in the Specifications and not shown in the Drawings or shown in the Drawings and not mentioned in the Specifications shall be of like effect as if shown in or mentioned in both. Anything addressed in a Drawing or Drawings of one trade discipline and not addressed in a Drawing or Drawings of another trade**

**discipline shall be of like effect as if shown or mentioned in both. All contractors and sub-contractors for all contracts must receive and review the entire bid package, including all drawings and specifications, which in their entirety shall constitute the basis for any bid submitted.**

.5 All Contract Documents and subsequently issued Modifications are essential parts of the Contract and the Contract Documents. A requirement included in one is binding as if included in all. Except as stated below, the following Order of Precedence shall be used to resolve any inconsistencies, conflicts, discrepancies, error, or omissions between or among the documents comprising the Contract, first taking precedence:

1. Most recent modifications, addenda, or change orders to the Owner-Contractor Agreement;
2. Owner-Contractor Agreement;
3. Federal, State and Local laws, regulations, codes or ordinances, as may be applicable;
4. Supplemental Conditions;
5. General Conditions;
6. Specifications;
7. Drawings;
8. Referenced Standards;
9. Project Labor Agreement;
10. Instructions to Bidders;
11. Notice to Bidders;
12. Signed and Completed Bid Proposal.

.6 Reports and documents listed in Contract Documents as "Reference Documents" are not part of the Contract. The Contractor acknowledges that it has read and has knowledge of the Reference Documents' content and the Contractor is deemed to have knowledge of such content. If a document that is not otherwise identified as a "Reference Document" is expressly identified in the Contract as "incorporated by reference" or "attached and incorporated" it is a Contract document rather than a "Reference Document." Documents and standards identified in this Contract as a Contract Document, whether included in the Contract or expressly incorporated by reference, are Contract Documents whether or not a full copy of the document is included as part of the Contract. Such incorporated Contract Documents shall have the priority of the documents they are identified to be.

.7 In the event of any other discrepancy or ambiguity or if design or material requirements are not clearly defined, the Contractor shall promptly submit the issue to the Owner for a written determination. Any action taken by the Contractor before the Owner issues its determination shall be at the Contractor’s own risk and expense.

.8 The Contractor shall not take advantage of any patent or apparent error, omissions, or ambiguity in the contract. With respect to any patent or apparent error, omission, or ambiguity, the Contractor has a duty to inquire prior to submitting its bid. If the Contractor fails to do so, the Owner's interpretation shall prevail.

.9 If the Contractor discovers an error, omission, or that additional information is needed to execute the work, the Contractor shall immediately notify the Owner. The Owner will then make the corrections or interpretations it deems necessary to fulfill the intent of the Contract and shall provide those corrections or interpretations to the Contractor. The Contractor shall provide all labor, materials, tools, and equipment needed to complete the specified work. Where additional details, clarifications, or both are needed to complete the specified work, the Contractor shall comply with the details and clarifications provided by the Owner and the cost of compliance shall be deemed included in the Contract price.

**THE SCOPE OF WORK OF THIS CONTRACT**

§ 2.1 This Scope of Work shall be as outlined in the Contract Documents and is intended to define, but not limit the Scope of Work to be performed. The Scope shall include all necessary labor, material, accessories, equipment, hardware, fasteners, tools, layout, engineering, supervision, hoisting, rigging, scaffolding, shop drawings, detailing, packaging, trucking, freight, delivery,

permits, insurance, bonding, applicable taxes, temporary and permanent utilities, safety, and Site logistics materials. This Scope shall also include staging and all other services required for the complete performance of each Contractor for this Project and in accordance with Contact Documents.

§ 2.2 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.

§ 2.3 Unless otherwise expressly provided in the Contract Documents, the Work shall be performed in accordance with the best modern practice utilizing, unless otherwise specified in writing, new and unused materials of standard first grade quality and workmanship and design of the highest quality, to the satisfaction of the Owner.

§ 2.4 Each Contractor acknowledges that the Scope of Work includes all items that may be inferred as being required by the Drawings and Specifications and is customarily required and supplied in order to furnish a complete product for its intended use.

§ 2.5 The Contractor shall perform all demolition and selective demolition complete and in accordance with the Contract Documents including but not limited to disposal of all furnishings, debris and/or equipment that is not identified otherwise within the Contract Documents if demolition and removal of such items are necessary for the performance of new Work or as directed by the Owner/Construction Manager.

§ 2.6 All items identified or implied in the Drawings, Specifications and Addenda shall be performed timely, diligently, and orderly in accordance with the Contract Documents, the overall Project and/or submitted Schedules, and using practices deemed "standard for the industry" for this geographic region and type of construction.

§ 2.7 Each Contractor understands that the Contract Documents depict design intent and that field conditions may vary. Each Contractor is responsible to apply the design intent per the field conditions with any adjustments to the design being brought to the Architect's attention prior to final installation.

§ 2.8 Where materials or equipment are required by the Specifications or the Contract Drawings to conform to standards, specifications, or requirements or organizations, associations, or societies, the current edition or most recent revision of such standards, specifications, or requirements shall be used. Upon request by the Owner, the Contractor shall furnish the manufacturer’s written certification that the materials or equipment conform to such standards, specifications, or requirements. Such certifications are not binding or conclusive on the Owner and may be rejected at any time if incorrect, improper, or otherwise unsatisfactory. The Owner’s failure to request or reject any certification does not release the Contractor from its full responsibility for the accurate and complete performance of the Work in accordance with the Contract.

§ 2.9 Any approval given by the Owner shall not release the Contractor from its full responsibility for the accurate and complete performance of the Work in accordance with the Contract or from any duty, obligation, or liability imposed upon it by the Contract or from responsibility for injuries to persons or damage to property.

§ 2.10 Any approval given by the Owner pursuant to any provision of the Contract shall be construed merely to mean that at the time the approval is given, the Owner had no reason for objecting. Such approval does not release the Contractor from its full responsibility for the accurate and complete performance of the Work in accordance with the Contract or any duty, obligation, or liability imposed upon it by the Contract or from responsibility for injuries to persons or damage to property.

§ 2.11 Contractor shall render all Work and Extra Work, if any, under their Contract in accordance with applicable provisions of all federal, state, and local laws, rules, and regulations as are in effect at the time such Work and Extra Work, if any, are rendered.

§ 2.12 Unless otherwise expressly provided in the Contract Drawings, Specifications and Addenda, the Means and Methods of Construction shall be such as the Contractor may choose; subject, however, to the Architect or Owner’s right to reject the Means and Methods of Construction proposed by the Contractor which, in the opinion of the Architect or Owner’s:

§ 2.12.1 will constitute or create a hazard to the Work, or to persons or property;

§ 2.12.2 will not produce finished Work in accordance with the terms of the Contract; or

§ 2.12.3 will be detrimental to the overall progress of the Project.

§ 2.13 The Architect or Owner's approval of the Contractor's Means and Methods of Construction, or the Architect or Owner's failure to exercise its right to reject such Means or Methods, shall not relieve the Contractor of its obligation to complete the Work as provided in this Contract; nor shall the exercise of such right to reject create a cause of action for damages.

§ 2.14 Changes in the Work, including Extra Work and Omitted Work shall be governed by the terms and conditions of Article 7 of the General Conditions as may be modified by the Supplemental Conditions.

**All Contracts**: Each contractor is required to obtain and read all other portions of the complete contract documents, even if not listed in there specific trade, so as to ensure that all work related to this contract is accounted for. The contractor shall be required to perform work that may not be explicitly stated, but it is implied, so that work can be completed.

The **Contractor for General Construction** shall furnish all material, labor, equipment, incidentals and appurtenances required to perform the work under the contract for construction of the Town of Montgomery Police Station including, but not limited to, the following:

(1) Division I - General Requirements, including supervision and management, ongoing project-related expenses such as site health and safety, utilities, dust control, bonds and insurances, master mechanic services, contractor's facilities, all office trailers and their related expenses and furnishings, sheds, etc., vehicles and related maintenance including supplies such as fuel, temporary services, preparation and submission of submittals, shop drawings, operations and maintenance manual, etc., protection of existing facilities to remain and protection of completed work, and compliance with the requirements of regulatory agencies and utilities, including executing any and all the requirements of utility companies and regulatory agencies as pertaining to the work.

(2) Mobilization and demobilization of all parts, material and equipment to and from the site, as well as Contractor provided utilities and ongoing expenses, such as site dewatering, considered normal for administration of the work including mobilization and maintenance of an office trailer, as needed, set-up of all required offices, hook-up of all required utilities, site restoration, and final site cleaning.

(3) The General Contractor shall secure and pay all fees for temporary toilets and the weekly maintenance of such throughout the life of the contract. The quantity of temporary toilets shall comply with industry standards, but not to be less than 1 unit per 10 employees per week and separate facilities for male and female employees. He will also be responsible for providing temporary office trailer for the purpose of the job meetings as outlined in the specifications. At his option he may require any or all subcontractors to provide their own trailers for their own use.

(4) The General Contractor shall erect, maintain and remove temporary security fencing around the site perimeter. The fencing will have appropriate warning and identification signage secured to the fence spaced not greater than 6' apart.

(5) Survey services by a licensed New York State Land Surveyor to establish all lines, elevations, and reference marks necessary to complete the work and as required by the Contractor and Engineer during the progress of the work, and from time to time to verify original construction stakeout and resetting control points for interim elevation checks and compaction tests to allow work of the accurate and satisfactory construction and completion of the entire work in accordance with the requirements of the Construction Plans and Technical Specifications to document all underground utilities, inverts, structures, etc. These must be submitted as part of close out documentation.

(6) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary; to provide and maintain erosion and sedimentation control at the site that may be affected as a

result of the construction activities and as required to complete the work in accordance with the Construction Plans and Technical Specifications.

(7) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all demolition, including the proper handling and disposal of hazardous ACM material as presented in the Construction Plans and Technical Specifications, including protection of existing vegetation and facilities outside of the area to be demolished from damage as specified or as directed by the Owner and Engineer.

Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all work as described in the Architectural, Structural and Civil specifications and drawings as outlined in sub-section 1.06 of this section.

(8) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to install a concrete housekeeping pad for the Hot Water Heater.

(9) The Contractor for General Construction will coordinate all prime contractors for each scope of work of the project.

(10) The foregoing is a general description only and shall not be construed as a complete description of the work to be performed. The Contractor is responsible for performing all work required to complete the General Construction work as detailed on the Construction Plans and Technical Specifications.

(11) Temporary facilities and utilities as indicated in Section 01500 and Section 01590.

(12) The Contractor for General Construction will include in his base bid, unit pricing as specified in Section 00 43 22 "Unit Prices Form."

(13) The Contractor for General Construction will include with his base bid, a bid breakdown as specified in Section 00 43 27 "Separate Prices Break-Out Form." This form will be used is for bid comparison and will form the basis for the Contractor Schedule of Values.

(14) The Contractor for General Construction will include with his base bid, pricing for alternates to the base bid as specified in Section 01 23 00 "Alternates."

(15) The Contractor for General Construction will be responsible for developing and maintaining the overall schedule of the project. He will be responsible for the hiring and managing of all sub-contractors

The **Sub-contractor for Plumbing** shall furnish all material, labor, equipment, incidentals and appurtenances required to perform the work under the contract for construction of the Town of Montgomery Police Station including, but not limited to, the following:

(1) Division I - General Requirements, including supervision and management, ongoing project-related expenses such as site health and safety, utilities, dust control, bonds and insurances, master mechanic services, contractor's facilities, all office trailers and their related expenses and furnishings, sheds, etc., vehicles and related maintenance including supplies such as fuel, temporary services, preparation and submission of submittals, shop drawings, operations and maintenance manual, etc., protection of existing facilities to remain and protection of completed work, and compliance with the requirements of regulatory agencies and utilities, including executing any and all the requirements of utility companies and regulatory agencies as pertaining to the work.

(2) Mobilization and demobilization of all parts, material and equipment to and from the site, as well as Contractor provided utilities and ongoing expenses considered normal for administration of the work including mobilization and maintenance of an office trailer, as needed, set-up of all required offices, hook-up of all required utilities, site restoration, and final site cleaning.

(3) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all demolition as presented in the Construction Plans and Technical Specifications, of existing water and sewer service as specified or as directed by the Owner and Engineer.

(4) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to install a concrete housekeeping pad for the Hot Water Heater.

(5) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all work as described in the Plumbing specifications and drawings as outlined in sub-section 1.07 of this section.

(6) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all work as described in the Fire Protection specifications and drawings as outlined in sub-section 1.07 of this section.

(7) The foregoing is a general description only and shall not be construed as a complete description of the work to be performed. The Contractor is responsible for performing all work required to complete the Plumbing work as detailed on the Construction Plans and Technical Specifications.

(9) The Contractor for Plumbing will include with his base bid, a bid breakdown as specified in Section 00 43 27 "separate Prices Break-Out Form." This form will be used is for bid comparison and will form the basis for the Contractor Schedule of Values.

(10) The Contractor for Plumbing will include with his base bid, pricing for alternates to the base bid as specified in Section 01 23 00 "Alternates."

The **Sub-contractor for Heating, Ventilating and Air Conditioning (HVAC)** shall furnish all material, labor, equipment, incidentals and appurtenances required to perform the work under the contract for construction of the Town of Montgomery Police Station including, but not limited to, the following:

(1) Division I - General Requirements, including supervision and management, ongoing project-related expenses such as site health and safety, utilities, dust control, bonds and insurances, master mechanic services, contractor's facilities, all office trailers and their related expenses and furnishings, sheds, etc., vehicles and related maintenance including supplies such as fuel, temporary services, preparation and submission of submittals, shop drawings, operations and maintenance manual, etc., protection of existing facilities to remain and protection of completed work, and compliance with the requirements of regulatory agencies and utilities, including executing any and all the requirements of utility companies and regulatory agencies as pertaining to the work.

(2) Mobilization and demobilization of all parts, material and equipment to and from the site, as well as Contractor provided utilities and ongoing expenses considered normal for administration of the work including mobilization and maintenance of an office trailer, as needed, set-up of all required offices, hook-up of all required utilities, site restoration, and final site cleaning.

(3) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all demolition as presented in the Construction Plans and Technical Specifications, of existing water and sewer service as specified or as directed by the Owner and Engineer.

(4) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all work as described in the Heating, Ventilating and Air Conditioning (HVAC) specifications and drawings as outlined in sub-section 1.08 of this section.

(5) The foregoing is a general description only and shall not be construed as a complete description of the work to be performed. The Contractor is responsible for performing all work required to complete the Plumbing work as detailed on the Construction Plans and Technical Specifications.

(7) The Contractor for Heating, Ventilating and Air Conditioning will include with his base bid, a bid breakdown as specified in Section 00 4327 "separate Prices Break-Out Form." This form will be used is for bid comparison and will form the basis for the Contractor Schedule of Values.

The **Sub-contractor for Electrical** shall furnish all material, labor, equipment, incidentals and appurtenances required to perform the work under the contract for construction of the Town of Montgomery Police Station including, but not limited to, the following:

(1) Division I - General Requirements, including supervision and management, ongoing project-related expenses such as site health and safety, utilities, dust control, bonds and insurances, master mechanic services, contractor's facilities, all office trailers and their related expenses and furnishings, sheds, etc., vehicles and related maintenance including supplies such as fuel, temporary services, preparation and submission of submittals, shop drawings, operations and maintenance manual, etc., protection of existing facilities to remain and protection of completed work, and compliance with the requirements of regulatory

agencies and utilities, including executing any and all the requirements of utility companies and regulatory agencies as pertaining to the work.
(2) Mobilization and demobilization of all parts, material and equipment to and from the site, as well as Contractor provided utilities and ongoing expenses considered normal for administration of the work including mobilization and maintenance of an office trailer, as needed, set-up of all required offices, hook-up of all required utilities, site restoration, and final site cleaning.
(3) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all demolition as presented in the Electrical Plans and Technical Specifications, of electrical service as specified or as directed by the Owner and Engineer.
(4) Provide all labor, materials, equipment, incidentals and appurtenances, as necessary, to complete all work as described in the Electrical specifications and drawings as outlined in sub-section 1.09 of this section.
(5) The foregoing is a general description only and shall not be construed as a complete description of the work to be performed. The Contractor is responsible for performing all work required to complete the Plumbing work as detailed on the Construction Plans and Technical Specifications.
(6) All electrical work shall be coordinated with Orange and Rockland Utilities and Owner.
(8) The Contractor for Electrical will include with his base bid, a bid breakdown as specified in Section 00 43 27 "separate Prices Break-Out Form." This form will be used is for bid comparison and will form the basis for the Contractor Schedule of Values.

**All Contractors:** Provide all Work except Work specifically assigned to other Contractors in this Section. Each contractor is required to obtain and read all other portions of the complete contract documents, even if not listed above, so as to ensure that all work related to this contract is accounted for. The contractor shall be required to perform work that may not be explicitly stated, but it is implied, so that all other contracts can be completed.

**WORK BY OWNER**

Owner will award a contract for supply and installation of Building Access Control & Security system which will commence on installation of door hardware and will require coordination with door hardware supplier and installers and the elecrtical contractor for raceways and power supply. Section 28 10 00 - Access Control is provided in this specification book for reference only.

**OWNER OCCUPANCY**

Owner intends to occupy the Project upon Substantial Completion.

Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

Schedule the Work to accommodate Owner occupancy.

**CONTRACTOR USE OF SITE**

Provide access to and from site as required by law and by Owner:

Emergency Building Exits During Construction: Keep all exits required by code open during the construction period; provide temporary exit signs if exit routes are temporarily altered.

Do not obstruct roadways, sidewalks, or other public ways without permit.

**SPECIFICATION SECTIONS APPLICABLE TO EVERYy CONTRACT**

Unless otherwise noted, provisions of the sections listed below apply to every contract. Specific items of work listed under individual contract descriptions constitute exceptions.

See AIA 101 for a detailed list.

Division 00 - Procurement Requirements

Division 01 - General Requirements

Provide all Work except Work specifically assigned to other contractors in this Section.

The contractor is required to obtain and read all other portions of the complete contract documents, including specifications, so as to ensure that all work related to this contract is accounted for. The contractor shall be required to perform work that may not be explicitly stated, but it is implied, so that contracts can be completed.

**END OF SECTION 01 10 00**

**SECTION 01 20 00**
**PRICE AND PAYMENT PROCEDURES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

### 1.02 FORMAT

A. American Institute of Architects (AIA) documents or other approved forms, including continuation sheets must be attached to Claimant' s Certification, along with the Certified payrolls.

B. For each item, provide a column for listing: Item Number; Description of Work; Scheduled Value, Previous Applications: Work in Place and Stored Materials under this Application: Authorized Change Orders; Total Completed and Stored to Date of Application; Percentage of Completion; Balance to Finish; and Retainage.

### 1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.

D. Revise schedule to list approved Change Orders, with each Application For Payment.

### 1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Present required information on electronic media printout. Execute certification by signature of authorized officer.

B. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

C. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.

D. Prepare Application for Final Payment as specified in Section 01700 - Contract Closeout.

E. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

F. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

G. Execute certification by signature of authorized officer.

H. Submit one electronic and three hard-copies of each Application for Payment.

### 1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 5 days.

D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.

E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.

F. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

G. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

H. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

I. Promptly enter changes in Project Record Documents.

**1.06 APPLICATION FOR FINAL PAYMENT**

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 70 00.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 20 00**

**SECTION 01 22 00**
**UNIT PRICES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

### 1.02 RELATED REQUIREMENTS

A. Document 00 43 22 - Unit Prices Form: List of Unit Prices as supplement to Bid Form

B. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

### 1.03 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

### 1.04 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

### 1.05 SCHEDULE OF UNIT PRICES

A. Item: Bulk Rock Removal; Section 31 23 16.26 - Rock Removal.

B. Item: Trench Rock Removal; Section 31 23 16.26 - Trench Rock Removal.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION - NOT USED

**END OF SECTION 01 22 00**

**SECTION 01 23 00**
**ALTERNATES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Description of Alternates.

B. Procedures for pricing Alternates.

### 1.02 RELATED REQUIREMENTS

A. Document 00 43 23 - Alternates Form: List of Alternates as supplement to Bid Form.

### 1.03 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

### 1.04 SCHEDULE OF ALTERNATES

A. Alternate No. 1 - Supply and install surface mounted mechanically assisted mobile shelving system:
   1. Alternate Item: Section 10 56 26 - Mobile Storage Shelving and 10 51 13 - Metal Lockers (Evidence Lockers) and Drawing number A-201 Room 122 Evidence Room including n/a.

B. Alternate No. 2 - Supply and install special use lockers:
   1. Alternate Item: Section 10 51 13 - Metal Lockers - First Responder Duty Lockers, Evidence Lockers (not part of mobile storage system) and Weapons Lockers and Drawing number A-203 including A-500 drawings.

C. Alternate No. 3 - Deduct cost to supply and install resilient base:
   1. Base Bid Item: Section 09 65 00 - Resilient Flooring and Drawing number A-700; A-701 including Finish Schedule.

D. Alternate No. 4 - Deduct cost to supply and install window shades:
   1. Base Bid Item: Section 12 24 00 - Window Shades and Drawing number A-201; A-202; A-800 including Elevation drawings.

E. Alternate No. 5 - Add cost to change roofing to white EPDM roofing in lieu of black:
   1. Base Bid Item: Section 07 53 23 - Ethylene Propylene Diene Monomer Roofing and Drawing number A-206 including Roof detail drawings.

F. Alternate No. 6 - Add cost to supply and install blast mitigating windows film.:
   1. Alternate Item: Section 08 87 23 - Safety and Security Films and Drawing number A-300; A-301 including Window and Storefront Schedules.

G. Alternate No. 7 - Add cost to modify existing Booking Room bench:
   1. Alternate Item: Section 05 50 00 - Metal Fabrications and Drawing number A-507 including TBD.

H. Alternate No. 8 - Supply and install Emergency Responder Communication Enhancement System (ERCES):
   1. Base Bid Item: Section 28 31 13 - ERCES Pre-testing and Drawing number all including n/a.
      a. NOTE: Pre-testing, as described in Section 28 31 13, shall be by owner.
   2. Alternate Item: Section 28 31 13 - Emergency Responder Communication Enhancement System and Drawing number all including n/a.

**END OF SECTION 01 23 00**

**SECTION 01 25 00**
**SUBSTITUTION PROCEDURES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

### 1.02 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

### 1.03 REFERENCE STANDARDS

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.

B. A Substitution Request for specified installer constitutes a representation that the submitter:
   1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
   1. Note explicitly any non-compliant characteristics.

D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

E. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

### 3.02 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

B. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and

approval by Architect, in order to stay on approved project schedule.

1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
3. Bear the costs engendered by proposed substitution of:
    a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

**3.03 RESOLUTION**

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.
    1. Architect's decision following review of proposed substitution will be noted on the submitted form.

**3.04 ACCEPTANCE**

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

**END OF SECTION 01 25 00**

**SECTION 01 30 00**
**ADMINISTRATIVE REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Electronic document submittal service.

B. Insurance requirements.

C. Preconstruction meeting.

D. Progress meetings.

E. Construction progress schedule.

F. Progress photographs.

G. Coordination drawings.

H. Submittals for review, information, and project closeout.

I. Number of copies of submittals.

J. Submittal procedures.

### 1.02 REFERENCE STANDARDS

A. AIA A201 - General Conditions of the Contract for Construction; 2017.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via the Internet.
   1. The service will be provided and maintained through the Architects office. The on-line documentation service software program is Basecamp.
   2. Besides submittals for review, information, and closeout, this procedure applies to Requests for Information (RFIs), submittals, progress documentation, contract modification documents (e.g., supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   3. Contractor; Consultants and Architect are required to use this service. The Contractor's software will not be used by the Owner or Architect.
   4. It is Contractor's responsibility to submit documents in allowable format.
   5. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
   6. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   7. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   8. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Physical samples as required by contract documents will be delivered to the Architect in accordance with Section 01 60 00 Product Requirements.

C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

## 3.02 INSURANCE REQUIREMENTS

A. Insurance requirements - see AIA document AIA A201-2017 General Conditions of the Contract for Construction.

B. Indemnification
   1. The comprehensive general liability insurance and comprehensive automobile liability insurance policies shall name the Town of Montgomery, Architect and Architect's Consultants as additional insured.
   2. Upon award of the contract and before commencement of the work, the Contractor shall submit a certificate of insurance, copies of additional insured policy endorsements, and other documents as required by the Owner and Architect to certify compliance with the Project Insurance Requirements.
   3. Contractor agrees to defend, indemnify and hold harmless the Town of Montgomery, Architect and Architect's Consultants including its officials, employees and agents, against all claims, losses, damages, liabilities, costs or expenses (including, without limitation, reasonable attorney fees and costs of litigation and/or settlement), whether incurred as a result of a claim by a third party or any other person or entity, arising out of the Services performed and/or goods supplied pursuant to this Agreement which the Town of Montgomery, Architect and Architect's Consultants or its officials, employees or agents, may suffer by reason of any negligence, fault, act or omission of Contractor, its employees, representatives, subcontractors, assignees, or agents.
   4. In the event that any claim is made or any action is brought against the Town of Montgomery arising out of the negligence, fault, act, or omission of an employee, representative, subcontractor, assignee, or agent of Contractor either within or without the scope of his respective employment representation, subcontract, assignment or agency, or arising out of Contractor's negligence, fault, act or omission, then the Town of Montgomery shall have the right to withhold further payments hereunder, for the purpose of se-off, in sufficient sums to cover the said claim or action. The rights and remedies of the Town of Montgomery, Architect and Architect's Consultants provided for in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or this Agreement.

## 3.03 NYS CALL BEFORE YOU DIG - CODE RULE 753 COMPLIANCE

A. Contractor shall be familiar with and in full compliance with NYS Code Rule 753, which states, in part:
   1. "**SUBPART 753-3 DUTIES OF EXCAVATORS**
      a. 753-3.1 Timing of notice for excavation or demolition.
         1) Before commencing or engaging in any non-emergency excavation or demolition, each excavator shall provide notice of the location and date of the planned excavation or demolition to the one-call notification system serving the vicinity in which the excavation or demolition is to take place.
         2) Such notice shall be served at least two but not more than ten working days, not including the date of the call, before the commencement date of the excavation or demolition."

## 3.04 PRECONSTRUCTION MEETING

A. Owner and Architect will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Prime Contractors.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.

4. Designation of personnel representing the parties to Contract and Architect.
5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
6. Scheduling.
7. Security and housekeeping procedures.
8. Procedures for testing.
9. Application for payment procedures.

**3.05 PROGRESS MEETINGS**

A. Schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.

B. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Special consultants.
5. Prime Contractor's Superintendent's.
6. Major subcontractors.

C. Agenda:
1. Review minutes of previous meetings.
2. Review of work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to work.

**3.06 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 32 16**

A. If preliminary schedule requires revision after review, submit revised schedule within 2 days.

B. Within 7 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 5 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

**3.07 PROGRESS PHOTOGRAPHS**

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. In addition to periodic, recurring views, take photographs of each of the following events:
1. Completion of demolition and site clearing.
2. Excavations in progress.
3. Foundations in progress and upon completion.
4. Structural framing in progress and upon completion.
5. Enclosure of building, upon completion.

6. Final completion, minimum of 30 photos.

### 3.08 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to Architect.

### 3.09 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule specified in Section - 01 32 16 - Construction Progress Schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.
   4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

### 3.10 BASIC SUBMITTAL PROCEDURES

A. Submit electronically per Architects designated service as outlined in paragraph 3.01 of this section. Submit one (1) original each Application for Payment.

B. Submit an updated construction schedule specified in Section 01041-Project Coordination, and updated Network Schedule as specified in Section 01311 - Network Analysis Schedules.

C. Submit Record Drawings showing limits, elevations and grades for Work completed as of date of payment request with each Application for Payment. See Section 01 10 00 Summary; paragraph 1.02.I.5.

D. Payment Period - Submit at intervals stipulated in the Owner-Contractor Agreement. Submit under transmittal letter.
   1. Progress payments will not be processed until project Record Documents are up-to-date and complete.

E. Application for Payment will not be processed unless it is complete and contains all of the above specified items for the work covered by the payment request.

### 3.11 SUBSTANTIATING DATA

A. When Owner requires substantiating information, submit data justifying dollar amounts in question.
   1. Provide one (1) copy of data with cover letter for each copy of submittal. Show Application number and date, and line item by number and description.

### 3.12 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.
   1. Physical samples of all finishes must be submitted.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

### 3.13 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

### 3.14 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

### 3.15 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

### 3.16 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
   6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Upload submittals in electronic form to Electronic Document Submittal Service website.
   7. Schedule submittals to expedite the Project, and coordinate submission of related items.

a. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.

8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
9. Provide space for Contractor and Architect review stamps.
10. When revised for resubmission, identify all changes made since previous submission.
11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

**3.17 SUBMITTAL REVIEW**

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "No Exception Taken", or language with same legal meaning.
b. "Note Markings, Resubmission not Required", or language with same legal meaning.
1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
c. "Note Markings, Resubmit for Record", or language with same legal meaning.
2. Not Authorizing fabrication, delivery, and installation:
a. "Revise and Resubmit".
1) Resubmit revised item, with review notations acknowledged and incorporated.
b. "Rejected".
1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:
a. "Reviewed" - no further action is required from Contractor.

**END OF SECTION 01 30 00**

**SECTION 01 32 16**
**CONSTRUCTION PROGRESS SCHEDULE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

### 1.02 REFERENCE STANDARDS

### 1.03 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

1. The contractor will identify all long lead items and incorporate such items into the Critical Path. Long lead items that must be identified include, but are not necessarily limited to, the Electrical Switch Gear, Generator, Transfer Switch, HVAC Equipment for possible expedited purchase.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

E. Submit in PDF format.

### 1.04 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

### 1.05 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 24 x 36 inches (600 x 900 mm).

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

### 3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules to define critical portions of the entire schedule.

E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

F. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.

G. Indicate delivery dates for owner-furnished products.

H. Provide legend for symbols and abbreviations used.

### 3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

### 3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

### 3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

### 3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

**END OF SECTION 01 32 16**

**SECTION 01 40 00**
**QUALITY REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Inspection agencies and services.

E. Contractor's construction-related professional design services.

F. Contractor's design-related professional design services.

G. Control of installation.

H. Tolerances.

I. Defect Assessment.

### 1.02 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2024.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2023.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2023.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2021.

G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.

### 1.03 DEFINITIONS

A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

B. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.
   1. Design Services Types Required:
      a. Construction-Related: Services Contractor needs to provide in order to carry out the Contractor’s sole responsibilities for construction means, methods, techniques, sequences, and procedures.
      b. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.

C. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

### 1.04 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
   1. Temporary sheeting, shoring, or supports.
   2. Temporary scaffolding.
   3. Temporary bracing.
   4. Temporary falsework for support of spanning or arched structures.
   5. Temporary stairs or steps required for construction access only.
   6. Temporary hoist(s) and rigging.
   7. Investigation of soil conditions to support construction equipment.

## 1.05 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Base design on performance and/or design criteria indicated in individual specification sections.
   1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.

C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
   1. Structural Design of Steel Connections: As described in Section 05 12 00 - Structural Steel Framing.
   2. Structural Design of Steel Decking: As described in Section 05 31 00 - Steel Decking.
   3. Structural Design of Metal Framing: As described in Section 05 40 00 - Cold-Formed Metal Framing.
   4. Design of Cladding Support Systems: As described in Section 07 05 43 - Cladding Support Systems.
   5. Structural Design Calculations for Exterior Assemblies: As described in Section 08 41 26 - All-Glass Entrances and Storefronts.
   6. Structural Design: Include calculations for resisting wind loads, anchor locations, loads at points of attachment to building structure, physical characteristics, resulting dimensional limitations as described in Section 08 44 13 - Glazed Aluminum Curtain Walls.
      a. Structural Design: Include calculations for resisting wind loads, anchor locations, loads at points of attachment to building structure, physical characteristics, resulting dimensional limitations for Brise Soliel System as described in Section 08 44 13 - Glazed Aluminum Curtain Walls.
   7. Structural Design for Seismic Loads: As described in Section 10 56 26 - Mobile Storage Shelving.
   8. Structural Design of Canopy: As described in Section 10 73 16.13 - Metal Canopies.

## 1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for Owner's information.
   1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
      a. Full name.
      b. Professional licensure information.
      c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.

C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
   1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
   2. Include required product data and shop drawings.

3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.

D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
1. Include:
a. Date issued.
b. Project title and number.
c. Name of inspector.
d. Date and time of sampling or inspection.
e. Identification of product and specifications section.
f. Location in the Project.
g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Compliance with Contract Documents.
k. When requested by Architect, provide interpretation of results.

E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

**1.07 QUALITY ASSURANCE**

A. Testing Agency Qualifications:
1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

C. Contractor's Quality Control (CQC) Plan:
1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
1) Management and control of documents and records relating to quality.

2) Communications.
3) Coordination procedures.
4) Inspection and testing procedures and scheduling.
5) Control of noncomplying work.
6) Project materials certification.

c. Acceptance of the plan is required prior to start of construction activities not including mobilization work. Owner's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. Owner reserves the right to require Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.

**1.08 REFERENCES AND STANDARDS**

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

**1.09 TESTING AND INSPECTION AGENCIES AND SERVICES**

A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, and ASTM D3740.
2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
3. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

**PART 3 EXECUTION**

**2.01 CONTROL OF INSTALLATION**

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

**2.02 TOLERANCES**

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

**2.03 TESTING AND INSPECTION**

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

## 2.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

**END OF SECTION 01 40 00**

**SECTION 01 45 33**
**CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES**

## PART 1 GENERAL

### 3.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

### 3.02 ABBREVIATIONS AND ACRONYMS

A. AHJ: Authority having jurisdiction.

B. NIST: National Institute of Standards and Technology.

### 3.03 DEFINITIONS

A. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

B. Special Inspection:
   1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
   2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

### 3.04 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2023).

C. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2024.

D. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2017.

E. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.

F. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2023.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

I. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).

J. ICC (IBC)-2018 - International Building Code; 2018.

K. SDI (QA/QC) - Standard for Quality Control and Quality Assurance for Installation of Steel Deck; 2017.

### 3.05 SUBMITTALS

A. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:

1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Submit certification that Special Inspection Agency is acceptable to AHJ.

B. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.
1. Include:
a. Date issued.
b. Project title and number.
c. Name of Special Inspector.
d. Date and time of special inspection.
e. Identification of product and specifications section.
f. Location in the Project.
g. Type of special inspection.
h. Date of special inspection.
i. Results of special inspection.
j. Compliance with Contract Documents.

C. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
1. Include:
a. Date issued.
b. Project title and number.
c. Name of inspector.
d. Date and time of sampling or inspection.
e. Identification of product and specifications section.
f. Location in the Project.
g. Type of test or inspection.
h. Date of test or inspection.
i. Results of test or inspection.
j. Compliance with Contract Documents.

D. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

## 3.06 SPECIAL INSPECTION AGENCY

A. Owner or Architect will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

## 3.07 TESTING AND INSPECTION AGENCIES

A. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

## 3.08 QUALITY ASSURANCE

A. Special Inspection Agency Qualifications:
1. Independent firm specializing in performing testing and inspections of the type specified in this section.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 5.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
   1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
   2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

### 5.02 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

A. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC)-2018.

B. Cold-Formed Steel Deck: Comply with quality assurance inspection requirements of SDI (QA/QC).

C. Open-Web Joists and Joist Girders: Comply with requirements of ICC (IBC), Table 1705.2.3.
   1. End Connections - Welding or Bolted: Comply with requirements of SJI 100; periodic.
   2. Bridging - Horizontal or Diagonal:
      a. Standard Bridging: Comply with requirements of SJI 100; periodic.
      b. Bridging That Differs From the SJI Specifications: Periodic inspection.

D. High-Strength Bolt, Nut and Washer Material:
   1. Verify identification markings comply with ASTM standards specified in the approved contract and to AISC 360, Section A3.3; periodic.
   2. Submit manufacturer's certificates of compliance; periodic.

E. High-Strength Bolting Installation: Verify items listed below comply with AISC 360, Section M2.5.
   1. Snug tight joints; periodic.

F. Structural Steel and Cold Formed Steel Deck Material:
   1. Structural Steel: Verify identification markings comply with AISC 360, Section M3.5; periodic.
   2. Other Steel: Verify identification markings comply with ASTM standards specified in the approved Contract Documents; periodic.
   3. Submit manufacturer's certificates of compliance and test reports; periodic.

G. Weld Filler Material:
   1. Verify identification markings comply with AWS standards specified in the approved Contract Documents and to AISC 360, Section A3.5; periodic.
   2. Submit manufacturer's certificates of compliance; periodic.

H. Welding:
   1. Structural Steel and Cold Formed Steel Deck:
      a. Complete and Partial Joint Penetration Groove Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      b. Multipass Fillet Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      c. Single Pass Fillet Welds Less than 5/16 inch (7.94 mm) Wide: Verify compliance with AWS D1.1/D1.1M; periodic.
      d. Plug and Slot Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      e. Single Pass Fillet Welds 5/16 inch (7.94 mm) or Greater: Verify compliance with AWS D1.1/D1.1M; continuous.
      f. Floor and Roof Deck Welds: Verify compliance with AWS D1.3/D1.3M; continuous.
   2. Reinforcing Steel: Verify items listed below comply with AWS D1.4/D1.4M and ACI CODE-318, Section 3.5.2.
      a. Verification of weldability; periodic.

b. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames as well as where it is referenced in older codes. Elements of special structural walls of concrete and shear reinforcement; continuous.
c. Shear reinforcement; continuous.
d. Other reinforcing steel; periodic.

I. Steel Frame Joint Details: Verify compliance with approved Contract Documents.
1. Details, bracing and stiffening; periodic.
2. Member locations; periodic.
3. Application of joint details at each connection; periodic.

**5.03 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION**

A. Reinforcement, Including Prestressing Tendons, and Verification of Placement: Verify compliance with ACI CODE-318, Chapters 20, 25.2, 25.3, 26.6.1-26.6.3; periodic.

B. Anchors Cast in Concrete: Verify compliance with ACI CODE-318; periodic.

C. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify compliance with approved Contract Documents and ACI CODE-318, Sections 8.1.3 and 21.2.8 prior to and during placement of concrete; continuous.

D. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI CODE-318.
1. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.

E. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M, and ACI CODE-318, Chapter 26.5, 26.12, and record the following, continuous:
1. Slump.
2. Air content.
3. Temperature of concrete.

**5.04 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION**

A. Masonry Structures Subject to Special Inspection:
1. Empirically designed masonry, glass unit masonry and masonry veneer in structures designated as "essential facilities".
2. Engineered masonry in structures classified as "low hazard..." and "substantial hazard to human life in the event of failure".

B. Verify each item below complies with approved Contract Documents and the applicable articles of TMS 402/602.
1. Inspections and Approvals:
a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
b. Verify approval of submittals required by Contract Documents; periodic.
2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction unless specifically exempted by code; periodic.
3. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
4. Joints and Accessories: When masonry construction begins, verify:
a. Proportions of site prepared mortar; periodic.
b. Construction of mortar joints; periodic.
c. Location of reinforcement, connectors, prestressing tendons, anchorages, etc; periodic.
5. Structural Elements, Joints, Anchors, Protection: During masonry construction, verify:
a. Size and location of structural elements; periodic.
b. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; periodic.

c. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
d. Welding of reinforcing bars; continuous.

6. Grouting Preparation: Prior to grouting, verify:
   a. Grout space is clean; periodic.
   b. Correct placement of reinforcing, connectors, prestressing tendons and anchorages; periodic.
   c. Correctly proportioned site prepared grouts and prestressing grout for bonded tendons; periodic.
   d. Correctly constructed mortar joints; periodic.
7. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; periodic.

C. Engineered Masonry in Buildings Designated as "Essential Facilities": Verify compliance of each item below with approved Contract Documents and the applicable articles of TMS 402/602.
1. Inspections and Approvals:
   a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
   b. Verify approval of submittals required by Contract Documents; periodic.
2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction and upon completion of each 5,000 square feet (464.5 sq m) increment of masonry erected during construction; periodic.
3. Preblended Mortar and Grout: Verify proportions of materials upon delivery to site; periodic.
4. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
5. Engineered Elements, Joints, Anchors, Grouting, Protection: Verify compliance of each item below with approved Contract Documents and referenced standards.
   a. Proportions of site prepared mortar; periodic.
   b. Placement of masonry units and construction of mortar joints; periodic.
   c. Placement of reinforcement, connectors, prestressing tendons, anchorages, etc.; periodic.
   d. Size and location of structural elements; periodic.
   e. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; continuous.
   f. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
   g. Welding of reinforcing bars; continuous.
6. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; continuous.

**5.05 SPECIAL INSPECTIONS FOR SOILS**

A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
1. Design bearing capacity of material below shallow foundations; periodic.
2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.

B. Testing: Classify and test excavated material; periodic.

**5.06 STRUCTURAL OBSERVATIONS FOR STRUCTURES**

A. Provide Observations: For structure where one or more of the following conditions exist:
1. The structure is classified as Risk Category IV.

## 5.07 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified reference standards.
   3. Ascertain compliance of materials and products with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests or inspections specified.

B. Limits on Special Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the work.

C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

## 5.08 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests or inspections specified.

B. Limits on Testing or Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

## 5.09 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Contractor Responsibilities, General:
   1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
   2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to work to be tested or inspected.

b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
c. To facilitate tests or inspections.
d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

## 5.10 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, to test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

**END OF SECTION 01 45 33**

**SECTION 01 50 00**
**TEMPORARY FACILITIES AND CONTROLS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Waste removal facilities and services.

F. Project identification sign.

G. Field offices.

### 1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

### 1.03 TEMPORARY UTILITIES

A. The Contractor for General Construction shall provide and pay for all electrical power, water, heating and cooling, and ventilation required for construction purposes.

B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

### 1.04 TEMPORARY SANITARY FACILITIES

A. The Contractor for General Construction shall provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition and as further required in Section 01 10 00.

### 1.05 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to allow public access to the Public Park and to protect existing facilities and adjacent properties from damage from construction operations .

### 1.06 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

### 1.07 PROHIBITED CONSTRUCTION PROCEDURES

A. Prohibited construction procedures for all parts of the work include, but are not limited to, the following:
   1. Dumping of spoil material into any stream corridor, any wetlands, any surface waters, or at unspecified locations.
   2. Indiscriminate, arbitrary or capricious operation of equipment in any stream corridors, any wetlands, or any surface waters.
   3. Pumping of silt-laden water from trenches or other excavations into any surface waters, any stream corridors, or any wetlands.
   4. Damaging vegetation adjacent to or outside of the access road or right- of-way.
   5. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.
   6. Permanent or unspecified alteration of the flow line of the stream.

7. Open burning of debris.
8. Applying any pesticides, including defoliants, desiccants, and plant regulators, in any wetlands.
9. Applying pesticides whose residues and metabolic products persist in the environment over extended periods of time.
10. Locating storage, stockpile, staging and de-watering controls in environmentally sensitive areas.
11. Disposal of excess excavation material in wetlands, stream corridors and flood plains.
12. Permission or other arrangements with a land owner or others shall not relieve the Contractor of compliance with the requirements of this section.
13. Any violation of the requirements of this section by the Contractor or any person employed by him will be brought to the immediate attention of the responsible regulatory agencies with a request that appropriate action be taken against the offending parties. Further, the Contractor will be required to remedy any violation at his own expense.

**1.08 SECURITY**

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

**1.09 VEHICULAR ACCESS AND PARKING**

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

**1.10 WASTE REMOVAL**

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site periodically.

D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

**1.11 PROJECT IDENTIFICATION**

A. Provide project identification sign of design, construction, and location approved by Owner and Architect.

B. No other signs are allowed without Owner and Architect permission except those required by law.

**1.12 FIELD OFFICES**

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 12 persons.

C. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

**1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

E. Restore new permanent facilities used during construction to specified condition.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 50 00**

**SECTION 01 57 13**
**TEMPORARY EROSION AND SEDIMENT CONTROL**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

### 1.02 RELATED REQUIREMENTS

A. Section 31 37 00 - Riprap: Temporary and permanent stabilization using riprap.

B. Section 32 11 23 - Aggregate Base Courses: Temporary and permanent roadways.

### 1.03 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.

B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.

C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).

D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).

E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.

F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).

### 1.04 PERFORMANCE REQUIREMENTS

A. Also comply with all more stringent requirements of State of New York Erosion and Sedimentation Control Manual.

B. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

C. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

D. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

E. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

F. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.

3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

G. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

H. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

I. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

J. Open Water: Prevent standing water that could become stagnant.

K. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

**1.05 SUBMITTALS**

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Erosion and Sedimentation Control Plan:
   1. Submit within 2 weeks after Notice to Proceed.
   2. Include:
      a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
      b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
      c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
      d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
      e. Other information required by law.
      f. Format required by law is acceptable, provided any additional information specified is also included.
   3. Obtain the approval of the Plan by authorities having jurisdiction.
   4. Obtain the approval of the Plan by Owner.

C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.
   4. Cutback asphalt.
   5. Polyethylene film, where specifically indicated only.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches (350 by 450 mm), minimum.
   2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet (1 m) long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot (1.98 kg per linear m).
   2. Wood, 2 by 2 inches (50 by 50 mm) in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve (0.600 mm), maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491/D4491M.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 pounds-force (450 N), minimum, in cross-machine direction; 124 pounds-force (550 N), minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 pounds-force (245 N), minimum, when tested in accordance with ASTM D4533/D4533M.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

F. Silt Fence Posts: One of the following, minimum 5 feet (1500 mm) long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot (1.98 kg per linear m).
   2. Hardwood, 2 by 2 inches (50 by 50 mm) in cross section.

G. Gravel: See Section 32 11 23 for aggregate.

H. Riprap: See Section 31 37 00.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

### 3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

### 3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet (7 m), minimum.
   2. Length: 50 feet (16 m), minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
   2. Space sediment barriers with the following maximum slope length upslope from barrier:
      a. Slope of Less Than 2 Percent: 100 feet (30 m)..
      b. Slope Between 2 and 5 Percent: 75 feet (23 m).
      c. Slope Between 5 and 10 Percent: 50 feet (15 m).
      d. Slope Between 10 and 20 Percent: 25 feet (7.5 m).
      e. Slope Over 20 Percent: 15 feet (4.5 m).

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
   1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
   2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.
   2. Cover with mulch at least 4 inches (100 mm) thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches (150 mm) of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
   1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
   2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

I. Temporary Seeding: Use where temporary vegetated cover is required.

### 3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches (150 mm).
   2. Place geotextile fabric full width and length, with minimum 12 inch (300 mm) overlap at joints.
   3. Place and compact at least 6 inches (150 mm) of 1 1/2 to 3 1/2 inch (40 to 90 mm) diameter stone.

B. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873/D4873M.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch (405 mm) high barriers with minimum 36 inch (905 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 4 inches (100 mm) in ground.

3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch (710 mm) high barriers, minimum 48 inch (1220 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet (6 m), use nominal 32 inch (810 mm) high barriers with woven wire reinforcement and steel posts spaced at 4 feet (1220 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
5. Install with top of fabric at nominal height and embedment as specified.
6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches (460 mm), with extra post.
7. Fasten fabric to wood posts using one of the following:
    a. Four nails per post with 3/4 inch (19 mm) diameter flat or button head, 1 inch (25 mm) long, and 14 gauge, 0.083 inch (2.11 mm) shank diameter.
    b. Five staples per post with at least 17 gauge, 0.0453 inch (1.150 mm) wire, 3/4 inch (19 mm) crown width and 1/2 inch (12 mm) long legs.
8. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
9. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches (300 mm) high with post spacing not more than 4 feet (1220 mm).

C. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
2. Install bales so that bindings are not in contact with the ground.
3. Embed bales at least 4 inches (100 mm) in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches (450 mm) into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.
6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Mulching Over Large Areas:
1. Dry Straw and Hay: Apply 2-1/2 tons per acre (6350 kg per hectare); anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
2. Wood Waste: Apply 6 to 9 tons per acre (15,200 to 20,800 kg per hectare).
3. Asphalt: Apply at 1200 gallons per acre (11,000 L per hectare).
4. Erosion Control Matting: Comply with manufacturer's instructions.

E. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches (100 to 150 mm) depth.
2. Wood Waste: Apply 2 to 3inches (50 to 75 mm) depth.
3. Asphalt: Apply 1/4 gallon per square yard (1 L per 100 sq m).
4. Erosion Control Matting: Comply with manufacturer's instructions.

F. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft (0.5 kg per 100 sq m).
4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft (6 to 8 kg per 100 sq m).
5. Incorporate fertilizer into soil before seeding.

6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch (12 to 25 mm) deep.
7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
8. Repeat irrigation as required until grass is established.

**3.05 MAINTENANCE**

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches (13 mm) or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
2. Remove silt deposits that exceed one-half of the height of the bales.
3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

**3.06 CLEAN UP**

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

**END OF SECTION 01 57 13**

**SECTION 01 57 19**
**TEMPORARY ENVIRONMENTAL CONTROLS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Construction procedures to promote adequate indoor air quality after construction.

B. Building flush-out after construction and before occupancy.

C. Testing indoor air quality before commencement of construction; existing building areas only.

D. Testing indoor air quality after completion of construction.

E. Testing residential unit air isolation.

### 1.02 PROJECT GOALS

A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
   1. Cleaning of ductwork is not contemplated under this Contract.
   2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
   3. Establish condition of existing ducts and equipment prior to start of alterations.

B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
   1. Furnish products meeting the specifications.
   2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

### 1.03 NOISE CONTROL

A. The Contractor shall control the noise generated by his construction operations.

B. Noise caused by construction activities shall not exceed the levels permitted by applicable Federal, State or local regulations.

C. All construction equipment powered by an internal combustion engine shall be equipped with a properly maintained muffler.

D. Air compressors shall be operated in accordance with the manufacturer's instructions for proper noise abatement.

E. Air powered equipment shall be fitted with pneumatic exhaust silencers.

F. Stationary equipment powered by an internal combustion engine shall not be operated within 150 feet of noise sensitive sites without temporary noise barriers placed between the equipment and the noise sensitive sites. Noise sensitive sites shall include residential buildings, motels, hotels, schools, churches, hospitals, nursing homes, libraries and public recreation areas. Temporary noise barriers shall be constructed of plywood or tongue and groove boards with a noise absorbent treatment on the interior surface (facing the equipment).

G. Unless otherwise permitted by the owner in times of an emergency, powered construction equipment shall not be operated before 7:00 am or after 6:00 pm.

H. Unless otherwise permitted by the owner in times of an emergency, driving, pulling or other operations entailing the use of vibratory hammers or use of vibratory compactor shall not be permitted before 8:00 am or after 5:00 pm within 100 feet of a noise sensitive site.

### 1.04 DUST CONTROL

A. The Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation and dispersion of dust.

B. The Contractor shall sprinkle with water and calcium chloride to control dust in unpaved streets, trench areas or excavation sites on a daily basis.

C. Areas under immediate construction (including access roads and other affected areas) will be swept clean and wet down sufficiently to lay dust at the end of each day. In addition, these areas will be wet down during non-working hours (including weekends) as often as required to keep the dust under control.

D. If, in the opinion of the Engineer, the Contractor is not maintaining adequate dust control, the Engineer will notify the Contractor who shall promptly provide whatever methods and means are necessary to bring the dust under control.

E. In the event of restricted water use in the municipality at the time of bid, the Contractor shall obtain, pay for and transport water from his own sources as required.

**1.05 REFERENCE STANDARDS**

A. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology); 2021.

B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2; 2017.

C. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in Indoor Air; 1990.

D. EPA 625/R-96/010b - Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air; 1999, with Addendum (2000).

E. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction; 2007.

**1.06 DEFINITIONS**

A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.

B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.

C. Particulates: Dust, dirt, and other airborne solid matter.

D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

**3.01 CONSTRUCTION PROCEDURES**

A. Prevent the absorption of moisture and humidity by adsorptive materials by:
   1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
   2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
   3. Provide sufficient ventilation for drying within reasonable time frame.

B. Begin construction ventilation when building is substantially enclosed.

C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.

D. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.

E. Do not store construction materials or waste in mechanical or electrical rooms.

F. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
   1. Inspect duct intakes, return air grilles, and terminal units for dust.
   2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
   3. Clean tops of doors and frames.

4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
5. Clean return plenums of air handling units.
6. Remove intake filters last, after cleaning is complete.

G. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.

H. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

**3.02 BUILDING FLUSH-OUT**

A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.

B. Perform building flush-out before occupancy.

C. Do not start flush-out until:
1. All construction is complete.
2. HVAC systems have been tested, adjusted, and balanced for proper operation.
3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
4. New HVAC filtration media have been installed.

D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot (4500 cubic meters per square meter) of floor area has been supplied.
1. Obtain Owner's concurrence that construction is complete enough before beginning flush-out.
2. Maintain interior temperature of at least 60 degrees F (15 degrees C) and interior relative humidity no higher than 60 percent.
3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
4. If interior spaces must be occupied prior to completion of the flush-out, supply a minimum of 25 percent of the total air volume prior to occupancy, and:
    a. Begin ventilation at least three hours prior to daily occupancy.
    b. Continue ventilation during all occupied periods.
    c. Provide minimum outside air volume of 0.30 cfm per square foot (0.0015 cu m/s/sq m) or design minimum outside air rate, whichever is greater.

E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

**3.03 AIR CONTAMINANT TESTING**

A. Contractor's Option: Either full continuous flush-out, or satisfactory air contaminant testing is required, not both.

B. Perform air contaminant testing before starting construction, as base line for evaluation of post-construction testing.

C. Perform air contaminant testing before occupancy.

D. Do not start air contaminant testing until:
1. All construction is complete, including interior finishes.
2. HVAC systems have been tested, adjusted, and balanced for proper operation.
3. New HVAC filtration media have been installed.

E. Indoor Air Samples: Collect from spaces representative of occupied areas:
1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.

2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet (2300 square meters); take samples from areas having the least ventilation and those having the greatest presumed source strength.
3. Collect samples from height from 36 inches (915 mm) to 72 inches (1830 mm) above floor.
4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
6. When retesting the same building areas, take samples from at least the same locations as in first test.

F. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.

G. Analyze air samples and submit report.

H. Air Contaminant Concentration Limits:
1. Formaldehyde: Not more than 27 parts per billion.
2. PM10 Particulates: Not more than 50 micrograms per cubic meter.
3. Total Volatile Organic Compounds (TVOCs): Not more than 500 micrograms per cubic meter.
4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: Allowable concentrations listed in Table 4-1.
5. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.

I. Air Contaminant Concentration Test Methods:
1. Formaldehyde: ASTM D5197, EPA 625/R-96/010b Method TO-11A, or EPA 600/4-90/010 Method IP-6.
2. Particulates: EPA 600/4-90/010 Method IP-10.
3. Total Volatile Organic Compounds (TVOC): EPA 625/R-96/010b Method TO-1, TO-15, or TO-17; or EPA 600/4-90/010 Method IP-1.
4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: ASTM D5197, or EPA 625/R-96/010b Method TO-1, TO-15, or TO-17.
5. Carbon Monoxide: EPA 600/4-90/010 Method IP-3, plus measure outdoor air; measure in ppm; report both indoor and outdoor measurements.

**END OF SECTION 01 57 19**

**SECTION 01 60 00**
**PRODUCT REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Transportation, handling, storage and protection.

B. Product option requirements.

C. Substitution limitations.

D. Procedures for Owner-supplied products.

E. Maintenance materials, including extra materials, spare parts, tools, and software.

### 1.02 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

## PART 2 PRODUCTS

### 2.01 SYSTEM DESCRIPTION

A. Products shall be delivered, stored and handled in a manner that will assure preservation of quality and fitness for incorporation in the work.

B. As and if required products shall be protected from the elements during storage by providing sheltered, weather-tight enclosures. Skids or platforms shall be provided for products subject to damage by contact with ground.

C. Packaged materials shall be stored in their original packages or containers with weather resistant tags identifying the package contents, manufacturer's name and Contractor's name.

D. Copies of all delivery tickets, vendor tickets, bills of lading and other records shall be given to the Engineer or construction observer at the time of delivery and shall contain the name of supplier, material delivered, quantity of material, date of delivery and project name.

E. If partial payments have been made for products or equipment suitably stored off-site, the Contractor shall provide certificates of insurance for full replacement value of the products or equipment.

F. Unless otherwise specified, the Contractor shall provide insurance to hold harmless the Owner and Engineer against liability claims and judgments or demands for damages arising from accidents to persons or property occasioned by transportation, handling and storage or products or equipment. A certificate shall be provided prior to shipping.

G. The Contractor shall comply with manufacturer's recommendations concerning periodic maintenance requirements for items stored for extended periods.

H. Equipment or materials shall not be stored on the site in such a manner as to interfere with the Owner's operation, create obstructions that would endanger the public, or interfere with the work. Equipment and material shall not be stored within 100 feet of any intersection, or on any sidewalks.

I. Pipe, manholes, appurtenances, backfill material, stone, select materials, and all other construction materials shall not be stored or stockpiled on public thoroughfares or adjoining

rights-of-way more than one day in advance of their intended incorporation into the work. In no case shall any material be stored or stockpiled outside of the rights-of-way or easements or on private property without the written permission of the property owner. A copy of said written permission shall be supplied to the Owner

**2.02 NEW PRODUCTS**

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
   1. Made using or containing CFC's or HCFC's.
   2. Made of wood from newly cut old growth timber.
   3. Containing lead, cadmium, or asbestos.

**2.03 PRODUCT OPTIONS**

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

**2.04 MAINTENANCE MATERIALS**

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

**PART 3 EXECUTION**

**3.01 SUBSTITUTION LIMITATIONS**

A. See Section 01 25 00 - Substitution Procedures.

**3.02 TRANSPORTATION AND HANDLING**

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

**3.03 STORAGE AND PROTECTION**

A. Provide protection of stored materials and products against theft, casualty, or deterioration.

B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Prevent contact with material that may cause corrosion, discoloration, or staining.

K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION 01 60 00**

**SECTION 01 70 00**
**EXECUTION AND CLOSEOUT REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition.

C. Pre-installation meetings.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Cleaning and protection.

G. Starting of systems and equipment.

H. Demonstration and instruction of Owner personnel.

I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

J. General requirements for maintenance service.

### 1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.

B. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

C. Section 01 91 13 - General Commissioning Requirements: Contractor's responsibilities in regard to commissioning.

D. Section 07 84 00 - Firestopping.

### 1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. The Contractor shall submit a written request before cutting or executing alteration work which affects the following:
      a. Owner's operation;
      b. Structural value or integrity of any element of the project;
      c. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems;
      d. Efficiency, operational life, maintenance or safety of operational elements; or,

e. Visual qualities of sight-exposed elements.

7. The submittal request shall include but not be limited to the following:
   a. Description of affected work;
   b. The necessity for cutting, alteration or excavation;
   c. Effect on owner's operation or on structural or weatherproof integrity of project; and,
8. Description of proposed work:
   a. Scope of cutting, patching, alteration, or excavation.
   b. Products proposed to be used.
   c. Extent of refinishing to be done.
9. Include in request:
   a. Identification of Project.
   b. Location and description of affected work.
   c. Necessity for cutting or alteration.
   d. Description of proposed work and products to be used.
   e. Effect on work of Owner or separate Contractor.
   f. Written permission of affected separate Contractor.
   g. Date and time work will be executed.

**1.05 QUALIFICATIONS**

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

**1.06 PROJECT CONDITIONS**

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
2. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.

G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

## 1.07 UTILITIES - NOTIFICATION AND MARKOUT

A. System Description
1. Contractor shall be responsible for protection of underground facilities in accordance with 16 NYCRR Part 753.
2. Prior to construction, contractor shall call the UFPO, and notify in writing owners of utilities and structures within the vicinity of the proposed work. Copies of written notification to utility owners shall be submitted to the engineer.
3. Contractor shall provide the engineer with a list of all owners of utilities and structures contacted, including the time and date of contact and the names of responsible individuals contacted.
4. Contractor shall be responsible for full mark out of existing utilities and structures sufficiently in advance of the work to allow for a field evaluation of the routing of the work. Contractor shall not proceed with work where utilities have not been located and marked by utility companies or others.
5. The contractor shall maintain the mark out of existing utilities and structures until the work in the vicinity of the marked-out utilities and structures has progressed sufficiently in advance thereof that their location is no longer required.

B. Site Conditions
1. The locations of all utilities and structures as shown on the drawings are based on the best information available, but neither the owner nor the engineer guarantee the accuracy or completeness of the data.
2. Other utilities and structures may exist within the construction site in addition to those shown on the drawings.
3. House/building service utility lines may or may not be not shown on the drawings. The contractor shall be responsible for checking these services as to actual locations and possible interferences.

## 1.08 PROHIBITED CONSTRUCTION PROCEDURES

A. System Description
1. Prohibited construction procedures for all parts of the work include, but are not limited to, the following:
   a. Dumping of spoil material into any stream corridor, any wetlands, any surface waters, or at unspecified locations.
   b. Indiscriminate, arbitrary or capricious operation of equipment in any stream corridors, any wetlands, or any surface waters.
   c. Pumping of silt-laden water from trenches or other excavations into any surface waters, any stream corridors, or any wetlands.
   d. Damaging vegetation adjacent to or outside of the access road or right- of-way.
   e. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.
   f. Permanent or unspecified alteration of the flow line of the stream.
   g. Open burning of debris.
   h. Applying any pesticides, including defoliants, desiccants, and plant regulators, in any wetlands.
   i. Applying pesticides whose residues and metabolic products persist in the environment over extended periods of time.

j. Locating storage, stockpile, staging and de-watering controls in environmentally sensitive areas.
k. Disposal of excess excavation material in wetlands, stream corridors and flood plains.
l. Permission or other arrangements with a land owner or others shall not relieve the Contractor of compliance with the requirements of this section.
m. Any violation of the requirements of this section by the Contractor or any person employed by him will be brought to the immediate attention of the responsible regulatory agencies with a request that appropriate action be taken against the offending parties. Further, the Contractor will be required to remedy any violation at his own expense.

**1.09 CUTTING AND PATCHING**

A. System Description
1. The work includes cutting and patching as required for the removal or installation of equipment, correcting damaged concrete or masonry surfaces and for modifications to existing structures as shown on the drawings and as specified herein..
2. Patching, replacing and refinishing of concrete and masonry work shall match the adjoining work.
3. Unused openings left by removal of piping, conduit, duct and equipment, or portions disturbed during the work, shall be patched.
4. New concrete work shall be made integral with the existing concrete as shown on the drawings and in accordance with the Section "Cast in Place Concrete," Division 3.
5. Existing concrete that has been or is in contact with sewage, shall be sandblasted to a grease free condition before applying the bonding compounds. Bonding compounds shall be applied as described in the Section "Cast in Place Concrete," Division 3.
6. Exposed existing reinforcing bars shall be cleaned by wire brushing before connecting to new bars. New reinforcing bars shall be capped or welded or as shown on the drawings.
7. Where portions of existing structures and equipment are to be removed and where the remaining concrete shall be finished smooth, the Contractor shall cut off any projecting reinforcing to provide at least one inch of cover over the existing reinforcement. The concrete shall be roughened and a bonding compound applied to the existing concrete as described in the Section "Cast In Place Concrete," Division 3. Cement mortar shall be placed in excess of the finished surface and steel troweled flush with the adjacent surface.
8. When concrete is cut to provide openings for new pipe gate stems, or other penetrations, pipe sleeves shall be accurately installed and grouted in place.
9. Before patching, embedded conduits, pipes and other embedded items left in place shall be cut to at least two inches into the wall, floor or ceiling.

**1.10 COORDINATION**

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## PART 2 PRODUCTS

### 2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
   1. Each Contractor will become familiar with the Engineers Geo-Technical support attached to the specifications.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### 3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### 3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

**3.05 GENERAL INSTALLATION REQUIREMENTS**

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

**3.06 CUTTING AND PATCHING**

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

I. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

### 3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

### 3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

### 3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

### 3.10 DEMONSTRATION AND INSTRUCTION

A. See Section 01 79 00 - Demonstration and Training.

### 3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

## 3.12 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.
   1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

## 3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
   1. Competent individual shall accompany Architect and shall have authority to promptly direct corrective measures.
   2. Have sufficient craftspeople on hand at time of walk through to immediately begin corrective work.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

## 3.14 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

**END OF SECTION 01 70 00**

**SECTION 01 74 19**
**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

## PART 1 GENERAL

### 1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

### 1.02 RELATED REQUIREMENTS

A. Section 01 25 00 - Substitution Procedures.

B. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

C. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

D. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

E. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

### 1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

**1.04 SYSTEM DESCRIPTION**

A. Waste material common to construction shall include but not be limited to the following:
   1. Solid waste: Equipment and materials resulting from demolition or restoration work, large pieces of asphalt or concrete, trees, stumps, bricks, wire, fences, drums, rubbish and construction debris generated by construction activities and rubble and excess excavated material.
   2. Liquid or semi-liquid waste: Cleanings from settling tanks, digesters, lagoons, basins, manholes, sewer mains, and channels including grit, sludge, scum and miscellaneous debris.
   3. Contractor shall collect and promptly dispose of all waste materials in the project site. Clean-up shall be done and maintained on a daily basis.
   4. All materials and equipment which are not designated as re-usable or salvageable by the owner shall become the property of the Contractor. However, all materials and equipment designated as re-usable or salvageable by the owner shall be carefully removed so as to cause minimum damages and safely stored by the Contractor until accepted by the owner.
   5. Waste materials shall not be burned or buried on the work site.
   6. On contained work sites such as treatment plants or pumping stations, containers suitable for the collection and disposal of waste shall be provided by the Contractor. On transport piping contracts, collection and disposal shall be a continuous function. The Contractor shall remove all waste materials before moving to other sections of the work.
   7. Waste materials shall be disposed of at sites, approved by the NYSDEC Office of Solid Waste Management, which are compatible with the nature of materials being disposed.
   8. Waste materials shall be transported by vehicles properly licensed to transport waste by the New York State Department of Environmental Conservation.

**PART 2 PRODUCTS; NOT USED**

**PART 3 EXECUTION**

**3.01 WASTE MANAGEMENT PROCEDURES**

A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

**3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION**

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Prebid meeting.
   2. Preconstruction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

**END OF SECTION 01 74 19**

**SECTION 01 79 00**
**DEMONSTRATION AND TRAINING**

## PART 1 GENERAL

### 1.01 SUMMARY

A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Electrical systems and equipment.
   4. Access control and equipment.
   5. Items specified in individual product Sections.

### 1.02 RELATED REQUIREMENTS

A. Section 01 91 13 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.

B. Other Specification Sections: Additional requirements for demonstration and training.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Draft Training Plans: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Commissioning Authority for review and inclusion in overall training plan.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

### 1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.

C. Demonstration may be combined with Owner personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

### 3.02 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.

B. Conduct training on-site unless otherwise indicated.

C. Owner will provide classroom and seating at no cost to Contractor.

D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.

E. Provide training in minimum two hour segments.

F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.

I. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.

3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

**END OF SECTION 01 79 00**

**SECTION 01 91 13**
**GENERAL COMMISSIONING REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion.

C. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

D. The Commissioning Authority is employed by Construction Manager on behalf of Owner.

### 1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:

B. Building envelope:
   1. Air tightness.

C. Doors and hardware.
   1. Coordinate with electronic safety and security access control.

D. Plumbing Systems:
   1. Water heaters.

E. HVAC System, including:
   1. Major and minor equipment items.
   2. Piping systems and equipment.
   3. Ductwork and accessories.
   4. Terminal units.
   5. Control system.
   6. Sound control devices.
   7. Vibration control devices.
   8. Variable frequency drives.

F. Electrical Systems:
   1. Power quality.
   2. Emergency power systems.
   3. Lighting controls other than manual switches.

G. Electronic Safety and Security:
   1. Security system, including doors and hardware.
      a. Access control.
   2. Fire and smoke alarms.

H. Communications:

1. Voice systems.

I. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

### 1.03 RELATED REQUIREMENTS

A. Section 01 78 00 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

B. Section 01 79 00 - Demonstration and Training: Scope and procedures for Owner personnel training.

### 1.04 REFERENCE STANDARDS

A. CSI/CSC MF - Masterformat; 2016.

B. PECI (Samples) - Sample Forms for Prefunctional Checklists and Functional Performance Tests; Current Edition.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Architect; in that case, submit to Architect first.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word 2010 preferred.
   5. As soon as possible after submittals made to Architect are approved, submit copy of approved submittal to the Commissioning Authority.

B. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
   1. Manufacturer's product data, cut sheets, and shop drawings.
   2. Manufacturer's installation instructions.
   3. Startup, operating, and troubleshooting procedures.
   4. Fan and pump curves.
   5. Factory test reports.
   6. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.

C. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.

D. Startup Plans and Reports.

E. Completed Prefunctional Checklists.

F. Commissioning Issues Log:
   1. Construction observations.
   2. Supporting photographs.

## PART 2 PRODUCTS

### 2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:

1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F (0.3 degree C) and resolution of plus/minus 0.1 degree F (0.05 degree C).
2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.
3. Calibration: According to the manufacturer's recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. 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.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
1. Dataloggers required to for Functional Tests will be provided by the Commissioning Authority and will not become the property of Owner.

## PART 3 EXECUTION

### 3.01 COMMISSIONING PLAN

A. Commissioning Authority has prepared the Commissioning Plan.
1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

### 3.02 DOCUMENTATION IDENTIFICATION SYSTEM

A. Give each submitted form or report a unique identification; use the following scheme.

B. Type of Document: Use the following prefixes:
1. Startup Plan: SP-.
2. Startup Report: SR-.
3. Prefunctional Checklist: PC-.
4. Functional Test Procedure: FTP-.
5. Functional Test Report: FTR-.

C. System Type: Use the first 4 digits from CSI/CSC MF (Master Format), that are applicable to the system; for example:
1. 2300: HVAC system as a whole.
2. 2320: HVAC Piping and Pumps.
3. 2330: HVAC Air Distribution.

D. Component Number: Assign numbers sequentially, using 1, 2, or 3 digits as required to accommodate the number of units in the system.

E. Test, Revision, or Submittal Number: Number each successive iteration sequentially, starting with 1.

F. Example: PC-2320-001.2 would be the Prefunctional Checklist for equipment item 1 in the HVAC piping system, probably a pump; this is the second, revised submittal of this checklist.

### 3.03 STARTUP PLANS AND REPORTS

A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.

B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

C. Submit directly to the Commissioning Authority.

### 3.04 PREFUNCTIONAL CHECKLISTS

A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer’s start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.
   4. PECI (Samples) found at http://www.peci.org/library/mcpgs.htm indicate anticipated level of detail for Prefunctional Checklists.

B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
   1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
   2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
   3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
   4. If any Checklist line item is not relevant, record reasons on the form.
   5. Contractor may independently perform startup inspections and/or tests, at Contractor's option.
   6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.

7. Submit completed Checklists to Commissioning Authority within two days of completion.

C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
   1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in Contract Documents.
   2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
   3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in Contract Documents or not.
   4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
   1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
   2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
   1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

**3.05 FUNCTIONAL TESTS**

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
   1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with Contract Documents or does not perform properly.
   2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
   3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
   4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
   5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:
   1. Some test procedures are included in Contract Documents; where Functional Test procedures are not included in Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.

2. Examples of Functional Testing:
    a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
    b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.
    c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.
    d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Authority is Functional Testing.
3. PECI (Samples) found at http://www.peci.org/library/mcpgs.htm indicated anticipated level of detail for Functional Tests.

F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

**3.06 SENSOR AND ACTUATOR CALIBRATION**

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gauges, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Commissioning Authority and Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:
1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
2. Verify that sensors with shielded cable are grounded only at one end.
3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F (0.1 degree C) of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:
1. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
2. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.
1. Disconnect sensor.
2. Connect a signal generator in place of sensor.
3. Connect ammeter in series between transmitter and building automation system control panel.
4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.

6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
7. Record all values and recalibrate controller as necessary to comply with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
8. Reconnect sensor.
9. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
10. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
11. If not, replace sensor and repeat.
12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
1. Watthour, Voltage, Amperage: 1 percent of design.
2. Pressure, Air, Water, Gas: 3 percent of design.
3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F (0.2 degree C).
4. Relative Humidity: 4 percent of design.
5. Barometric Pressure: 0.1 inch of Hg (340 Pa).
6. Flow Rate, Air: 10 percent of design.
7. Flow Rate, Water: 4 percent of design.
8. AHU Wet Bulb and Dew Point: 2.0 degrees F (1.1 degrees C).

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. 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 to 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).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
1. With full pressure in the system, command valve closed.
2. Use an ultra-sonic flow meter to detect flow or leakage.

**3.07 TEST PROCEDURES - GENERAL**

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
2. Sampling is not allowed for:
a. Major equipment.

b. Life-safety-critical equipment.
c. Prefunctional Checklist execution.

3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
7. If YY percent of the units in the second sample fail, test all remaining identical units.
8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:

1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Authority’s request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
2. Other points will be monitored by the Commissioning Authority using dataloggers.
3. At the option of the Commissioning Authority, some control system monitoring may be replaced with datalogger monitoring.
4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
5. Graphical output is desirable and is required for all output if the system can produce it.
6. Monitoring may be used to augment manual testing.

## 3.08 BUILDING ENVELOPE COMMISSIONING

A. General: Comply with the following procedural requirements:

B. Verify that the building envelope has been sufficiently completed for testing to commence.

## 3.09 OPERATION AND MAINTENANCE MANUALS

A. See Section 01 78 00 - Closeout Submittals for additional requirements.

B. Add design intent documentation furnished by Architect 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.

**END OF SECTION 01 91 13**

**SECTION 01 91 13.01**
**SUPPLEMENTAL GENERAL MEP COMMISSIONING REQUIREMENTS**

## PART 1 - GENERAL

### 1.01 OVERVIEW

A. This section of the specification describes the process for commissioning, defines the responsibilities of the contractors and design professionals, and outlines the duties of other members of the commissioning team.

B. The commissioning process shall be applied to all equipment, components, and systems as listed in this section, including specific interfaces to and from equipment and systems provided under separate contracts.

C. Building Commissioning work is a joint team effort to ensure that all systems function together properly to meet the design intent, and to document system performance parameters for fine-tuning of control sequences and operations procedures. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment start-up, control system calibration, testing and balancing, training, and performance testing. This section does not supersede other requirements of the specification though, it may, expand on some of them.

### 1.02 THE COMMISSIONING TEAM

A. The commissioning team shall consist of:
   1. Design Engineer (DE)
   2. Mechanical Contractor (MC)
   3. Plumbing Contractor (PC)
   4. Electrical Contractor (EC)
   5. General Contractor (GC)
   6. Temperature Controls Contractor (TC)
   7. All appropriate Contractors and Sub-Contractors
   8. Approved Representatives of Mechanical, Electrical and Equipment Manufacturers
   9. Design Architect (ARCH)
   10. Facility Staff (FS)
   11. Owner's Representative (OR)

### 1.03 STANDARD AND CODE COMPLIANCE

A. Commissioning will be accomplished to comply with, and in accordance with the requirements of the following:
   1. 2015 International Energy Conservation Code (IECC) Section, C408 System Commissioning. 2020 Energy Conservation Construction Code of New York State, Section C408 System Commissioning.

### 1.04 COORDINATION

A. Management - The Contractor(s) coordinates the commissioning activities through the Owner's Representative (OR). All members shall work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.

B. Scheduling - The Contractors, through the OR, will provide sufficient time for scheduling commissioning activities with respect to the Owner's participation. The Contractors will integrate all commissioning activities into the overall project schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.

### 1.05 COMMISSIONING PLAN

A. The Design Engineer will develop the Commissioning Plan which shall be followed by the installing contractors.

B. The Commissioning Plan shall contain the information necessary to document the commissioning process.

C. The Commissioning Plan will include the following:
   1. Narrative description of the activities that will be accomplished during the commissioning process.
   2. List of the specific equipment and systems which are scheduled to be commissioned.
   3. Functions to be tested.
   4. Conditions under which the testing will be performed.
   5. Measurable criteria of acceptable performance.

## 1.06 COMMISSIONING PROCESS

A. The following narrative provides a brief overview of the commissioning tasks that shall be performed during construction and the general order in which they occur.
   1. The prefunctional checklists, developed by the Contractor(s), are to be completed before and during the startup process.
   2. Prefunctional checklists, TAB and startup must be completed before functional performance testing.
   3. Items of non-compliance in material, installation, or setup shall be corrected at no expense to the Owner.
   4. The Contractor ensures that the Subcontractors' prefunctional checklists are executed and documented and that startup and initial checkout are performed. The DE verifies that the TAB has been completed.
   5. The Contractor(s) develops equipment and system functional test procedures.
   6. The performance tests are executed by the Contractor in cooperation with the OR with the assistance of the facility staff.
   7. The Contractor provides the Commissioning Record.
   8. Commissioning is to be completed before substantial completion.
   9. Deferred testing and/or seasonal verifications are to be conducted as specified or required.
   10. Design Engineer (DE) confirms that commissioning activities have been completed.

## 1.07 DESCRIPTION OF WORK

A. Commissioning will be performed for the following equipment and systems, and as described in the 2015 International Energy Conservation Code (IECC) Section, C408 System Commissioning. 2020 Energy Conservation Construction Code of New York State, Section C408 System Commissioning.
   1. HVAC Systems
   2. HVAC System Testing and Balancing
   3. Temperature Control Systems
   4. Lighting Controls, Occupancy Sensors, Time Switch Controls, Daylight Controls, Photo Sensor Controls, Programmable Controls, Vacancy Sensors
   5. Domestic Hot Water Equipment

B. The Contractors shall review and verify the commissioning activities to meet the Owner's project schedule and requirements for the interface between all trades in order to prevent delays in the Commissioning Process.

C. Seasonal commissioning is required under full load conditions during peak heating and peak cooling seasons, as well as part load conditions in the spring and fall. Simulations of peak load conditions may be implemented to allow for complete commissioning of the work.

D. Systems that are not weather dependent shall be tested under full and partial load to the fullest extent possible.

## 1.08 ROLES AND RESPONSIBILITIES

A. Design Engineer/Professional:

1. Develops the Commissioning Plan.
2. Include commissioning requirements in the project construction documents.
3. Confirm, upon project completion, that commissioning has been performed by the Contractor(s) or their authorized representative.

B. Contractor(s):
1. Follow the general commissioning process as outlined in the Commissioning Plan.
2. Develop and utilize Prefunctional Checklists and Functional Test Procedures for all equipment/systems to be commissioned.
3. Provide and document all air and water systems balancing required for the project.
4. Prepare a preliminary commissioning report. This report will minimally include the following:
   a. List of deficiencies identified during functional performance testing.
   b. Listing of deferred or seasonal testing that cannot be completed at this time.
   c. Listing of climatic conditions that will be required to conduct deferred/seasonal tests.
   d. Functional Performance Test reports completed to date.
5. Make available a copy of the preliminary commissioning report to the Code Office having jurisdiction.
6. Develop an operations and maintenance manual to be provided to the Owner that will minimally include the following (Some of these items may be addressed elsewhere in the project specifications):
   a. Submittal data of equipment requiring maintenance.
   b. Manufacturer's maintenance manual for all commissioned equipment.
   c. Name, address, and contact information for all relevant service agencies.
   d. Building direct digital control system information including wiring diagrams, schematics and sequences of operations.
   e. Lighting and lighting control system submittals.
   f. Schedule for inspection of lighting control systems.
   g. General narrative of how each commissioned system is intended to operate.
7. Develop a final commissioning report to be delivered to the building Owner. The report will minimally include the following:
   a. Functional Performance Testing results.
   b. Final results of previously identified system deficiencies.
   c. Functional testing procedure documentation.

C. Owner:
1. Participate in the contractor performed training sessions to the extent possible.
2. Provide any system operation schedules and set point information available to the contractor to allow for proper system start-up and operation.

## 1.09 REFERENCES

A. Systems commissioning shall generally be accomplished in accordance with the latest version of commissioning publications from one the following industry associations:
1. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Guideline 1.1, HVAC&R Technical Requirements for the Commissioning Process.
2. Associated Air Balancing Council, Commissioning Reference Manual.
3. Building Commissioning Association - The Building Commissioning Handbook.

## 1.10 DOCUMENTATION

A. Each Contractor shall provide to the OR three (3) copies of the following items as soon as they become available:
1. Certified and approved start-up and testing report forms for all subsystem equipment that comprise the System. Commissioning documentation shall include control schematics of the total system and all subsystems.
2. Records of required inspections for code compliance, and documentation of approved permits and licenses to operate components of the system.

3. Operating data which shall include all necessary instructions to the Owner's operating staff in order to operate the system to specified performance standards.
4. Maintenance data which shall include all necessary information required to maintain all equipment in continuous operating condition, such as the testing, balancing and adjusting report and the as-built drawings.
5. Written notice that building equipment and systems have been completed, tested and are fully operational.
6. Checklist of all submitted contract deliverables such as; operation and maintenance manuals, spare parts, warranties, training, documentation, etc.

## PART 2 - PRODUCTS

### 2.01 TESTING

A. The Contractor shall provide any equipment or device required for access such as platforms, scaffolds, and spare filters as may be necessary for all verification and testing.

B. All standard testing equipment required to perform startup and initial checkout and required performance testing shall be provided by the Contractor for the equipment being tested.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance within the tolerances specified in the specifications, calibration certification will be provided.

## PART 3 - EXECUTION

### 3.01 DESIGN CRITERIA AND INTENT

A. Design criteria and intent shall be as described in the technical specification sections and contract drawings. The basis of design developed by the DE will be also referenced.

### 3.02 MEETINGS

A. Initial Meeting:
   1. The Contractor(s), through the OR, will schedule, plan and conduct an initial commissioning meeting. The Contractors and their responsible parties are required to attend.

### 3.03 STARTUP, CONSTRUCTION CHECKLISTS AND INITIAL CHECKOUT

A. The following procedures apply to all equipment/systems to be commissioned.

B. General: Prefunctional checklists are required to verify that the equipment and systems are fully connected and operational. The prefunctional checklists for a given system must be successfully completed and approved prior to startup and formal performance testing of equipment or subsystems of the given system.

C. Startup and Checkout Plan: The Contractors shall develop prefunctional checklists and startup shall be identified in the commissioning scoping meeting and on the checklist forms.
   1. The Contractor/Subcontractor responsible for the purchase of the equipment shall develop the full startup plan by combining the manufacturer's detailed startup and checkout procedures and the prefunctional checklists.

D. Execution of Construction Checklists and Startup:
   1. The Owner and facility personnel as necessary, shall observe procedures for primary equipment.
   2. For lower-level components of equipment, (e.g., sensors, controllers), the OR shall be offered the opportunity to observe a sampling of the startup procedures.
   3. The Contractors, Subcontractors and Vendors shall execute startup and provide the OR with a signed and dated copy of the completed startup and construction checklists.
   4. Only individuals employed by the Contractor (Technicians, Engineers, Tradesmen, Vendors, etc.) who have direct knowledge and witnessed that a line item task on the construction checklist was actually performed shall check off that item. It is not acceptable for non-witnessing onsite supervisors to fill out these forms.

E. Deficiencies, Non-Conformance, and Approval of Checklists and Startup (Master Issues Log):
   1. The Contractor shall ensure that the Subcontractors clearly list any outstanding items of the initial startup and construction checklist procedures that were not completed successfully, on an attached sheet. The form and any outstanding deficiencies shall be provided, to the OR within two (2) days of test completion.

**3.04 FUNCTIONAL PERFORMANCE TESTING**

A. Requirements: The functional performance testing shall demonstrate that each system is operating according to the documented design intent and contract documents. Functional performance testing facilitates bringing the systems from a state of individual substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.

**3.05 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS**

A. Documentation: The Contractors shall complete all documentation for performance testing.

**3.06 DEFERRED TESTING**

A. Unforeseen Deferred Tests: If any check or test cannot be completed due to the project completion level, weather conditions, or time of season, execution of checklists and functional performance testing may be delayed upon approval of the OR. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Contractors will not be due any additional compensation.

B. Seasonal Testing: During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The Contractor shall coordinate this activity through the OR. Any final adjustments to the O&M manuals and as-built's due to the testing shall be made by the Contractor.

**3.07 COMMISSIONING RECORD**

A. The Contractor is responsible to compile, organize and index the following commissioning data, for all commissioned equipment into labeled, indexed and tabbed, or in an electronic format, as preferred by the Owner.
   1. Commissioning Plan. (Design Engineer provided.)
   2. System reports including available design narratives and criteria including sequences. Each system shall contain the startup plan and report, approvals, corrections, construction checklists, completed performance tests, trending and analysis, training plan and recommended recommissioning schedule.
   3. Complete issues log inclusive of all items and resolutions.
   4. Final Commissioning Report including an executive summary and a list of participants and roles.
   5. All outstanding non-compliance items shall be specifically listed. Recommendations for improvement to equipment or operations, future actions, commissioning process changes, etc. shall also be listed. Each non-compliance issue shall be referenced to the specific performance test, inspection, trend log, etc. where the deficiency is documented.

**END OF SECTION 01 91 13.01**

# COMMISSIONING PLAN

## Construction Phase
## Town of Montgomery – Police Department – New Station

**Submitted to:**
ADG Architects
25 Wallkill Ave
Montgomery, NY 12549

**Submitted from**:
M/E Engineering, P.C.
433 State Street, 4th Floor
Schenectady, NY  12305

August 15, 2024
M/E Reference 233326

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# Commissioning Plan

# Project: Town of Montgomery Police Department – New Station

# Date: August 15, 2024

**1. Overview**

A. Definitions:

1. Acceptance: A contractually defined action that permits an activity to commence or continue.
2. Basis of Design: A document that records the concepts, calculations, decisions, and product selections used to meet the Owner's Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
3. Commissioning: See Commissioning Process.
4. Commissioning Activity: A component of the Commissioning Process.
5. Commissioning Field Report: A document that records the activities and results of the Commissioning Process.
6. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the Commissioning Process.
7. Commissioning Process: A quality-focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements.
8. Commissioning Process Progress and Approval Form: A document that indicates activities completed as part of the Commissioning Process, approval status of the activities, and significant findings from those activities; it is continuously updated during the course of a project.
9. Commissioning Team: The individuals who through coordinated actions, are responsible for implementing the Commissioning Process.
10. Construction Documents: This includes a wide range of documents, which will vary from project to project, Owner's needs, regulations, laws, and countries. Construction documents usually include the project manual (specifications), plans (drawings) and General terms of the contract, especially those required by subcontractors and manufacturer's representative, suppliers and manufacturers of equipment, assemblies and systems.
11.

Continuous Commissioning Process: A continuation of the Commissioning Process well into the Occupancy and Operations Phase to verify that a project continues to meet current and evolving Owner's Project Requirements. The Continuous Commissioning Process activities are on-going for the life of the facility.

12. Contract Documents: This includes a wide range of documents, which will vary from project to project, owner's needs, regulations, laws, and countries. It frequently includes price agreements, construction management process, subcontractor agreements or requirements, requirements and procedures for submittals, changes, and other construction requirements, timeline for completion, and the Construction Documents.
13. Coordination Drawings: Drawings showing the work of all trades to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances.
14. Functional Test Procedure: A written protocol that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.
15. Verification: The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the Owner's Project Requirements.

B. Commissioning Scope:
1. Commissioning is a systematic process of ensuring that selected systems perform interactively according to the design intent and the owner's operational needs. This is achieved by beginning in the design phase, documenting the design intent and continuing through construction, acceptance and the warranty period with actual verification of performance.

C. Commissioned Systems:
1. The following equipment and systems will be commissioned in this project by the respective contractors. Refer to Section 5 for additional details. All general references to equipment in this document refer only to equipment that is to be commissioned.
   a. **HVAC Systems**
   b. **HVAC System Testing and Balancing**
   c. **Temperature Control Systems**
   d. **Lighting Controls, Occupancy Sensors, Time Switch Controls, Daylight Controls, Photo Sensor Controls, Programmable Controls, Vacancy Sensors**
   e. **Domestic Hot Water Equipment**

## 2. General Building Information

Project: _____

Location: _____

Building Type: _____

## 3. Commissioning Team Members

| Team Member | Co. & Contact Names | Office, Cell, Fax, Email |
|---|---|---|
| **Owner** | | |
| Primary Contact | | |
| **Architect** | | |
| Project Architect | | |

| Team Member | Co. & Contact Names | Office, Cell, Fax, Email |
|---|---|---|
| **Engineer** | | |
| Design Engineer | | |
| **Construction Contractors** | | |
| | | |

**4. Contractors/Sub-Contractors**

A. **Mechanical**
B. **Electrical**
C. **Plumbing**
D. **General**
E. **Testing and Balancing**
F. **Direct Digital Controls**
G. **Other**

Note: Contractor(s) will be responsible for providing the project commissioning services in accordance with the requirements of the project Specification Section 019113, applicable code(s) and this Commissioning Plan.

**5.**

**Commissioning Process**

A. This section sequentially details the commissioning process by commissioning task or activity.

1. Commissioning Scoping Meeting:

a. A commissioning scoping meeting is planned and conducted by the Contractor. In attendance are the respective representatives of the Owner, Facility Staff, DE and the mechanical, electrical, controls, and TAB Contractor. At the meeting, commissioning parties are introduced and the commissioning process is reviewed, and management and reporting lines determined. The Cx Plan is reviewed, process questions are addressed, lines of reporting and communications determined and the work products list discussed.

2. Miscellaneous Management Protocols:

a. The following protocols will be used on this project:

| Issue | Protocol |
|---|---|
| Scheduling of Commissioning Tasks | Contractor provides to Owner's Representative. |
| Question/Clarifications in regards to Commissioning Specification and/or Commissioning Plan | Contractor provides to Design Engineer. |
| Schedule of Training | Contractor provides to Owner's Representative who will notify Owner. |
| Turnover of Commissioning Documentation | Contractor delivers to Owner's Representative. |
| For Scheduling Commissioning Activities | Contractor to coordinate with Owner's Representative. |
| For Commissioning Deficiencies | Contractor notifies Owner's Representative and resolves deficiencies with Subcontractor and Equipment Manufacturer Representatives |

3. Execution of Pre-functional Checklists and Startup:

a. The contractors and manufacturer's representatives execute and submit a signed copy of the completed start-up reports and/or Prefunctional checklists to the OR. Further details are found in the Contract Documents.

4. Deficiencies and Non-Conformance:

a. The Contractor works with the subcontractors and or manufacturer's representative to correct and retest deficiencies or uncompleted items, with involvement from the DE and others as required. The installing contractors or manufacturer's representatives correct all areas that are deficient or incomplete according to the start-up tests.

5. Execution of Functional Testing Procedures:

a. Overview and Process:

1) The Contractor schedules functional tests through the OR. The Contractor personnel oversees, witnesses and documents the functional testing of all equipment and systems according to the Contract Documents and the Cx Plan. The Contractors execute the tests. The control system is tested before it is used to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems and finally to interlocks and connections between systems.

b. Deficiencies and Retesting:

1) The Contractor documents the results of the test. Corrections of minor deficiencies identified are made during the tests. The Contractor records the results of the test on the procedure or test form. Deficiencies or non-conformance issues are noted and reported to the OR. Contractors correct all deficiencies, notify the OR. Contractor will schedule re-testing with OR.

c. Commissioning Record:

1) The Contractor will compile, organize and index the following commissioning data by equipment/system into labeled, indexed and tabbed, three-ring binders or electronically, based on Owner preference.

2) The Final Commissioning Record is provided to the Owner and Design Engineer for review.

**END OF COMMISSIONING PLAN**

**SECTION 03 30 00**
**CAST-IN-PLACE CONCRETE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Concrete formwork.

B. Floors and slabs on grade.

C. Concrete footings and foundation walls.

D. Concrete reinforcement.

E. Joint devices associated with concrete work.

F. Miscellaneous concrete elements, including equipment and housekeeping pads.

### 1.02 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

### 1.03 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 03 35 11 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.

C. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

D. Section 31 23 23 - Fill: Drainage fill under slabs-on-grade..

E. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

### 1.04 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.

C. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).

D. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

E. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

F. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2019.

G. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

H. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

I. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2024.

J. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.

K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2023.

L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.

M. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2023.

N. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

O. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

P. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.

Q. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2023.

R. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

S. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

T. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2023.

U. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).

V. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.

W. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2023.

X. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.

Y. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2021.

Z. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2024.

AA. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.

BB. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.

CC. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.

DD. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

EE. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

FF. ASTM D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction; 2012 (Reapproved 2022).

GG. ASTM D471 - Standard Test Method for Rubber Property--Effect of Liquids; 2016a (Reapproved 2021).

HH. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.

II. ASTM D1752 - Standard Specification for Preformed Sponge Rubber, Cork, and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2018 (Reapproved 2023).

JJ. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

KK. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

LL. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2023.

MM. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.

NN. ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric); 2014.

OO. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

PP. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop; 1974.

**1.05 SUBMITTALS**

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturers' data for each type of product indicated; showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
   2. For chemical-resistant waterstops, provide data on ASTM D471 test results.
   3. For membrane-forming, moisture emission-reducing, curing and sealing compound, provide manufacturer's installation instructions,.

C. Mix Design: Submit proposed concrete mix design.
   1. For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
      a. Indicate amounts of mixing water to be withheld for later addition at Project site.
   2. Indicate proposed mix design complies with fiber reinforcing manufacturer's written recommendations.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Samples: Submit two, 12 inch (305 mm) long samples of waterstops and construction joint devices.

F. Shop Drawings:
   1. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
   2. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
      a. Location of construction joints is subject to approval of the Architect.

G. Test Reports: Submit report for each test or series of tests specified.
   1. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
      a. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

H. Minutes of pre-installation conference.

I. Certificates:
   1. Welding certificates.
   2. Material Certificates: For each of the following, Cementitious materials, Admixtures, Form materials and form-release agents, Steel reinforcement and accessories, Fiber reinforcement, Waterstops, Curing compounds, Floor and slab treatments, Bonding agents, Adhesives, Vapor retarders, Semirigid joint filler, Joint-filler strips, and Repair

materials signed by manufacturers:

J. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
   1. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
   2. Field quality-control reports.

**1.06 QUALITY ASSURANCE**

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.

B. Follow recommendations of ACI PRC-305 when concreting during hot weather.

C. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

D. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

E. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

F. 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.

G. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

H. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

I. Preinstallation Conference: Conduct conference at Project site.
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Ready-mix concrete manufacturer.
      c. Concrete subcontractor.
   2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

**1.07 DELIVERY, STORAGE AND HANDLING**

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

## PART 2 PRODUCTS

### 2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
   2. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
   3. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   4. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
      a. Plywood, metal, or other approved panel materials.
      b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
         1) High-density overlay, Class 1 or better.
         2) Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
         3) Structural 1, B-B or better; mill oiled and edge sealed.
         4) B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
      c. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
      d. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
   5. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
   6. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
   7. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
      a. Formulate form-release agent with rust inhibitor for steel form-facing materials.
   8. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
      a. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
      b. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
      c. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

### 2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Type: Deformed billet-steel bars.

B. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.

C. Plain-Steel Wire: ASTM A1064/A1064M, as drawn.

D. Deformed-Steel Wire: ASTM A496.

E. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

F. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

**2.03 CONCRETE MATERIALS**

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

B. Water: ASTM C94/C94M and potable.

C. Cement: ASTM C150/C150M, Type I - Normal or Type II - Moderate Portland type gray.

D. Normal Weight Fine and Coarse Aggregates: ASTM C33/C33M Class 3M coarse aggregate or better, graded.
   1. Acquire aggregates for entire project from same source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
      a. Maximum Coarse-Aggregate Size: 1 inch nominal.
      b. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

E. Lightweight Aggregate: ASTM C330/C330M.

F. Fly Ash: ASTM C618, Class C or F.

G. Water: ASTM C94/C94M, ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

**2.04 ADMIXTURES**

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
   2. Retarding Admixture: ASTM C494/C494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

**2.05 UNDERSLAB FILL**

A. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C33/C33M for fine aggregates.

**2.06 CURING MATERIALS**

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, dissipating.
   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. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
      b. BASF Construction Chemicals - Building Systems; Kure 200.
      c. ChemMasters; Safe-Cure Clear.
      d. Conspec by Dayton Superior; W.B. Resin Cure.
      e. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
      f. Edoco by Dayton Superior; Res X Cure WB.
      g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
      h. Kaufman Products, Inc.; Thinfilm 420.
      i. Lambert Corporation; AQUA KURE - CLEAR.
      j. L&M Construction Chemicals, Inc.; L&M Cure R.
      k. Meadows, W. R., Inc.; 1100-CLEAR.
      l. Nox-Crete Products Group; Resin Cure E.
      m. Right Pointe; Clear Water Resin.
      n. SpecChem, LLC; Spec Rez Clear.
      o. Symons by Dayton Superior; Resi-Chem Clear.
      p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
      q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
      r. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.07 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

C. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
   3. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

## 2.08 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4000 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.50.
   3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
   4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

B. Foundation Walls: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4000 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.50.
   3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
   4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4000 psi at 28 days.
   2. Minimum Cementitious Materials Content: 520 lb/cu. yd.
   3. Slump Limit: 5 inches, plus or minus 1 inch.
   4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
   5. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than1.5 lb/cu. yd.

D. Suspended Slabs: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 3500 psi at 28 days.
   2. Minimum Cementitious Materials Content: 520 lb/cu. yd.
   3. Slump Limit: 4 inches plus or minus 1 inch.
   4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

E. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: As indicated on Drawings.
   6. Maximum Aggregate Size:As indicated on Drawings.

F. Structural Lightweight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3500 pounds per square inch.
   2. Cement Content: Minimum As indicated on Drawings.
   3. Water-Cement Ratio: As indicated on Drawings.
   4. Total Air Content: 3 percent, determined in accordance with ASTM C173/C173M.
   5. Maximum Slump: 3 inches.
   6. Maximum Aggregate Size: As indicated on Drawings.
   7. Maximum dry unit weight: 115 pound per cubic foot.

G. Lean Concrete: Proportion concrete mixture in accordance with ACI CODE-318 as follows:
   1. Minimum Compressive Strength: 1200 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.60.
   3. Aggregate: Course sand, gravel, crushed stone meeting NYS Dot specifications.
   4. Slump Limit: 6 inches plus or minus 1 inch.
   5. Air Content: 8 percent, plus or minus 1.5 percent at point of delivery for 1-1/2 inch nominal maximum aggregate size.

## 2.09 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.
   1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Structural Fiber Reinforcement: ASTM C1116/C1116M.
   1. Synthetic Micro-Fiber: Monofilament or fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C1116/C1116M, Type III, 1/2 to 1-1/2 inches long.
      a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

2. Products:
    a. Axim Italcementi Group, Inc.; Fibrasol F.
    b. Euclid Chemical Company (The), an RPM company; Fiberstrand F.
    c. FORTA Corporation; FORTA Econo-Net.
    d. Grace Construction Products, W. R. Grace & Co.; Grace Fibers.
    e. Nycon, Inc.; ProConF.
    f. Propex Concrete Systems Corp.; Fibermesh 300.
    g. Sika Corporation; Sika Fiber PPF.
    h. Substitutions: See Section 01 60 00 - Product Requirements.

C. Fibirillated Microfiber Reinforcement: ASTM C1116/C1116M.
1. Fiber Type: Alkali-resistant synthetic.
2. Products:
    a. Master Builders Solutions; MasterFiber F Series: www.master-builders-solutions.com/en-us/#sle.
    b. Axim Italcementi Group, Inc.; Fibrasol F.
    c. Euclid Chemical Company (The), an RPM company; Fiberstrand F.
    d. FORTA Corporation; FORTA Econo-Net.
    e. Grace Construction Products, W. R. Grace & Co.; Grace Fibers.
    f. Nycon, Inc.; ProConF.
    g. Propex Concrete Systems Corp.; Fibermesh 300.
    h. Sika Corporation; Sika Fiber PPF.

## 2.11 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

E. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

F. Accelerating Admixture: ASTM C494/C494M Type C.

G. Retarding Admixture: ASTM C494/C494M Type B.

H. Water Reducing Admixture: ASTM C494/C494M Type A.

## 2.12 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:
1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
3. Products:
    a. ISI Building Products; Viper VaporCheck II 10-mil (Class A): www.isibp.com/#sle.
    b. Stego Industries, LLC StegoWrap 10 mil Class A: www.stegoindustries.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.
1. Grout: Comply with ASTM C1107/C1107M.
2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
    a. Maximum: Plus 4 percent.
    b. Minimum: Plus 1 percent.

3. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch (13.7 MPa).

C. REPAIR MATERIALS
   1. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
      a. Cement Binder: ASTM C150/C150M, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
      b. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
      c. Aggregate: Well-graded, washed gravel, 1/8 to ¼ inch or coarse sand as recommended by underlayment manufacturer.
      d. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C109/C109M.
   2. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
      a. Cement Binder: ASTM C150/C150M, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
      b. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
      c. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
      d. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C109/C109M.
   3. Pre-packaged Repair Mix:
      a. Manufacturer, Basis of Design: Edison Coatings, Inc.; www:edisoncoatings.com
         1) Ardex : www.ardexamericas.com
         2) Substitutions: See Section 01 60 00 - Product Requirements.
         3) Patching compound shall be a prepackaged, 1-component, acrylic polymer modified blend of Portland cement, specially graded aggregates and admixtures, designed for low shrinkage, low stress cure, and compatibility with existing host concrete. Prior to patching, sample cores of existing concrete shall be delivered by Contractor to manufacturer for testing and evaluation. Patching compound shall be customized by manufacturer, so that compressive strength does not exceed 4000 psi, or 500 psi above the existing concrete's compressive strength, whichever is lower, as measured by ASTM C109/C109M.
            (a) Patching compound shall develop a minimum 200 psi direct tensile adhesion with host substrate, when applied in accordance with these specifications.
            (b) Tensile strength of patching compound shall be a minimum of 400 psi. Flexural modulus shall be 1.1 x 106 psi. Material must be vapor permeable, with a minimum permeance of 8 perms at 1/2" depth as measured by ASTM E96/E96M.
            (c) Water used for cleaning, mixing and finishing shall be clean, potable, free from oil, acid, injurious amounts of vegetable matter, alkalies or other salts.
            (d) No colorants, accelerators, bonding agents or other additives shall be added to the patching compound without express written direction of the manufacturer.
         4) Products:
            (a) Edison 44-Regular for horizontal surfaces.
            (b) Edison System 44-V/O for vertical and overhead surfaces.
            (c) Edison Flexi-Seal 510.

(1) Crack sealant for small cracks shall be an 100% solids, 2-component elastomeric epoxy with 110% elongation and minimum 1200 psi tensile strength as measured by ASTM D412.

(d) Edison SYSTEM 49 CPBA.

(1) Primer and reinforcing steel primer/corrosion inhibitor shall be an alkaline, silica fume modified, latex modified cementitious coating.

(e) Substitutions: See Section 01 60 00 - Product Requirements.

D. Bonding and Jointing Products

1. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
2. Epoxy Bonding System:
   a. Complying with ASTM C881/C881M and of Type required for specific application.
      1) Two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
      2) Types I and II, non-load bearing Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
3. Waterstops: PVC, complying with COE CRD-C 572.
   a. Configuration: As indicated on drawings.
   b. Size: As indicated on drawings.
4. Waterstops: Bentonite and butyl rubber.
   a. Configuration: As indicated on drawings.
   b. Size: As indicated on drawings.
5. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
   a. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
   b. Size: As indicated on drawings.
6. Slab Isolation Joint Filler: 1/2-inch (13 mm) thick, height equal to slab thickness, with removable top section forming 1/2-inch (13 mm) deep sealant pocket after removal.
   a. Expansion and Isolation Joint Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
7. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.
   a. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
   b. Height: To suit slab thickness.
8. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D2240.
9. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
10. Plate Dowel System: Steel plate dowel and plastic dowel sleeve; with integral fasteners for attachment to formwork.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Grounding Installation:

1. The Concrete Contractor shall make certain that the conductor for building steel grounding has been installed.

## 3.02 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   1. Class A, 1/8 inch for smooth-formed finished surfaces.
   2. Class C, 1/2 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Re-tighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

## 3.03 EMBEDDED ITEMS

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.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
   2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete at exterior walls, where flashing is shown at lintels, and other conditions.

## 3.04 REMOVING AND REUSING FORMS

A. General: Formwork for sides of walls, piers, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

**3.05 VAPOR RETARDERS**

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
   1. Lap joints 6 inches and seal with manufacturer's recommended tape.

**3.06 STEEL REINFORCEMENT**

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

**3.07 JOINTS**

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
   1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
   1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
   2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
   3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

**3.08 CONCRETE PLACEMENT**

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306R.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:
   1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

**3.09 FINISHING FORMED SURFACES**

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces not exposed to public view.

B. 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 defects. Remove fins and other projections that exceed specified limits on formed-surface

irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
   1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
   2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
   3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part Portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. 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.

### 3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
   1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings to receive mortar setting beds for bonded cementitious floor finishes

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
   1. Apply float finish to surfaces indicated to receive trowel finish.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
   2. Finish surfaces to the following tolerances, according to ASTM E1155, for a randomly trafficked floor surface.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

## 3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

## 3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306R.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. 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. Formed Surfaces: Cure formed concrete surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, and other surfaces.

E. Cure concrete according to ACI 308R.1, 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 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, 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.
      a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
      b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
      c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
   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.
      a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a 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. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
   1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
   2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
   3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
   2. After concrete has cured at least 14 days, correct high areas by grinding.
   3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
   4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
   5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor

elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

**3.15 FIELD QUALITY CONTROL**

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
1. Steel reinforcement placement.
2. Headed bolts and studs.
3. Verification of use of required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
3. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM A1064/A1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C31/C31M.
    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C39/C39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E1155 within 24 hours of finishing.

### 3.16 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
    1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
    2. Under Raised Access Flooring: F(F) of 20; F(L) of 15, on-grade only.
    3. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
    4. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
    5. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
    6. Parking Structure: F(F) of 20; F(L) of 15, on-grade only.

B. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 ASTM E1155M, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### 3.17 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards (76 cu m) or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

H. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

**3.18 DEFECTIVE CONCRETE**

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

**3.19 PROTECTION**

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**END OF SECTION 03 30 00**

**SECTION 03 35 11**
**CONCRETE FLOOR FINISHES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Surface treatments.

B. Liquid densifiers and hardeners.

C. Clear coatings.

### 1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

C. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

### 1.04 FIELD CONDITIONS

A. Maintain light level equivalent to a minimum 200 W light source at 8 feet (2.5 m) above the floor surface over each 20 foot (6 m) square area of floor being finished.

B. Maintain ambient temperature of 50 degrees F (10 degrees C) minimum.

## PART 2 PRODUCTS

### 2.01 APPLICATIONS

A. Densifier and Hardener:
   1. Concrete Floor Finish
      a. Concrete densifier and hardener; Level 2 finish, Lithium Silicate.
   2. Use at the following locations: all interior concrete slabs.

### 2.02 DENSIFIERS AND HARDENERS

A. Liquid Densifier and Hardener: Penetrating chemical compound that reacts with concrete, filling the pores and dust proofing; for application to concrete after set.
   1. Composition: Lithium silicate.
   2. Products:
      a. Sika Corp.; SCOFIELD® Formula One™ Lithium Densifier MP: www.usa.sika.com.
      b. Concrete Sealers USA: www.concretesealersusa.com/#sle.
      c. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
      d. Euclid Chemical Company; ULTRASIL LI+: www.euclidchemical.com/#sle.
      e. Master Builders Solutions: www.master-builders-solutions.com/en-us/#sle.
      f. PROSOCO, Inc; Consolideck LS: www.prosoco.com/consolideck/#sle.
      g. SpecChem, LLC; LithSeal SC: www.specchemllc.com/#sle.
      h. W. R. Meadows, Inc; Liqui-Hard Ultra: www.wrmeadows.com/#sle.
      i. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.03 COATINGS

A. Clear Coatings: Clear coating recommended by manufacturer for finishing concrete floors and slabs.
   1. Gloss: Semi Gloss.
   2. Type: High solids polyurethane.
      a. Products:
         1) PPG; Flooring 2550 WB Urethane Top Coat: www.ppgmc.com

2) Substitutions: See Section 01 60 00 - Product Requirements.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

### 3.02 GENERAL

A. Apply materials in accordance with manufacturer's instructions.

### 3.03 COATING APPLICATION

A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.

B. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

C. Apply coatings in accordance with manufacturer's instructions, matching approved mock-ups for color, special effects, sealing and workmanship.

**END OF SECTION 03 35 11**

**SECTION 04 20 00**
**UNIT MASONRY**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Concrete block.

B. Concrete building brick.

C. Mortar and grout.

D. Reinforcement and anchorage.

E. Flashings.

F. Accessories.

### 1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

### 1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.

D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

F. ASTM C55 - Standard Specification for Concrete Building Brick; 2023.

G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.

H. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.

I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

K. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

L. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength; 2022.

M. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2023b.

N. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.

O. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).

P. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2019).

Q. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2020.

R. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

S. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.

T. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

### 1.05 QUALITY ASSURANCE

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

## PART 2 PRODUCTS

### 2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
   2. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
   3. Nonloadbearing Units: ASTM C129.
      a. Hollow block, as indicated.
      b. Lightweight.
   4. Units with Integral Water Repellent: Concrete block units as specified in this section with polymeric liquid admixture added to concrete masonry units at time of manufacture.
      a. Performance of Units with Integral Water Repellent:
         1) Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours.
            (a) No water visible on back of wall above flashing at the end of 24 hours.
            (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour (0.05 L per hour) at the end of 24 hours.
            (c) No more than 25 percent of wall area above flashing visibly damp at end of test.
         2) Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
         3) Compressive Strength: ASTM C1314; maximum 5 percent decrease.
      b. Use only in combination with mortar that also has integral water repellent admixture.
      c. Use water repellent admixtures for masonry units and mortar by a single manufacturer.
      d. Exposed Faces, Color and Texture: As selected by Architect from manufacturer's standard range.
      e. Manufacturers:
         1) Echelon, an Oldcastle brand: www.echelonmasonry.com/#sle.
         2) Substitutions: See Section 01 60 00 - Product Requirements.

B. Concrete Brick:
   1. Size: As indicated on drawings.
   2. Concrete Building Brick: ASTM C55; lightweight, solid, for interior or concealed use.

### 2.02 MORTAR AND GROUT MATERIALS

A. Water: Clean and potable.

B. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

C. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the

specified strength in accordance with ASTM C270 with the addition of water only.
1. Color: Standard gray.

D. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar in accordance with ASTM C270 with the addition of water only.
1. Color: Mineral pigments added as required to produce approved color sample.
2. Manufacturers:
a. TCC Materials, SpecMix: www.specmix.com.
b. Substitutions: See Section 01 60 00 - Product Requirements.

E. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
1. Type: Fine.

## 2.03 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
1. 3GEN Masonry Products: www.3genmp.com.
2. Blok-Lok Limited: www.blok-lok.com/#sle.
3. FERO Corporation: www.ferocorp.com/#sle.
4. Hohmann & Barnard, Inc; X-Seal Anchor: www.h-b.com/#sle.
5. TruFast Walls, a division of Altenloh, Brinck & Co. US, Inc: www.trufastwalls.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa), deformed billet bars; galvanized.

C. Single Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss or ladder.
2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

D. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
1. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M Class B.
2. Vertical adjustment: Not more than 1 1/4 inches (32 mm).

E. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).

F. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

## 2.04 FLASHINGS

A. Metal Flashing Materials:
1. Prefabricated Metal Flashing: Smooth fabricated 12 oz/sq ft (3.66 kg/sq m) copper flashing for surface mounted conditions.
a. Manufacturers:
1) Cheney Flashing Company: www.cheneyflashing.com/#sle.
2) Hohmann & Barnard, Inc: www.h-b.com/#sle.
3) Substitutions: See Section 01 60 00 - Product Requirements.

B. Combination Nonasphaltic Flashing Materials - Copper:
   1. Copper/Polymer Film or Fabric Flashing: 5 oz/sq ft (1.52 kg/sq m) copper sheet laminated between two sheets of polyethylene film. Minimum Puncture Resistance of 780 psi (5.38 MPa), when measured in accordance with ASTM E154/E154M.
      a. Manufacturers:
      b. Hohmann & Barnard, Inc; Copper-Fabric NA: www.h-b.com/#sle.
      c. STS Coatings, Inc: www.stscoatings.com/#sle.
      d. WIRE-BOND: www.wirebond.com/#sle.
      e. York Manufacturing, Inc: www.yorkmfg.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Copper/Polymer Fabric Drainage Plane Flashing System: 5 oz/sq ft (1.52 kg/sq m) copper sheet bonded with rubber-based adhesive between one sheet of polymer fabric and one sheet of non-woven drainage material.
      a. Manufacturers:
         1) STS Coatings, Inc: www.stscoatings.com/#sle.
         2) York Manufacturing, Inc; Flash-Vent: www.yorkmfg.com/#sle.

C. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

D. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.

E. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

**2.05 ACCESSORIES**

A. Preformed Control Joints: Polyvinyl chloride material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited: www.blok-lok.com/#sle.
      b. Hohmann & Barnard, Inc; VS series: www.h-b.com/#sle.
      c. WIRE-BOND: www.wirebond.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Full-Height Airspace Maintenance and Drainage Material: Mesh panels fitted between masonry ties.
      a. Drainage Material Thickness: 3/8 inch (9.5 mm).
      b. Manufacturers:
         1) Advanced Building Products, Inc; Mortairvent-CW: www.advancedbuildingproducts.com/#sle.
         2) CavClear, a Division of Archovations Inc; CavClear Masonry Mat: www.cavclear.com/#sle.
         3) Substitutions: See Section 01 60 00 - Product Requirements.

C. Building Paper: ASTM D226/D226M, Type I ("No.15") asphalt felt.

D. Weeps:
   1. Type: Polyester mesh.
   2. Color(s): As selected by Architect from manufacturer's full range.
   3. Manufacturers:
      a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
      b. Blok-Lok Limited: www.blok-lok.com/#sle.
      c. Masonry Technology, Inc; Cavity Weep: www.mtidry.com/#sle.

d. Mortar Net Solutions; WeepVent: www.mortarnet.com/#sle.

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

## 2.06 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Masonry below grade and in contact with earth: Type M or Type S.
   2. Exterior, loadbearing masonry: Type S or Type N.
   3. Exterior, non-loadbearing masonry: Type S or Type N.
   4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
   5. Interior, loadbearing masonry: Type N.
   6. Interior, non-loadbearing masonry: Type N or Type O.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi .
   3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C143/C143M.

D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

# PART 3 EXECUTION

## 3.01 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

## 3.02 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: As indicated for different locations.

## 3.03 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Remove excess mortar and mortar smears as work progresses.

D. Interlock intersections and external corners, except for units laid in stack bond.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

H. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

### 3.04 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches (600 mm) on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

### 3.05 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

### 3.06 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches (400 mm) on center vertically and 24 inches (600 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

### 3.07 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches (152 mm), minimum, into adjacent masonry or turn up flashing ends at least 1 inch (25.4 mm), minimum, to form watertight pan at nonmasonry construction.

B. Terminate flashing up 8 inches (203 mm) minimum on vertical surface of backing:

C. Extend metal flashings to within 1/2 inch (12 mm) of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

### 3.08 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
   1. Openings to 42 inches (1070 mm): Place two, No. 3 (M9) reinforcing bars 1 inch (25 mm) from bottom web.
   2. Openings from 42 inches (1070 mm) to 78 inches (1980 mm): Place two, No. 5 (M16) reinforcing bars 1 inch (25 mm) from bottom web.
   3. Openings over 78 inches (1980 mm): Reinforce openings as detailed.
   4. Place and consolidate grout fill without displacing reinforcing.
   5. Allow masonry lintels to attain specified strength before removing temporary supports.

### 3.09 GROUTED COMPONENTS

A. Lap splices minimum 24 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

### 3.10 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

### 3.11 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

### 3.12 CUTTING AND FITTING

### 3.13 PARGING

### 3.14 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

**END OF SECTION 04 20 00**

**SECTION 04 73 00**
**MANUFACTURED STONE MASONRY**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Adhered manufactured stone masonry veneer (AMSMV).

B. Installation materials.

C. Accessories.

### 1.02 RELATED REQUIREMENTS

A. Section 04 05 11 - Masonry Mortaring and Grouting: Site-mixed mortars.

### 1.03 REFERENCE STANDARDS

A. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.

B. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2023.

C. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

D. ASTM C847 - Standard Specification for Metal Lath; 2018.

E. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2023a.

F. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering; 2006 (Reapproved 2019).

G. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2023.

H. ASTM C1670/C1670M - Standard Specification for Adhered Manufactured Stone Masonry Veneer Units; 2021b.

I. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.

J. ASTM C1780 - Standard Practice for Installation Methods for Cement-Cased Adhered Masonry Veneer; 2020.

K. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

M. ASTM E2556/E2556M - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment; 2010 (Reapproved 2016).

N. ICC-ES AC51 - Acceptance Criteria for Adhered Manufactured Stone Masonry Veneer; 2018, with Editorial Revision (2021).

O. NCMA (AMSV) - Installation Guide and Detailing Options for Compliance with ASTM C1780 for Adhered Manufactured Stone Veneer; Current Edition, Including All Revisions.

P. NCMA TEK 20-01 - Key Installation Checkpoints for Manufactured Stone Veneer; 2014.

Q. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for AMSMV units, lightweight synthetic stone veneer, mortar, lath, rainscreen drainage material, and water-resistive barrier, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Color charts.
   4. Installation methods.

C. Shop Drawings: Submit detail drawings depicting proper installation and flashing techniques. Coordinate locations with those found on drawings.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Samples: Submit four samples of AMSMV units to illustrate color, texture, and extremes of color range.

F. Manufacturer's Certificate: Certify that AMSMV units and mortar meet or exceed specified requirements.

G. Manufacturer's Qualification Statement.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.06 QUALITY ASSURANCE**

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified, with at least five years of documented experience.

**1.07 MOCK-UPS**

A. Construct mock-up panel 8 feet (2.4 m) long by 6 feet (1.8 m) high; include AMSMV, lightweight synthetic stone veneer, mortar, accessories, substrate, and representative wall openings.

B. Locate where directed.

C. Mock-up may remain as part of the work.

**1.08 DELIVERY, STORAGE, AND HANDLING**

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Prevent mechanical damage and contamination by other materials.

C. Protect products from precipitation combined with freezing temperatures. Do not install products with visible frozen moisture.

D. Protect Portland cement based materials from moisture and humidity. Store under cover off the ground in a dry location.

**1.09 FIELD CONDITIONS**

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

**1.10 WARRANTY**

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Provide 50 year manufacturer warranty for AMSMV.

D. Provide 15 year manufacturer warranty for mortar and other installation materials used in exterior installations over steel or wood framing.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Adhered Manufactured Stone Masonry Veneer (AMSMV):
   1. Any current producer member of the Masonry Veneer Manufacturers Association.
   2. Basis of Design: Echelon, an Oldcastle brand; Cordova Stone: www.echelonmasonry.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 ADHERED MANUFACTURED STONE MASONRY VENEER (AMSMV)

A. AMSMV: Cast masonry units using a mixture of cement, lightweight aggregates, concrete additives and color pigments to replicate appearance of natural stone and designed to be applied with a cementitious mortar to a backing surface, complying with ASTM C1670/C1670M and ICC-ES AC51.
   1. Style: As indicated on drawings.
   2. Color, Texture, Range, Special Shapes: As indicated on drawings.

B. AMSMV Trim: Provide hearth stones, wall caps, drip ledges, keystones, quoins, and corner stones.

### 2.03 MORTAR APPLICATIONS

A. At Contractor's option, mortar may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

B. Dash Bond Coat: One part Portland cement, with maximum two parts sand.

C. Scratch Coat Mortars: Scratch coat mortars for application directly to metal lath.
   1. Site-Mixed: ASTM C270, Type N or Type S, using the Proportion Method as specified in Section 04 05 11.
   2. Prepackaged/Preblended: ASTM C1714/C1714M, Type N or Type S.

D. Setting Bed Mortars: Setting bed used to adhere AMSMV units to scratch coat mortar or to bondable concrete or concrete masonry.
   1. Site-Mixed: ASTM C270, Type S, using the Proportion Method as specified in Section 04 05 11.
   2. Prepackaged/Preblended: ASTM C1714/C1714M, Type S.
   3. Prepackaged/Preblended Latex Modified: ANSI A118.4 or ANSI A118.15.

E. Pointing Mortars: Pointing or grouting mortars used to fill the joints between individual AMSMV units once the setting bed mortar has sufficiently cured.
   1. Site-Mixed: ASTM C270, Type N or Type S, using the Proportion Method as specified in Section 04 05 11.
   2. Prepackaged/Preblended: ASTM C1714/C1714M, Type N or Type S.

### 2.04 ACCESSORIES

A. Metal Lath with Rainscreen Drainage Material: Factory-assembled combination of mesh drainage material and metal lath.
   1. Diamond Mesh Metal Lath: ASTM C847, galvanized, self-furring.
   2. Rainscreen Drainage Mesh: 90 percent open non-woven polyester mesh.
      a. Thickness: 1/4 inch (6 mm).
      b. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
   3. Manufacturers:
      a. Mortar Net Solutions; LathNet: www.mortarnet.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Water-Resistive Barrier: ASTM D226/D226M or ASTM E2556/E2556M.

C. Bonding Compound: Provide type recommended for bonding scratch coat to solid surfaces, complying with ASTM C932.

D. Rainscreen Drainage Material:

E. Cleaning Solution: Non-acidic, not harmful to AMSMV work or adjacent materials, approved by AMSMV manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that backup wall system construction complies with AMSMV manufacturer's instructions, NCMA (AMSV), NCMA TEK 20-01, ASTM C1780 and ICC-ES AC51.

B. Verify that substrates to receive mortar scratch coat or setting bed comply with AMSMV manufacturer's instructions, NCMA (AMSV), NCMA TEK 20-01, ASTM C1780 and ICC-ES AC51:

1. Concrete Masonry: Verify joints are cut flush and surface is ready to receive mortar setting bed. Verify no bituminous or water repellent coatings exist on masonry surface.
2. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

C. Verify that related items provided under other sections are properly sized and located.

D. Verify that built-in items are in proper location, and ready for installation of AMSMV.

### 3.02 INSTALLATION - RAINSCREEN DRAINAGE MATERIAL

A. Install rainscreen drainage material and metal lath with accessories over sheathing material and water-resistive barrier with fastening system in accordance with ASTM C1063 into wood or metal studs. Install drainage material with filter fabric mortar screen to exterior.

B. Install metal lath with rainscreen drainage material in accordance with the manufacturer's instructions.

### 3.03 INSTALLATION - SCRATCH COAT

A. Apply mortar scratch coat of 1/2 inch (12.5 mm) nominal to cover metal lath in accordance with ASTM C926. Scratch surface when somewhat firm. If scratch coat dries before applying setting bed mortar and AMSMV, moisten scratch coat by misting it with water.

### 3.04 INSTALLATION - AMSMV

A. Install AMSMV with a cementitious mortar setting bed to a scratch coat backing surface, in accordance with AMSMV manufacturer's instructions, NCMA (AMSV), NCMA TEK 20-01, ASTM C1780 and ICC-ES AC51.

B. Mortar Joints: Concave.

C. Windows, Doors and Wall Openings: Butt AMSMV units to wall opening.

D. Sills: Install sills where located on drawings.

E. Caps: Install capstones where located on drawings.

F. Seal all joints at wall openings and penetrations with sealant approved for use with AMSMV.

### 3.05 INSTALLATION - MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

B. Extend metal flashings through exterior face of AMSMV and terminate in an angled drip with hemmed edge.

C. Lap end joints of flashings at least 6 inches (152 mm), minimum, and seal watertight with flashing sealant/adhesive.

### 3.06 TOLERANCES

A. Maximum Variation from Unit to Adjacent Unit: 1/16 inch (1.6 mm).

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet (6 mm in 3 m) and 1/2 inch in 20 feet (13 mm in 6 m) or more.

C. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 feet (3 mm in 1 m) and 1/4 inch in 10 feet (6 mm in 3 m); 1/2 inch in 30 feet (13 mm in 9 m).

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet (3 mm in 1 m).

**3.07 CLEANING**

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean AMSMV in accordance with manufacturer's installation instructions.

D. Clean soiled surfaces with cleaning solution.

E. Use non-metallic tools in cleaning operations.

**3.08 PROTECTION**

A. Protect finished work from rain during and for 48 hours following installation.

B. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

**END OF SECTION 04 73 00**

**SECTION 05 12 00**
**STRUCTURAL STEEL FRAMING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Structural steel framing members.

B. Structural steel support members and struts.

C. Grouting under base plates.

### 1.02 RELATED REQUIREMENTS

A. Section 05 21 00 - Steel Joist Framing.

B. Section 05 31 00 - Steel Decking: Support framing for small openings in deck.

C. Section 07 81 00 - Applied Fire Protection: Fireproof protection to framing and metal deck systems.

### 1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; 2023.

B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.

C. AISC 325 - Steel Construction Manual; 2023.

D. AISC 341 - Seismic Provisions for Structural Steel Buildings; 2022.

E. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2023).

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

H. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.

I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

K. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

L. ASTM A436 - Standard Specification for Austenitic Gray Iron Castings; 1984 (Reapproved 2020).

M. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

N. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2021a.

O. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.

P. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

Q. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.

R. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2023.

S. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film; 2017.

T. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.

U. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2023.

V. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.

W. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.

X. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.

Y. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.

Z. 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; 2023.

AA. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

BB. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

CC. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

DD. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

EE. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.

FF. SSPC-PA 1 - Shop, Field, and Maintenance Coating of Metals; 2024.

GG. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

HH. SSPC-SP 2 - Hand Tool Cleaning; 2024.

II. SSPC-SP 3 - Power Tool Cleaning; 2024.

JJ. UL (FRD) - Fire Resistance Directory; Current Edition.

## 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show fabrication of structural-steel components.
   1. Include details of cuts, connections, splices, camber, 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. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
   4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
   5. Identify members and connections of the seismic-load-resisting system.
   6. Indicate locations and dimensions of protected zones.
   7. Identify demand critical welds.
   8. Connection calculations to be sealed by a professional engineer licensed in the project location.
   9. Connections: Provide shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design performed by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.
      a. Select and complete connections using schematic details indicated and AISC 360.
      b. Use LRFD.

10. Connection calculations are to be sealed by a professional engineer licensed in the project location.
11. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
12. Connections not detailed.
13. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

**1.05 QUALITY ASSURANCE**

A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

B. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

C. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

D. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1, P2, P3 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."
1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

F. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
2. AISC 341 and AISC 341s1.
3. AISC 360.
4. RCSC (HSBOLT) "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

**1.06 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 corrosion and deterioration.
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. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and re-lubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

**1.07 COORDINATION**

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of 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 REGULATORY REQUIREMENTS

A. Comply with UL (FRD) Assembly Design As indicated on architectural drawings

### 2.02 MATERIALS

A. Steel Angles and Plates: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Rolled Steel Structural Shapes: ASTM A992/A992M.

D. Plate and Bar: ASTM A36/A36M.

E. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

F. Pipe: ASTM A53/A53M, Type E or S, Grade B, Finish black and galvanized, as indicated.
   1. Weight Class: Standard.

G. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

H. Unheaded Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563/A563M nuts and ASTM F436/F436M Type 1 washers.
   1. Configuration: Straight.
   2. Nuts: ASTM A563 heavy-hex carbon steel.
   3. Plate Washers: ASTM A36/A36M carbon steel.
   4. Washers: ASTM A436 ASTM F 436, Type 1, hardened carbon steel.
   5. Finish: Plain

I. Headed Anchor Rods: ASTM F1554 Grade 36, plain.
   1. Nuts: ASTM A563 heavy-hex carbon steel.
   2. Plate Washers: ASTM A 36 carbon steel.
   3. Washers: ASTM F436/F436M, Type 1, hardened carbon steel.
   4. Finish: Plain
   5. Threaded Rods: ASTM A36/A36M.
   6. Nuts: ASTM A563 heavy hex carbon steel.
   7. Washers: ASTM F436/F436M, Type 1, hardened ASTM A36/A36M carbon steel.
   8. Finish: Plain

J. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.

K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

L. Sliding Bearing Plates: Teflon coated.

M. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).
   3. Height Change, Plastic State; when tested according to ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.

### 2.03 FABRICATION

A. Shop fabricate to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
   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.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

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 2, "Hand Tool Cleaning or SSPC-SP 3, "Power Tool Cleaning."

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Baseplate 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.

**2.04 FINISH**

A. Prepare structural component surfaces in accordance with SSPC-SP 3.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

C. Primer
   1. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI (APSM) #79 and compatible with topcoat.
   2. Galvanizing Repair Paint: MPI (APSM) #18, MPI (APSM) #19, or SSPC-Paint 20 ASTM A780/A780M.

**2.05 SHOP CONNECTIONS**

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM F3125/F3125M Bolts for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

C. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

**2.06 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.
   2. Surfaces to be field welded.
   3. Surfaces to be high-strength bolted with slip-critical connections.
   4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
   5. Galvanized 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 2, "Hand Tool Cleaning."
   2. 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 minimum dry film thickness of 1.5 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 surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Prepare steel and apply a one-coat, non-asphaltic primer complying with SSPC-PS 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.

**2.07 GALVANIZING**

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123/A123M.
   1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
   2. Galvanize lintels attached to structural-steel frame and located in exterior walls.

**2.08 SOURCE QUALITY CONTROL**

A. Welded Connections: Visually inspect all shop-welded connections and test at least ____ percent of welds using one of the following:
   1. Radiographic testing performed in accordance with ASTM E94/E94M.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
   4. Magnetic particle inspection performed in accordance with ASTM E709. performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

B. Verify, with steel Erector present, elevations of concrete and masonry bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
   1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 ERECTION**

A. Erect structural steel in compliance with AISC 303.

B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components and shear studs indicated on shop drawings.

D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

E. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

F. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

G. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

H. Base and bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and 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.

I. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

J. Align and adjust various members that form 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.

K. Splice members only where indicated.

L. Do not use thermal cutting during erection unless approved by Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

M. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

**3.03 TOLERANCES**

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

**3.04 FIELD QUALITY CONTROL**

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
1. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts."

C. Welded Connections: Visually inspect all field-welded connections and test at least 3 percent of welds using one of the following:
1. Radiographic testing performed in accordance with ASTM E94/E94M.
2. Ultrasonic testing performed in accordance with ASTM E164.
3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
4. Magnetic particle inspection performed in accordance with ASTM E709; performed on root pass and on finished welds. Cracks or zones of incomplete fusion or penetration will not be accepted.

**3.05 REPAIRS AND PROTECTION**

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A780/A780M.

B. Touch-up Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C.

**END OF SECTION 05 12 00**

**SECTION 05 21 00**
**STEEL JOIST FRAMING**

## 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 SECTION INCLUDES

A. Open web steel joists , with bridging, attached seats and anchors.

### 1.03 DEFINITIONS

A. SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

### 1.04 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

D. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

E. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.

F. 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; 2023.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

H. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.

I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

J. SSPC-SP 2 - Hand Tool Cleaning; 2024.

K. SSPC-SP 3 - Power Tool Cleaning; 2024.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: For each type of joist, accessory, and product indicated.

C. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, attachments, and layout.
   1. Indicate locations and details of bearing plates to be embedded in other construction.

D. Welding certificates.

E. Manufacturer Certificates: Signed by manufacturers certifying that joists comply with requirements.

F. Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.

G. Qualification Data: For manufacturer.

H. Field quality-control test and inspection reports.

I. Research/Evaluation Reports: For joists.

### 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."

B. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

C. Transport, handle, store, and protect products to SJI requirements.

### 1.08 SEQUENCING

A. Deliver steel bearing plates to be built into masonry construction.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Steel Joists:
   1. Canam Group Inc: www.canam-steeljoists.ws
   2. Nucor-Vulcraft Group: www.vulcraft.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 MATERIALS

A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.

B. Steel Bearing Plates: ASTM A36/A36M.

C. Carbon-Steel Bolts and Threaded Fasteners: ASTM A307, Grade A, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.
   1. Finish: Plain, uncoated

D. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436/F436M hardened carbon-steel washers.
   1. Finish: Plain.

E. Welding Electrodes: Comply with AWS standards.

### 2.03 PRIMERS

1. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

### 2.04 JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.

C. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Hot-dip zinc coat according to ASTM A123/A123M.

D. Steel bearing plates with integral anchorages are specified in Division 05 Section "Metal Fabrications."

E. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished

wall surface, unless otherwise indicated.

F. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

**2.05 CLEANING AND SHOP PAINTING**

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

D. Shop priming of joists and joist accessories is specified in Division 09 painting Sections.

**2.06 MATERIALS**

A. Open Web Joists: SJI Type K Joists:
   1. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
   2. Camber joists according to SJI's "Specifications.".
   3. Provide bottom and top chord extensions as indicated.
   4. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
   5. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
      a. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).
      b. Extend bearing ends of joists with SJI's Type R extended ends where indicated.
   6. Finish: Shop primed.

B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

C. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

**2.07 JOIST ACCESSORIES**

A. Bridging: Provide bridging anchors and number of rows of horizontal o [diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.

C. Bridging: Fabricate as indicated and according to SJI's "Specifications." Furnish additional erection bridging if required for stability.

D. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Hot-dip zinc coat according to ASTM A123/A123M.

E. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface, unless otherwise indicated.

F. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

**2.08 CLEANING AND SHOP PAINTING**

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

D. Shop priming of joists and joist accessories is specified in Division 09 painting Sections..

**2.09 FABRICATION**

A. Drill holes in chords for attachment of wood nailers where indicated.

B. Frame special sized openings in joist web framing as detailed.

**2.10 FINISH**

A. Shop prime joists as specified.

B. Prepare surfaces to be finished in accordance with SSPC-SP 2.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify existing conditions prior to beginning work.

B. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 TOLERANCES**

A. Maximum Variation From Plumb: 1/4 inch (6 mm).

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

**3.03 INSTALLATION**

A. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
   1. Before installation, splice joists delivered to Project site in more than one piece.
   2. Space, adjust, and align joists accurately in location before permanently fastening.
   3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
   4. SJI's "Specifications" cautions that a rigid connection of bottom chord to column be made only after application of dead loads. Revise subparagraph below to suit Project. Add other limitations as required.
   5. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

B. Field weld joists to supporting steel bearing plates. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

C. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

**3.04 FIELD QUALITY CONTROL**

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

B. Field welds will be visually inspected according to AWS D1.1/D1.1M.

C. Bolted connections will be visually inspected.

D. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC (HSBOLT) "Specification for Structural Joints Using ASTM F3125/F3125M A 325 or A 490 Bolts."

E. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

F. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

**3.05 REPAIRS AND PROTECTION**

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

B. Retain paragraph and subparagraphs below if on-site paint repair is included in this Section. Touchup painting may be unnecessary if building is closed in immediately and building in-service conditions require no permanent paint protection.

C. Touchup Painting: After installation, promptly clean, prepare, and prime or re-prime field connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates, abutting structural steel, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning,SSPC-SP 3.
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

D. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

**END OF SECTION 05 21 00**

**SECTION 05 31 00**
**STEEL DECKING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Roof deck.

B. Composite floor deck.

C. Supplementary framing for openings up to and including 18 inches (450 mm).

### 1.02 RELATED REQUIREMENTS

A. Section 05 12 00 - Structural Steel Framing: Support framing for openings larger than 18 inches (450 mm) and shear stud connectors.

### 1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

C. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

D. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; 2022.

E. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements; 2019, with Editorial Revision (2021).

F. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.

G. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

H. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

### 1.05 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Steel Deck:
   1. Canam Steel Corporation: www.canam-steeljoists.ws.
   2. Nucor-Vulcraft Group: www.vulcraft.com/#sle.
   3. Epic Metals Corporation; www.epic metals .com.
   4. New Millennium Building Systems, LLC; www:newmill.com
   5. United Steel Deck, Inc.; www:njb-united.com
   6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
   1. Calculate to structural working stress design and structural properties specified.

B. Roof Deck: Non-composite type, fluted steel sheet:

1. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:
    a. Deck Profile: As indicated.
    b. Profile Depth: As indicated.
    c. Design Uncoated-Steel Thickness: As indicated.
    d. Span Condition: Triple span or more.
    e. Side Laps: Overlapped.
2. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 zinc coating.
3. Minimum Base Metal Thickness: 22 gauge, 0.0299 inch (0.76 mm).
4. Side Joints: Lapped, mechanically fastened.
5. End Joints: Lapped, mechanically fastened.

C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
1. Composite Steel Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 30, with the minimum section properties indicated, and with the following:
    a. Profile Depth: As indicated.
    b. Design Uncoated-Steel Thickness: As Indicated.
2. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 zinc coating.
3. Span Design: Triple or more.

**2.03 ACCESSORY MATERIALS**

A. Welding Materials: AWS D1.1/D1.1M.

B. Fasteners: Galvanized hardened steel, self tapping.

C. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
1. Design Requirements: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.

D. Weld Washers: Mild steel, uncoated, 3/4 inch (19 mm) outside diameter, 1/8 inch (3 mm) thick.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On concrete and masonry surfaces provide minimum 4 inch (100 mm) bearing.

C. On steel supports provide minimum 1-1/2 inch (38 mm) bearing.

D. At mechanically fastened male/female side laps fasten at 24 inches (600 mm) on center maximum.

E. Weld deck in accordance with AWS D1.3/D1.3M.

F. At deck openings from 6 inches (150 mm) to 18 inches (450 mm) in size, provide 2 by 2 by 1/4 inch (50 by 50 by 6 mm) steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.

G. At deck openings greater than 18 inches (450 mm) in size, provide steel angle reinforcement. as specified in Section 05 12 00.

H. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.

I. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

**END OF SECTION 05 31 00**

**SECTION 05 40 00**
**COLD-FORMED METAL FRAMING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Formed steel stud exterior wall framing.

### 1.02 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

E. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members; 2018, with Editorial Revision.

F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

G. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.

C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Design data:
      a. Shop drawings signed and sealed by a professional structural engineer.
   2. Calculations for loadings and stresses of specially fabricated framing, signed and sealed by a professional structural engineer.

E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .

### 1.04 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Metal Framing:
   1. CEMCO : www.cemcosteel.com/#sle.
   2. ClarkDietrich : www.clarkdietrich.com/#sle.
   3. Jaimes Industries : www.jaimesind.com/#sle.
   4. Marino : www.marinoware.com/#sle.
   5. R-stud, LLC : https://www.rstud.com/#sle.
   6. SCAFCO Corporation : www.scafco.com/#sle.

7. Steel Construction Systems : www.steelconsystems.com/#sle.
8. The Steel Network, Inc: www.SteelNetwork.com/#sle.
9. Allied Studco: www.studcosystems.com..
10. AllSteel Products, Inc.: www.allsteelproducts.com.
11. Consolidated Fabricators Corp.; Building Products Division.
12. Craco Metals Manufacturing, LLC.: www.cracometals.
13. Custom Stud, Inc: www.customstudinc.com
14. The Formetal Co. Inc.: www.theformetal.com
15. Quail Run Building Materials, Inc.: www.qrbm.com
16. Steeler, Inc.: www.steeler.com
17. Super Stud Building Products, Inc.: www.buysuperstud.com
18. United Metal Products, Inc.: www.unitedmetalproducts.com.
19. Substitutions: See Section 01 60 00 - Product Requirements.

B. Framing Connectors and Accessories:
1. Same manufacturer as metal framing.

**2.02 FRAMING SYSTEM**

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Design Requirements: Provide completed framing system having the following characteristics:
1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100.
2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
3. Design Loads: In accordance with applicable codes.
4. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
5. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

**2.03 FRAMING MATERIALS**

A. Studs and Track: ASTM C955; studs formed to channel, C- or Sigma-shaped with punched web; U-shaped track in matching nominal width and compatible height.
1. Gauge and Depth: minimum 33 mils (20ga) or unless noted otherwise on drawings.
2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
3. Provide components fabricated from ASTM A1008/A1008M Designation SS (structural steel).

B. Jamb Studs: Engineered, C-shaped with wide flanges, designed to replace conventional double-stud framing at openings.

C. Header: Engineered one-member or two-member assembly, with wide flanges, designed to replace conventional box or nested header framing at openings.
1. Jamb Mounting Clips: Manufacturer's standard.
2. Cripple Stud Clips: Manufacturer's standard.

D. Partition Head to Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.
1. Products:
a. Clark Dietrich: www.clarkdietrich.com
1) 2-1/2" Leg MaxTRAK has 1-1/2" long slots with a total allowable vertical (deflection) movement of 1-1/2" (3/4"±)
2) 3" Leg MaxTRAK has 2" long slots with a total allowable vertical (deflection) movement of 2" (1"±)

b. Substitutions: See Section 01 60 00 - Product Requirements

E. Framing Connectors: Factory-made, formed steel sheet.
1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gauge, 0.1345 inch (3.42 mm), and factory punched holes and slots.
2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100.
3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch (13 mm).
b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch (13 mm).
c. Products:
1) ClarkDietrich; Drift FastClip Slide Clip D-FCSC: www.clarkdietrich.com/#sle.
2) ClarkDietrich; FastClip Slide Clip FCSC: www.clarkdietrich.com/#sle.
3) Simpson Strong Tie; Deflection and Drift Connectors: www.strongtie.com/#sle.
4) Super Stud Building Products, Inc; Deflection Clips: www.buysuperstud.com/#sle.
5) Substitutions: See Section 01 60 00 - Product Requirements.
4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
5. Wall Stud Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connections where indicated on the drawings.
a. Products:
1) ClarkDietrich; Spazzer 5400 Bridging Bar: www.clarkdietrich.com/#sle.
2) ClarkDietrich; FastBridge Clip: www.clarkdietrich.com/#sle.
3) Simpson Strong Tie; SBR Structural Spacer Bar: www.strongtie.com/#sle.
4) Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

## 2.05 ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. End clips.
5. Foundation clips.
6. Gusset plates.
7. Stud kickers, knee braces, and girts.
8. Hole reinforcing plates.

9. Backer plates.

C. Sheet Metal Backing: 16g - .059" thick, galvanized.

D. Blocking for ADA accessories, cabinets, wall mounted handrails and where indicated on the drawings: Flush-Mount Backing, 16g - .059 inch thick; 16" stud spacing.
   1. ADA Compliant
      a. Manufacturer: Metal-Lite; www.metal-lite.net.

E. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, or DOD-P-21035 complying with VOC limitations of authorities having jurisdiction.

**2.06 FABRICATION**

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
   1. Fabricate framing assemblies using jigs or templates.
   2. Cut framing members by sawing or shearing; do not torch cut.
   3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
   4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
      a. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
   5. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
      a. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
      b. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that substrate surfaces are ready to receive work.

B. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. Proceed with installation only after unsatisfactory conditions have been corrected

**3.02 INSTALLATION GENERAL**

A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.

B. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

C. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

**3.03 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION**

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: 16 inches

C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Connect vertical deflection clips to bypassing studs and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
   1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
      a. Install solid blocking at centers indicated on Shop Drawings.
   2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

### 3.04 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.05 REPAIRS AND PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

**END OF SECTION 05 40 00**

**SECTION 05 50 00**
**METAL FABRICATIONS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Shop fabricated steel and aluminum items.

B. Downspout boots.

C. Modification to Booking Room Bench.

### 1.02 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

E. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

L. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019a.

M. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

N. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.

O. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings; 2018, with Editorial Revision.

P. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

Q. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

R. 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; 2023.

S. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

T. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

U. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

V. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

W. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

X. SSPC-SP 2 - Hand Tool Cleaning; 2024.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
      a. Include the following, as applicable:
         1) Design criteria.
         2) Engineering analysis depicting stresses and deflections.
         3) Member sizes and gauges.
         4) Details of connections.
         5) Support reactions.
         6) Bracing requirements.

C. Designer's Qualification Statement.

## PART 2 PRODUCTS

### 2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

F. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

### 2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

F. Aluminum-Alloy Die Castings: ASTM B85/B85M.

G. Bolts, Nuts, and Washers: Stainless steel.

H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

## 2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.04 FABRICATED ITEMS

A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
   1. Diameter as indicated on drawings.

B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.

C. Lintels: As detailed; prime paint finish.

D. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.

## 2.05 DOWNSPOUT BOOTS

A. Downspout Boots: Smooth interior without boxed corners or choke points; include integral lug slots and on-body cleanout and cover with neoprene gaskets.
   1. Configuration: Angular.
   2. Material: Cast iron; ASTM A48/A48M; casting thickness 3/8 inch (9.5 mm), minimum.
   3. Finish: Manufacturer's standard factory applied powder coat finish.
   4. Color: To be selected by Architect from manufacturer's standard range.
   5. Accessories: Manufacturer's standard stainless steel fasteners, stainless steel building wall anchors, and rubber coupling.
   6. Manufacturers:
      a. Downspoutboots.com, a division of J. R. Hoe & Sons; ____: www.downspoutboots.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.06 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating. (Provide minimum 530 g/sq m galvanized coating.)

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

G. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

## 2.07 FINISHES - ALUMINUM

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick; light bronze.

C. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.

D. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.

1. Manufacturers:
    a. Sherwin-Williams Company; POLANE Solar Reflective 2K Urethane Enamel: oem.sherwin-williams.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.08 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

# PART 3 EXECUTION

## 3.01 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

## 3.02 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Perform field welding in accordance with AWS D1.1/D1.1M.

D. Obtain approval prior to site cutting or making adjustments not scheduled.

E. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

## 3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

**END OF SECTION 05 50 00**

**SECTION 05 51 00**
**METAL STAIRS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Stairs with concrete treads.

B. Stairs with grating treads.

C. Structural steel stair framing and supports.

D. Handrails and guards.

### 1.02 REFERENCE STANDARDS

A. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2023.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

H. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

I. 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; 2023.

J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

K. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

L. NAAMM AMP 510 - Metal Stairs Manual; 1992.

M. NAAMM MBG 531 - Metal Bar Grating Manual; 2017.

N. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual; 2019.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - 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.

### 1.04 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.

## 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. Structural Design: Provide complete stair and railing assemblies that comply with the applicable local code.
   3. Dimensions: As indicated on drawings.
   4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
   5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
   6. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
   1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
      a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
      b. Welds Exposed to View: Ground smooth and flush.
      c. Mechanical Joints: Butted tight, flush, and hairline.
      d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
      e. Exposed Edges and Corners: Eased to small uniform radius.
      f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.

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 CONCRETE TREADS

A. Jointing and Finish Quality Level: Commercial, as defined above.

B. Risers: Closed.

C. Treads: Metal pan with field-installed concrete fill.
   1. Concrete Depth: 1-1/2 inches (38 mm), minimum.
   2. Tread Pan Material: Steel sheet.
   3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch (1.9 mm) minimum.
   4. Pan Anchorage to Stringers: Continuously welded, from top or bottom.
   5. Concrete Reinforcement: Welded wire mesh.
   6. Concrete Finish: Steel troweled.

D. Risers: Same material and thickness as tread pans.
   1. Nosing Depth: Not more than 1-1/2 inch (38 mm) overhang.
   2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch (12 mm) wide.

E. Stringers: Rolled steel channels.
   1. Stringer Depth: 10 inches (250 mm).
   2. End Closure: Sheet steel of same thickness as risers welded across ends.

F. Railings: Steel pipe railings.

### 2.03 METAL STAIRS WITH GRATING TREADS

A. Jointing and Finish Quality Level: Commercial, as defined above.

B. Risers: Closed.

C. Treads: Steel bar grating.
   1. Grating Type: Welded.
   2. Bearing Bar Depth: 3/4 inch (19 mm), minimum.
   3. Top Surface: Standard.
   4. Nosing: Checkered plate.
   5. Nosing Width: 1-1/4 inch (32 mm), minimum.
   6. Anchorage to Stringers: End plates welded to grating, bolted to stringers.

D. Stringers: Rolled steel channels.
   1. Stringer Depth: 10 inches (250 mm).
   2. End Closure: Sheet steel, 14 gauge, 0.075 inch (1.9 mm) minimum; welded across ends.

E. Railings: Steel pipe railings.

**2.04 HANDRAILS AND GUARDS**

**2.05 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. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.

D. Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.

E. Gratings: Bar gratings that comply with NAAMM MBG 531 or NAAMM MBG 532, whichever applies based on bar sizes.

F. Concrete Reinforcement: Mesh type as detailed, galvanized.

**2.06 ACCESSORIES**

A. Steel Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

B. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

**PART 3 EXECUTION**

**3.01 PREPARATION**

A. When field welding is required, clean and strip primed steel items to bare metal.

**3.02 INSTALLATION**

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.

D. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.

E. Obtain approval prior to site cutting or creating adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

**3.03 TOLERANCES**

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

**END OF SECTION 05 51 00**

**SECTION 05 51 33**
**METAL LADDERS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Prefabricated ladders.

### 1.02 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

B. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.

C. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings; 2018, with Editorial Revision.

D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

E. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019a.

F. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

G. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

## PART 2 PRODUCTS

### 2.01 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B211/B211M, 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

F. Aluminum-Alloy Die Castings: ASTM B85/B85M .

G. Bolts, Nuts, and Washers: Stainless steel.

H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

### 2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.03 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
   3. Finish: Mill finish aluminum.
   4. Manufacturers:
      a. Industrial Ladder & Scaffolding, Inc.: www.anyladder.com/#sle.
      b. O'Keeffe's Inc Model 503A Low Parapet Access Ladder with Platform: www.okeeffes.com/#sle.
      c. Precision Ladders, LLC: www.precisionladders.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Standard mill finish.

## 2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain approval prior to site cutting or making adjustments not scheduled.

## 3.02 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

**END OF SECTION 05 51 33**

**SECTION 06 10 53**
**MISCELLANEOUS ROUGH CARPENTRY**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Roof-mounted curbs.

B. Roofing nailers.

C. Preservative treated wood materials.

D. Fire retardant treated wood materials.

E. Communications and electrical room mounting boards.

F. Concealed wood blocking, nailers, and supports.

G. Miscellaneous wood nailers, furring, and grounds.

### 1.02 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

C. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

D. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).

E. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

G. AWPA U1 - Use Category System: User Specification for Treated Wood; 2024.

H. PS 1 - Structural Plywood; 2023.

I. PS 20 - American Softwood Lumber Standard; 2021.

J. SPIB (GR) - Standard Grading Rules; 2021.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

## PART 2 PRODUCTS

### 2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.

2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

**2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS**

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing for sizes 2 by 2 through 2 by 6 (50 by 50 mm through 50 by 150 mm):
1. Species: Allowed under referenced grading rules.
2. Grade: No.2.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S4S, No.2 or Standard Grade.
2. Boards: Standard or No.3.

F. Parapet Caps: 1-1/2 inch (38 mm) thick, laminated strand lumber.
1. Comply with AWPA U1 use category 2.

**2.03 CONSTRUCTION PANELS**

A. Communications and Electrical Room Mounting Boards: PS 1, A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Other Applications:
1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

**2.04 ACCESSORIES**

A. Fasteners and Anchors:
1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
1. For contact with preservative treated wood in exposed locations, provide minimum G185 (Z550) galvanizing complying with ASTM A653/A653M.

C. Sill Gasket on Top of Foundation Wall: 1/4 inch (6 mm) thick, plate width, closed cell plastic foam from continuous rolls.

D. Construction Adhesives: Adhesives complying with ASTM C557 or ASTM D3498.

**2.05 FACTORY WOOD TREATMENT**

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:

1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
    a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    b. Do not use treated wood in direct contact with ground.
2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature, low hygroscopic type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
    a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    b. Treat rough carpentry items as indicated.
    c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Install sill gasket under sill plate bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

### 3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

### 3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

### 3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

### 3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on center on edges and into studs in field of board.
    1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
    2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
    3. Install adjacent boards without gaps.

### 3.06 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
    1. Comply with applicable regulations.
    2. Do not burn scrap on project site.

3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION 06 10 53**

**SECTION 06 41 00**
**ARCHITECTURAL WOOD CASEWORK**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Hardware.

### 1.02 RELATED REQUIREMENTS

A. Section 12 36 00 - Countertops.

### 1.03 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

E. BHMA A156.9 - Cabinet Hardware; 2020.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot (125 mm to 1 m), minimum.
   2. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

### 1.05 QUALITY ASSURANCE

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

### 1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

## PART 2 PRODUCTS

### 2.01 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Breakroom Cabinets: Plastic laminate faced, Custom grade.

### 2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

### 2.03 PANEL CORE MATERIALS

A. Medium Density Fiberboard (MDF): Composite panel composed of cellulosic fibers, additives, and bonding system; cured under heat and pressure; comply with ANSI A208.2.

B. Basic Hardboard: Panel manufactured from inter-felted lignocellulosic fibers consolidated under heat and pressure; comply with ANSI A135.4.

## 2.04 THERMALLY FUSED LAMINATE PANELS

A. Thermally Fused Laminate (TFL): Melamine- or polyester-resin-saturated decorative papers; for fusion to composite wood substrates under heat and pressure.
   1. Test in accordance with NEMA LD 3 Section 3.
   2. Color: White.

## 2.05 LAMINATE MATERIALS

A. Manufacturers:
   1. Arborite: www.arborite.com/#sle.
   2. Formica Corporation: www.formica.com/#sle.
   3. Panolam Industries International, Inc: www.panolam.com/#sle.
   4. Basis of Design: Wilsonart LLC: www.wilsonart.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as indicated.

## 2.06 COUNTERTOPS

A. Countertops: See Section 12 36 00.

## 2.07 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Fasteners: Size and type to suit application.

C. Concealed Joint Fasteners: Threaded steel.

D. Grommets: Standard plastic or rubber grommets for cut-outs, in color to match adjacent surface.

## 2.08 HARDWARE

A. Cabinet Hardware: Comply with BHMA A156.9 for hardware types and grades indicated below:
   1. Hardware Types: As indicated on drawings.
   2. Product Grade: Grade 2.

B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

C. Countertop Support Brackets: Fixed, L-shaped, face-of-stud mounting.
   1. Materials: Steel; T-shape cross-section.
      a. Finish: Manufacturer's standard, factory-applied, powder coat.
      b. Color: Black.
      c. Height: as recommended by manufacturer.
      d. Support Length: 9 inches (230 mm).
      e. Width: 1 inch (25 mm).
   2. Products:
      a. Centerline Brackets; Front Mounting Plus Countertop Support: www.countertopbracket.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Vanity Brackets: Fixed, ADA-compliant, face-of-stud mounting.
   1. Material and Shape: Steel; formed compound shapes.
      a. Finish: Manufacturer's standard, factory-applied, textured powder coat.
      b. Color: Black.

2. Products:
    a. A&M Hardware, Inc; ADA Vanity Brackets: www.aandmhardware.com/#sle.
    b. Rakks/Rangine Corporation; ADA Compliant EHV Vanity Supports: www.rakks.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

E. Countertop Brackets; L-shaped, top of knee wall mounting.
1. Materials: Steel plates.
2. Finish: Manufacturer's standard, factory-applied, powder coat.
3. Color: Black.
4. Products:
    a. Centerline Brackets; Standard Plus Countertop Support Bracket: www.countertopbracket.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

F. Countertop Brackets: Fixed, concealed vertical leg, side-of-stud mounting.
1. Materials: Steel L- and T-shapes.
    a. Finish: Manufacturer's standard, factory-applied, powder coat.
    b. Color: Black.
2. Products:
    a. Centerline Brackets; Floating Wall Mount: www.countertopbracket.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Drawer and Door Pulls: 'U' shaped wire pull, satin nickel finish 4" center x 5/16" diameter.

H. Cabinet Catches and Latches:
1. Manufacturers:
    a. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
2. Substitutions: See Section 01 60 00 - Product Requirements.

I. Drawer Slides:
1. Type: Full extension.
2. Static Load Capacity: Heavy Duty grade.
3. Mounting: Side mounted.
4. Stops: Integral type.
5. Manufacturers:
    a. Accuride International, Inc; 9301E Heavy-Duty Full-Extension Slides: www.accuride.com/#sle.
    b. Knape & Vogt Manufacturing Company; Heavy-Duty Drawer Slides: www.knapeandvogt.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

J. Soft-Close, Door and Drawer Adjustable Dampers:
1. Manufacturers:
    a. Titus Cabinet Hardware; Titusoft Dampers for Drawers: www.titusplus.com/us/en/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

K. Hinges: European style concealed self-closing type, steel with nickel-plated finish.
1. Manufacturers:
    a. Blum, Inc; CLIP top BLUMOTION: www.blum.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

L. Sliding Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with nylon rollers.

## 2.09 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises.

1. Cap exposed plastic laminate finish edges with material of same finish and pattern.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.

### 3.02 ADJUSTING

A. Adjust moving or operating parts to function smoothly and correctly.

### 3.03 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION 06 41 00**

## SECTION 07 05 43
## CLADDING SUPPORT SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Cladding support systems, directly attached to substrates.

### 1.02 RELATED REQUIREMENTS

A. Section 070543 - Cladding Support System.

B. Section 07 21 00 - Thermal Insulation.

C. Section 07 42 13.23 - Metal Composite Material Wall Panels.

### 1.03 DEFINITIONS

A. Continuous Insulation: As defined by ASHRAE Std 90.1 I-P.

### 1.04 REFERENCE STANDARDS

A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate cladding support system manufacturer's requirements with requirements of exterior structural wall assemblies.

### 1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's published descriptive data, including product attributes.
   1. Include data for cladding support system.

C. Shop Drawings: For each cladding support system; indicate:
   1. Sections: Include column centers, elevations, and dimensions; indicate locations of system components, component spacings, and wall fasteners.
      a. Drawing Scale: 1/8 inch to 1 foot (1:100), minimum.
   2. Details: Connection details between cladding support systems and substrates; indicate fastener size and spacing.
      a. Drawing Scale: 1-1/2 inches to 1 foot (1:10), minimum.

D. Samples:
   1. Rails Per Type: Two units, 12 inches (300 mm) long.
   2. Clips Per Type: Two units.

E. Delegated Design Documents: Submit for information, signed and sealed documents by structural engineer of record responsible for comprehensive design package of cladding system, including wall fasteners and anchors. Submit structural design, rail spacing, and calculations sufficient to comply with structural design criteria of this section.

F. Design Data: Submit for information, project-specific thermal performance values for above-grade walls; prepared by professional engineer; substantiate values based on alternative compliance methods described in ASHRAE Std 90.1 I-P and acceptable by AHJ.

G. Manufacturer's Instructions: Submit manufacturer's written installation instructions.

H. Designer's qualification statement.

I. Specimen warranty.

### 1.07 QUALITY ASSURANCE

A. Designer Qualifications for Contractor's Design-Related Professional Design Services: Qualified professional structural engineer experienced in design of cladding support systems and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.

### 1.08 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver products to project site in wrapped, protected, unbroken packaging with product identification labeling.

C. Store products under cover and elevated above grade.

D. Handle products without damaging; prevent bending, warping, and twisting to surfaces, edges, or corners.

### 1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty against structural failure of cladding support system. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Provide 2-year warranty against installation defects commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

### 2.02 DESIGN CRITERIA

A. See Section 01 40 00 - Quality Requirements for additional information.

**END OF SECTION 07 05 43**

## SECTION 07 05 53
## FIRE AND SMOKE ASSEMBLY IDENTIFICATION

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Identification markings for fire and smoke rated partitions, and fire rated walls.

### 1.02 REFERENCE STANDARDS

A. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.

C. Schedule: Completely define scope of proposed marking, and indicate location of affected walls and partitions, and number of markings.

D. Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

### 1.04 FIELD CONDITIONS

A. Do not install adhered markings when ambient temperature is lower than recommended by label or sign manufacturer.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Partition Identification Labels:
   1. Fire Wall Signs, Inc: www.firewallsigns.com/#sle.
   2. Safety Supply Warehouse, Inc: www.safetysupplywarehouse.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).

B. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl or paper sign with factory applied adhesive backing.

C. Languages: Provide sign markings in English.

### PART 3 EXECUTION

### 3.01 INSTALLATION

A. Locate markings as required by ICC (IBC).

B. Install adhered markings in accordance with manufacturer's instructions.

C. Install neatly, with horizontal edges level.

D. Protect from damage until Date of Substantial Completion; repair or replace damaged markings.

**END OF SECTION 07 05 53**

**SECTION 07 11 13**
**BITUMINOUS DAMPPROOFING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Bituminous dampproofing.

### 1.02 RELATED REQUIREMENTS

A. Section 07 21 00 - Thermal Insulation: Rigid insulation board used as protection board.

B. Section 31 23 23 - Fill.

C. Section 33 41 00 - Subdrainage.

### 1.03 REFERENCE STANDARDS

A. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011 (Reapproved 2023).

B. ASTM D1227/D1227M - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013, with Editorial Revision (2019).

C. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2018).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide properties of primer, bitumen, and mastics.

C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

### 1.05 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application until dampproofing has cured.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Karnak Corporation: www.karnakcorp.com/#sle.

B. Mar-flex Waterproofing & Building Products: www.mar-flex.com/#sle.

C. W. R. Meadows, Inc: www.wrmeadows.com/#sle.

D. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 BITUMINOUS DAMPPROOFING

A. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition: ASTM D4479/D4479M Type I, asbestos free.
   2. VOC Content: Not more than permitted by local, State, and federal regulations.
   3. Applied Thickness: 1/16 inch (1.5 mm), minimum, wet film.

B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

### 2.03 BITUMEN MATERIALS

A. Cold Asphaltic Type:
   1. Emulsified Asphalt: ASTM D1227/D1227M, with fiber reinforcement other than asbestos, Type II, Class 1 or 2.
   2. Asphalt Primer: ASTM D41/D41M, compatible with substrate.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

### 3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.

B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

C. Do not apply dampproofing to surfaces unacceptable to manufacturer.

D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

### 3.03 APPLICATION

A. Foundation Walls: Apply two coats of asphalt dampproofing.

B. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

C. Apply bitumen per manufacturer's recommendations.

D. Seal items watertight with mastic, that project through dampproofing surface.

**END OF SECTION 07 11 13**

**SECTION 07 21 00**
**THERMAL INSULATION**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction, perimeter foundation wall, underside of floor slabs, and exterior wall behind exterior cladding wall finish.

B. Batt insulation in exterior wall, ceiling, and roof construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

D. Self adhered transition flashing.

E. Foundation and insulation protection liner.

### 1.02 DEFINITIONS

A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.

1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

### 1.03 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.

C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).

D. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

E. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).

F. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.

G. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2017.

H. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

J. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

**1.05 QUALITY ASSURANCE**

A. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

**1.06 FIELD CONDITIONS**

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

**PART 2 PRODUCTS**

**2.01 APPLICATIONS**

A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.

B. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

C. Insulation in Metal Framed Walls: Mineral wool batt insulation with no vapor retarder.

D. Insulation at Exterior Rain Screen: Mineral wool rigid insulation with black facing.

E. Insulation in Metal Framed Walls requiring sound attenuation: Mineral wool sound control batts.

F. Insulation Above Lay-In Acoustical Ceilings: Batt insulation with no vapor retarder.

G. Insulation over Roof Deck: See section 07 53 23 EPDM Roofing System board.

H. Insulation at Structural Connections: Rigid, high-strength polyurethane.
   1. Structural thermal break.

**2.02 FOAM BOARD INSULATION MATERIALS**

A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
   4. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   5. Type and Water Absorption: Type XII, 0.3 percent by volume, maximum, by total immersion.
   6. Products:
      a. DuPont de Nemours, Inc; Styrofoam Brand Cavitymate Plus: building.dupont.com/#sle.
      b. Kingspan Insulation LLC; GreenGuard GG25-LG XPS Insulation Board: www.kingspan.com/#sle.
      c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.

B. Extruded Polystyrene (XPS) Continuous Insulation (CI) Board: Comply with ASTM C578, and manufactured using carbon black technology.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.6 (0.98), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
   4. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
   5. Board Thickness: as indicated on drawings.
   6. Board Edges: Shiplap, at long edges.

7. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
8. Products:
    a. DuPont de Nemours, Inc; Styrofoam Brand Ultra SL (Shiplap): building.dupont.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cellular Polyurethane Thermal Break Board Insulation: High-strength closed-cell structure board with following characteristics.
1. Board Size: as required by application.
2. Board Thickness: as required by application.
3. Thermal Resistance: R-value (RSI-value) of 3.85 (0.68) per inch, minimum, at 75 degrees F (24 degrees C), minimum, in accordance with ASTM C518 test methods.
4. Apparent Thermal Conductivity: K (Ksi)-value of 0.26 Btu inch/hr sq ft degrees F (0.0375 W/m K), minimum, in accordance with ASTM C518 test methods.
5. Compressive Strength: 210 psi (1.45 MPa), minimum, in accordance with ASTM D1621 test methods.
6. Compressive Modulus: 6,155 psi (42 MPa), minimum, in accordance with ASTM D1621 test methods.
7. Water Absorption: 0.5 percent by volume, maximum.
8. Products:
    a. Armatherm; 500-150 Structural Thermal Break Material: www.armatherm.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.
9.

## 2.03 MINERAL FIBER BOARD INSULATION MATERIALS

A. Mineral Wool Block, Board, or Blanket Thermal Insulation: Complying with ASTM C612 or ASTM C553.
1. Where indicated, provide black, non-woven fiberglass facing on one side; with flame spread index of 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Board Size: as required by wall assembly.
4. Board Thickness: to fill full depth of wall cavity.
5. Thermal Resistance: R-value (RSI-value) of 4.3 (0.76) per inch at 75 degrees F (24 C), minimum, when tested in accordance with ASTM C518.
6. Products:
    a. Johns Manville: www.jm.com/#sle.
    b. ROCKWOOL; CURTAINROCK 40: www.rockwool.com/#sle.
    c. ROCKWOOL; ROCKBOARD 40: www.rockwool.com/#sle.
    d. ROCKWOOL; ROXUL SAFE: www.rockwool.com/#sle.
    e. Thermafiber, Inc; RainBarrier ci Dark: www.thermafiber.com/#sle.
    f. Thermafiber, Inc; Safing: www.thermafiber.com/#sle.
    g. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 MINERAL FIBER BLANKET INSULATION MATERIALS

A. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Products:
    a. Johns Manville; MinWool Sound Attenuation Fire Batts: www.jm.com/#sle.
    b. ROCKWOOL; COMFORTBATT: www.rockwool.com/#sle.
    c. Thermafiber, Inc; SAFB: www.thermafiber.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.05 ACCESSORIES

A. Self-Adhered Transition Flashing: Multipurpose, self-adhered flashing with modified butyl adhesive, polyester fiber top sheet, and polypropylene interlayer.
   1. Application: Primerless adhesion for use as through-wall flashings and wall transitions to roof and below-grade systems.
   2. Thickness: minimum 14 mils, nominal.
   3. Size: 9 inches (229 mm) wide, in rolls 75 feet (23 m) long.
   4. Products:
      a. Basis of Design: GCP Technologies; Vycor® Pro Flashing: www.gcpat.com
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Foundation and Insulation Protection Liner
   1. Fiberglass reinforced plastic (FRP) barrier.
   2. Width: as indicated on drawings.
   3. Thickness: 0.060 inch.
   4. Products:
      a. Nudo Inc.; GroundBreaker: www.nudo.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Mineral Wool Insulation Attachment:
   1. Products:
      a. TruFast Walls, a Division of Altenloh, Brinck & Co. US, Inc; Grip-Lok MW Plate: www.trufastwalls.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

## 3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Extend boards over expansion joints, unbonded to foundation on one side of joint.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

## 3.03 FOUNDATION AND INSULATION LINER INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects, and as follows:

   1. Adhere FRP panels securely to insulation using products that will not damage or dissolve insulation. Use only solvent free adhesives with a track record of durability to exterior conditions.
   2. Adhere FRP panels securely to insulation using products that will not damage or dissolve insulation.
      a. Use only solvent free adhesives with a track record of durability to exterior conditions.
   3. Separate dissimilar materials with bushings, gaskets, grommets, washers or coatings where required to prevent electrolytic corrosion.
   4. Use manufacturer's recommended components and hardware unless otherwise shown.

### 3.04 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

### 3.05 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in interior and demising wall spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

### 3.06 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION 07 21 00**

## SECTION 07 21 19
## FOAMED-IN-PLACE INSULATION

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In masonry cavity walls.

### 1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

C. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

C. Certificates: Certify that products of this section meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

E. Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

F. Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

### 1.04 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.

B. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

### 1.05 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

### 2.02 MATERIALS

A. Foamed-In-Place Insulation: Low-density, flexible, open cell, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Thermal Resistance: R-value (RSI-value) of 4.04 (0.71), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.
   2. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
   3. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
   4. Basis of Design:

a. Gaco Western; GacoProFill 6500R: www.gaco.com/#sle.

5. Substitutions: See Section 01 60 00 - Product Requirements.

**2.03 ACCESSORIES**

A. Primer (if any) and Single Compnenet Plyurethane Foam Sealants and : As required by insulation manufacturer.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify work within construction spaces or crevices is complete before insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

**3.02 APPLICATION**

A. Apply insulation in accordance with manufacturer's instructions.

**END OF SECTION 07 21 19**

**SECTION 07 27 00**
**AIR BARRIERS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Air barriers.

### 1.02 DEFINITIONS

A. Air Barrier: Airtight barrier made of material that is virtually air impermeable but water vapor permeable, both to amount as specified, with sealed seams and sealed joints to adjacent surfaces.

### 1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

B. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

C. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

D. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017, with Editorial Revision (2021).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, and limitations.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

### 1.05 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Evaluated Air Barrier Assemblies; www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

B. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

### 1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

## PART 2 PRODUCTS

### 2.01 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR PERMEABLE)

A. Air Barrier Sheet, Self-Adhered:
   1. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 10 perms (572 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F (23 degrees C).
   3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
   4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.

5. Seam and Perimeter Tape: As recommended by sheet manufacturer.
6. Products:
    a. GCP Applied Technologies; Perm-A-Barrier VPS 30: www.gcpat.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 ACCESSORIES**

A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.

B. Flexible Flashing: Self-adhering or mechanically-attached flashing used for wall penetrations in accordance with ICC-ES AC148 requirements.

C. Thinners and Cleaners: As recommended by material manufacturer.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that surfaces and conditions are ready for work of this section.

B. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.

C. Do not proceed with this work until unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

A. Install materials in accordance with manufacturer's installation instructions.

B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Self-Adhered Sheets:
    1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
    2. Lap sheets shingle fashion to shed water and seal laps airtight.
    3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
    4. Use same material, or other material approved by sheet manufacturer, to seal to adjacent substrates, and as flashing.
    5. At wide joints, provide extra flexible membrane allowing joint movement.

E. Openings and Penetrations in Exterior Air Barriers:
    1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches (125 mm) onto air barrier and at least 6 inches (150 mm) up jambs; mechanically fasten stretched edges.
    2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches (100 mm) wide; do not seal sill flange.
    3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches (230 mm) wide, and covering entire depth of framing.
    4. At head of openings, install flashing under air barrier extending at least 2 inches (50 mm) beyond face of jambs; seal air barrier to flashing.
    5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
    6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

### 3.03 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

**END OF SECTION 07 27 00**

## SECTION 07 42 13
## METAL WALL PANELS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Manufactured metal panels for exterior wall panels, with related flashings and accessory components.

### 1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Wall panel substrate.

B. Section 07 21 00 - Thermal Insulation.

C. Section 07 25 00 - Weather Barriers: Weather barrier under wall panels.

D. Section 07 27 00 - Air Barriers: Air barrier under wall panels.

E. Section 07 92 00 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

### 1.03 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

C. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.

D. AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rainscreen Wall Cladding Systems; 2022.

### 1.04 SUBMITTALS

A. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.

B. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, and methods of anchorage.

C. Samples: Submit two samples of wall panel, 12 inches by 12 inches (305 mm by 305 mm) in size illustrating finish color, sheen, and texture.

D. Manufacturer's qualification statement.

E. Warranty Documentation for Installation of Building Rainscreen Assembly: Submit installer warranty and ensure that forms have been completed in Owner's name and registered with installer.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

## 1.07 FIELD CONDITIONS

A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

## 1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Finish Warranty: Provide 15-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. Metal Wall Panels - Concealed Fasteners:
   1. Basis of Design: Longboard Architectural Products; Panelboard™ System Cladding: www.longboardproducts.com
   2. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 METAL WALL PANEL SYSTEM

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Provide exterior wall panels and Starter track, J-track, inside corners, outside corners, termination sets, compression joints U-reveal sets and all accesserires per manufacturer's shop drawings.
   2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
   3. Design Pressure: In accordance with applicable codes.
   4. Maximum Allowable Deflection of Panel: L/180 for length(L) of span.
   5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
   6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
   7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
   8. Corners: Factory-fabricated in one continuous piece with minimum 2-inch (51 mm) returns.
   9. Provide continuity of air barrier seal at building enclosure elements in accordance with requirements; see Section 07 27 00.

B. Exterior Wall Panels:
   1. Profile: Horizontal; style as indicated.
   2. Side Seams: As indicated on drawings, as per manufacturer's installation instructions.
   3. Material: Extruded aluminum sheet, 1/16 inch (1.57 mm) minimum thickness.
   4. Panel Width: 6 inches (152 mm) x 24' (7315.2mm).
   5. Color: As indicated on drawings.

## 2.03 MATERIALS

A. Extruded Aluminum: AAMA 2605, AAMA 2604, AAMA 509, AAMA 501.1-17.

B. Insulation: Mineral-fiber Rain Barrier Dark type, see Section 07 21 00.
   1. Thickness: as indicated on drawings.
   2. Thermal Resistance: R of 4.3 (RSI of .76) per inch.

## 2.04 FINISHES

A. Exposed Surface Finish: Panel manufacturer's standard powder coated finish coating, top coat over manufacuters' recommended primer.

B. Panel Backside Finish: Panel manufacturer's standard type wash coat.

**2.05 ACCESSORIES**

A. Support for Cladding and Continuous Insulation: Continuous thermal Z-girts; see Section 07 05 43 - Cladding Support System.

B. Concealed Sealants: Non-curing butyl sealant or tape sealant, see Section 07 92 00

C. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that building framing members are ready to receive panels.

B. Verify air barrier, see Section 07 27 00, has been installed over wall panel substrate; see Section 05 40 00.

**3.02 PREPARATION**

A. Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane, and spaced at intervals indicated.

**3.03 INSTALLATION**

A. Install panels on walls and soffits in accordance with manufacturer's instructions.

**END OF SECTION 07 42 13**

**SECTION 07 42 13.23**
**METAL COMPOSITE MATERIAL WALL PANELS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Exterior curtain wall system consisting of formed metal composite material (MCM) sheet, and attachment to rainscreen system.

### 1.02 RELATED REQUIREMENTS

A. Section 07 21 60 - Structural Thermal Break

B. Section 07 05 43 - Cladding Support System

### 1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2023b.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

D. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2023.

E. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2021).

F. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2023.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

H. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

K. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturers' installation instructions and warranty requirements.
   1. Require attendance by the installer and relevant sub-contractors.
   2. Include MCM sheet manufacturer’s representative and wall system manufacturer’s representative to review storage and handling procedures.
   3. Review in detail truck transportation, parking, vertical transportation, schedule, personnel, installation of adjacent materials and substrate.
   4. Review procedures for protection of work and other construction.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data - MCM Sheets: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, and finish, and:
   1. Finish manufacturer's data sheet showing physical and performance characteristics.
   2. Storage and handling requirements and recommendations.
   3. Fabrication instructions and recommendations.
   4. Specimen warranty for finish, as specified herein.

C. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.
   4. Specimen warranty for wall system, as specified herein.

D. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, support clips, exposed fasteners, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate panel numbering system.
   2. Differentiate between shop and field fabrication.
   3. Indicate substrates and adjacent work with which the wall system must be coordinated.
   4. Include large-scale details of anchorages and connecting elements.
   5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches (1:10).
   6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

E. Design Data: Submit structural calculations stamped by design engineer, for Architect's information and project record.

F. Test Report: Submit report of full-size mock-up tests for air infiltration, water penetration, and wind performance.

G. Test Report: Submit test report verifying compliance with NFPA 285 for previously-tested exterior wall assembly.

H. Designer's qualification statement.

I. Testing agency's qualification statement.

J. Maintenance Data: Care of finishes and warranty requirements.

**1.06 QUALITY ASSURANCE**

A. Design Engineer's Qualifications: Design structural supports and anchorages under direct supervision of a Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Testing Agency Qualifications: Independent agency experienced in testing assemblies of the type required for this project and having the necessary facilities for full-size mock-up testing of the type specified.

**1.07 DELIVERY, STORAGE, AND HANDLING**

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy-duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting, and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

1. Store in well-ventilated space out of direct sunlight.
2. Protect from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
3. Store at a slope to ensure positive drainage of accumulated water.
4. Do not store in enclosed space where ambient temperature can exceed 120 degrees F (49 degrees C).
5. Avoid contact with other materials that might cause staining, denting, or other surface damage.

### 1.08 FIELD CONDITIONS

A. Do not install panels when air temperature or relative humidity are outside manufacturer's limits.

### 1.09 WARRANTY

A. Special Warranty: Provide 2-year warranty covering water tightness and integrity of seals of wall panels. Complete forms in Owner's name and register with warrantor.

B. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Metal Composite Material (MCM) Sheet Manufacturers:
1. Basis of Design: ALUCOBOND by 3A Composites USA; ALUCOBOND PLUS: www.alucobondusa.com/#sle.
2. Alcotex, Inc: www.alcotex.com/#sle.
3. ALPOLIC Materials: www.alpolic-americas.com/#sle.
4. ATAS International, Inc: www.atas.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 WALL PANEL SYSTEM

A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage, or failure.
1. Provide structural design by or under direct supervision of a Structural Engineer licensed in the State in which the Project is located.
2. Provide panel jointing and weatherseal using a "wet", sealant-sealed system.
3. Anchor panels to supporting framing without exposed fasteners.

### 2.03 PERFORMANCE REQUIREMENTS

A. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F (minus 29 degrees C) to 180 degrees F (82 degrees C) without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.
1. Wind Performance: Provide system tested in accordance with ASTM E330/E330M without permanent deformation or failures of structural members under the following conditions:
2. Design Wind Pressure: In accordance with local building code.
3. Maximum deflection of perimeter framing member of L/175 normal to plane of the wall; maximum deflection of individual panels of L/60.
4. Maximum anchor deflection in any direction of 1/16 inch (1.6 mm) at connection points of framing members to anchors.

B. Air Leakage: 0.10 cfm/sq ft (0.50 L/sec sq m) maximum leakage when tested at 1.57 psf (75 Pa) pressure difference in accordance with ASTM E283/E283M.

C. Water Penetration: No water penetration under static pressure when tested in accordance with ASTM E331 at a differential of 10 percent of inward acting design load, 6.27 psf (300 Pa) minimum, after 15 minutes.
   1. Water penetration is defined as the appearance of uncontrolled water on the interior face of the wall.
   2. Design to drain leakage and condensation to the exterior face of the wall.

D. Fire Performance: Use test method complying with NFPA 285.

**2.04 PANELS**

A. Panels: 1 inch (25.4 mm) deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
   1. Reinforce corners with riveted aluminum angles.
   2. Provide concealed attachment to supporting structure by adhering attachment members to back of panel; attachment members may also function as stiffeners.
   3. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
   4. Secure members to back face of panels using structural silicone sealant approved by MCM sheet manufacturer.
   5. Fabricate panels under controlled shop conditions.
   6. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
   7. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
      a. Make panel lines, breaks, curves, and angles sharp and true.
      b. Keep plane surfaces free from warp or buckle.
      c. Keep panel surfaces free of scratches or marks caused during fabrication.
   8. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.

**2.05 MATERIALS**

A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a core of extruded thermoplastic material; no foamed insulation material content.
   1. Overall Sheet Thickness: 0.118 inch (3 mm), minimum.
   2. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch (100 N-mm/mm) with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F (21 degrees C).
   3. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   4. Flammability: Self-ignition temperature of 650 degrees F (343 degrees C) or greater when tested in accordance with ASTM D1929.

B. Metal Framing Members: Include sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
   1. Provide material strength, dimensions, configuration as required to meet applied loads and in compliance with applicable building code.
   2. Sheet Steel Components: ASTM A653/A653M galvanized to G90/Z275 or zinc-iron alloy-coated to A60/ZF180; or ASTM A792/A792M aluminum-zinc coated to AZ60/AZM180.
   3. Stainless Steel Sheet Components: ASTM A480/A480M.

**2.06 FINISHES**

A. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent

PVDF resin, with at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss as selected by Architect from manufacturer's standard line.

B. Color/Texture: As selected by Architect from manufacturer's standard range.

## 2.07 ACCESSORIES

A. Fasteners:
   1. Exposed Fasteners: Stainless steel; permitted only where absolutely unavoidable and subject to prior approval of the Architect.
   2. Screws: Self-drilling or self-tapping Type 410 stainless steel or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
   3. Bolts: Stainless steel.
   4. Fasteners for Flashing and Trim: Blind fasteners of high-strength aluminum or stainless steel.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Examine dimensions, tolerances, and interfaces with other work.

B. Examine substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Notify Architect in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

## 3.02 INSTALLATION

A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.

B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.

C. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners.

D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

E. Do not form panels in field unless required by wall system manufacturer and approved by the Architect; comply with MCM sheet manufacturer's instructions and recommendations for field forming.

F. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.

G. Where joints are designed for field-applied sealant, seal joints completely with specified sealant.

H. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
   1. Variation From Plane or Location: 1/2 inch in 30 feet (10 mm in 10 m) of length and up to 3/4 inch in 300 feet (20 mm in 100 m), maximum.
   2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet (3 mm in 9 m) run, maximum.
   3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet (3 mm in 9 m) run, maximum.

4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch (0.75 mm), maximum.

I. Replace damaged products.

**END OF SECTION 07 42 13.23**

## SECTION 07 53 23
## ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING - VERSICO

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Adhered roof system with ethylene-propylene-diene-monomer (EPDM) roofing membrane.

B. Vapor retarder.

C. Deck sheathing.

D. Cover boards.

E. Insulation.

### 1.02 RELATED REQUIREMENTS

A. Section 01 23 00 - Alternates

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings and reglets.

### 1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

C. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.

D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.

E. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).

F. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011 (Reapproved 2019).

G. FM (AG) - FM Approval Guide; Current Edition.

H. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2024).

I. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; 2016, with Editorial Revision (2022).

J. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. Review preparation and installation procedures, in addition to coordination and scheduling required with related work.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's written information listed below.
   1. Product data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, mechanical fastener layout, and walk pad layout.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions provided.

F. Manufacturer's Installation Instructions: Indicate membrane seaming precautions, finish coating installation, special procedures, and perimeter conditions requiring special attention.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Warranty Documentation.
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with required warranty conditions for waterproofing membrane.

### 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with at least twenty years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least five years documented experience.
   1. Approved by membrane manufacturer.

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

### 1.08 FIELD CONDITIONS

A. Do not apply roofing membrane when ambient temperature is below 40 degrees F (5 degrees C) or above manufacturer's recommended ambient temperature.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed that same day.

D. Proceed with work so new roofing materials are not subject to construction traffic as work progresses.

E. Do not allow grease, oils, fats, or other contaminants to come into direct contact with roofing membrane.

### 1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing membrane that leaks or is damaged due to wind or other natural causes.
   1. System Warranty Term: 25 years.
   2. For repair and replacement include costs of both material and labor in warranty.

## PART 2 PRODUCTS

### 2.01 MANUFACTURER

A. Basis of Design: Versico Roofing Systems: www.versico.com/#sle.

B. Carlisle SynTec Systems: www.carlisle-syntec.com/#sle.

C. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 ROOFING APPLICATIONS

A. Ethylene-Propylene-Diene-Monomer (EPDM) Membrane Roofing: Single-ply membrane.
   1. Adhered, over insulation.

## 2.03 PERFORMANCE / DESIGN CRITERIA

A. Solar Reflectance Index (SRI): Minimum of 64 based on three-year aged value; if three-year aged data is not available, minimum of 82 initial value, calculated in accordance with ASTM E1980.
   1. Field applied coating may not be used to achieve specified SRI.

B. Roof Covering External Fire Resistance Classification: Class A when tested in accordance to UL 790.

C. Wind Uplift:
   1. Designed to withstand wind uplift forces calculated in accordance with ASCE 7.
   2. Design Wind Speed: In accordance with local building code and authorities having jurisdiction (AHJ).

D. Insulation Thermal Resistance (R-Value): Provide R-Value over entire roof deck in accordance with local building code requirements.

E. Drainage: No standing water within 48 hours after precipitation.

## 2.04 ROOFING MEMBRANE MATERIALS

A. Single Source Responsibility: Provide and install products from single source.

B. Membrane: Ethylene-propylene-diene-monomer (EPDM); ASTM D4637/D4637M, Type I - Non-Reinforced.
   1. Membrane Thickness: 60 mils, 0.060 inch (1.5 mm), minimum.
   2. Sheet Width: Factory fabricated into largest sheets possible.
   3. Base Bid: Color: Black.
      a. Add Alternate GC4 Color: upcharge to White on Black.
   4. Products:
      a. Versico Roofing Systems; VersiGard Non-Reinforced EPDM.

C. Seaming Materials: As recommended by membrane manufacturer.

D. Vapor Retarder: Material approved by roofing membrane manufacturer and in compliance with fire rating classification requirements, and compatible with roofing and insulation materials.
   1. Provide fire-retardant adhesive.

E. Flexible Flashing Material: Same material as roofing membrane.

F. Base Flashing: Provide waterproof, fully adhered base flashing system at penetrations, plane transitions, and terminations.

## 2.05 DECK SHEATHING

A. Deck Sheathing: Gypsum sheathing, ASTM C1278/C1278M, Type X special fire resistant type, and paper faced.
   1. Thickness: 5/8 inch (15.9 mm), minimum.

## 2.06 COVER BOARDS

A. Cover Board: Extruded polystyrene (XPS) insulation board; ASTM C578, Type IV.
   1. Compressive Strength: 25 psi (172 kPa), minimum.
   2. Board Thickness: 3/4 inch (19 mm).
   3. Board Edge: Square.
   4. Products:
      a. Owens-Corning Foamular 604, distributed by Versico.

## 2.07 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: Complies with ASTM C1289, Type II, Class 1 - Faced with organic felt facers (glass fiber reinforced cellulosic felt) on both major surfaces of core foam.
   1. Tapered Board: Slope as necessary for application, with 1/2 inch (12.7 mm), minimum thickness, and fabricated from fewest possible layers.

2. Grade and Compressive Strength: Grade 2, with 20 psi (138 kPa), minimum.
3. Products:
    a. Versico Roofing Systems; VersiCore MP-H.
    b. Versico Roofing Systems; VersiCore MP-H Tapered.

## 2.08 ACCESSORIES

A. Prefabricated Roof Expansion Joint Flashing: Butyl sheet over closed-cell foam backing seamed to galvanized steel flanges.

B. Prefabricated Flashing Accessories:
1. See Section 07 62 00 for metal counterflashing and trim information.
2. Corners and Seams:
    a. Inside/Outside Corner, White on Black: 60 mil, 0.060 inch (1.5 mm) thick, 7 by 9 inches (178 by 229 mm) precut, uncured EPDM with 30 mil, 0.030 inch (0.76 mm) thick factory-applied tape.
        1) Products:
            (a) Versico Roofing Systems; VersiGard White Quick-Applied.
    b. Curb Flashing: 60 mil, 0.060 inch (1.5 mm) thick, cured EPDM with 30 mil, 0.030 inch (0.76 mm) thick, factory-applied tape along entire width.
        1) Products:
            (a) Versico Roofing Systems; VersiGard White Peel and Stick EPDM.
3. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
    a. Pipe Seals: Provide factory-applied tape on deck flange.
    b. Products:
        1) Versico Roofing Systems; VersiGard Quick-Applied.
4. Sealant Pockets: Same material as membrane, with manufacturer's standard accessories, in manufacturer's standard configuration.
    a. Pourable Sealant Pocket: 2 inches (51 mm) wide plastic support strip with factory-applied, adhesive-backed uncured EPDM flashing.
    b. Pocket Diameter: 4 inch (102 mm), nominal.
    c. Products:
        1) Versico Roofing Systems; VersiGard Quick-Applied.

C. Insulation Adhesive: Two component polyurethane, expanding foam.

D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, and compatible with roofing materials; 6 inches (152 mm) wide; self adhering.

E. Fasteners: Appropriate for application indicated as recommended and approved by membrane manufacturer.
1. Length as required for thickness of membrane and insulation material and penetration of deck substrate; with metal washers.

F. Membrane Adhesive: As recommended by membrane manufacturer.

G. Walkway Pads
1. VersiGard® EPDM Black Quick-Applied Molded Walkway Pads
2. Versico’s VersiGard EPDM Black Quick-Applied (QA) Molded Walkway Pads are designed to protect the membrane in those areas exposed to repetitive foot traffic.
3. Walkways must be installed at all traffi c concentration points (i.e., roof hatches, access doors, rooftop ladders, Davit crane, safety attachment points, etc.) regardless of traffic frequency. Walkways must also be installed if regular maintenance (once a month or more) is necessary to service rooftop equipment.

H. Roof Edgings and Terminations: Manufacturer's standard roof edge and termination accessories.
1. Color: As selected by Architect.

2. Drip Edge System: Drip edge system with decorative cover over continuous L-shaped cleat and slotted fastening holes at 12 inches (305 mm) on center.
    a. Products:
        1) Versico Roofing Systems; VersiTrim 200 Drip Edge.
3. Coping: Parapet wall type coping system providing galvanized steel hold-down cleats and snap-on coping cap.
    a. Parapet Wall Width: As indicated on drawings.
    b. Face and Back Leg Heights: 4 inches (102 mm) face height, and 4 inches (102 mm) back height, nominal.
    c. Products:
        1) Versico Roofing Systems; VersiTrim 300 Parapet Wall Coping.

## PART 3 EXECUTION

### 3.01 VERIFICATION OF CONDITIONS

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips, nailing strips, and reglets are in place.

### 3.02 SURFACE PREPARATION

A. Clean substrate thoroughly prior to roof application.

### 3.03 METAL DECK PREPARATION

A. Provide deck sheathing on metal deck, layout sheathing with long side perpendicular to flutes and stagger end joints; provide support at ends.
    1. Cut sheathing cleanly and accurately at roof offsets and/or protrusions to provide smooth surface, and tape joints.

B. Mechanically fasten sheathing to roof deck, in accordance with FM DS 1-29 and roofing manufacturer's installation instructions
    1. Fasten sheathing boards on entire roof area, using at least six fasteners with washers on each sheathing board.

### 3.04 INSTALLATION - GENERAL

A. Install roofing system in accordance with manufacturer's instructions, as well as NRCA (RM) and NRCA (WM) applicable requirements.

B. Application of roofing membrane during unsuitable weather is not permitted.

C. Application of roofing membrane when ambient temperature is outside temperature range recommended by manufacturer is not permitted.

D. Application of roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring is not permitted.

E. Exposing materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day is not permitted.

### 3.05 VAPOR RETARDER APPLICATION

A. Apply vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
    1. Extend vapor retarder under cant strips and blocking to deck edge.
    2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of air barrier plane.

B. Verify that vapor retarder is clean and dry, continuous, and ready for application of insulation.

## 3.06 INSULATION APPLICATION

A. Attachment of Insulation:
   1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and FM (AG), FM DS 1-28, and FM DS 1-29 applicable requirements.
   2. Embed second layer of insulation into full bed of adhesive in accordance with roofing and insulation manufacturer's instructions.

B. Installing wet, damaged, or warped insulation boards is not permitted.

C. Apply subsequent layers of insulation with joints staggered minimum 6 inches (152 mm) from joints of preceding layer.

D. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

E. Apply boards with edges in moderate contact without forcing, and with gap between boards no greater than 1/4 inch (6 mm) wide; cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

F. Tape joints of insulation in accordance with roofing and insulation manufacturer's instructions.

G. Only apply quantity of insulation than can be completely waterproofed in same day.

## 3.07 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears; place sheet membrane into place without stretching.

B. Shingle joints on sloped substrates in direction of drainage.

C. Overlap edges, ends, and seal seams by contact adhesive, minimum 3 inches (75 mm) wide, sealing permanently waterproof.

D. At membrane intersections with vertical surfaces, provide the following:
   1. Extend membrane over and up cant strips at least 4 inches (102 mm) onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.

E. Install roofing expansion joints as indicated on drawings, and ensure joints are watertight.

F. Coordinate installation of roof related flashings, sumps, and drains; locate field splices away from low areas and roof drains, and shingle lap upslope sheets over downslope sheets.

G. Daily Seal: Provide daily seal in accordance with manufacturer's installation instructions at end of each work day to prevent infiltration of water at incomplete flashings, terminations, and other unfinished membrane edges.

## 3.08 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Remove wrappings, empty containers, paper, and other debris from roof daily, and dispose of debris in compliance with local, State, and Federal regulations.

C. Remove bituminous markings from finished surfaces.

D. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

E. Repair or replace defaced or damaged finishes caused by work of this section.

**END OF SECTION 07 53 23**

**SECTION 07 84 00**
**FIRESTOPPING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

### 1.02 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

B. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).

C. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2023b.

D. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a.

E. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

### 1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

### 1.05 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Firestopping Manufacturers:
   1. 3M Fire Protection Products: www.3m.com/firestop/#sle.
   2. Fire Shield, LLC: www.fireshieldlv.com/#sle.
   3. Hilti, Inc: www.hilti.com/#sle.
   4. RectorSeal, a CSW Industrials Company: www.rectorseal.com/firestop-solutions/#sle.
   5. Specified Technologies Inc: www.stifirestop.com/#sle.
   6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

### 2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.

B. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.

C. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.

D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

### 2.04 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: See drawings for required systems and ratings.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

### 3.02 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Install labeling required by code.

### 3.03 CLEANING

A. Clean adjacent surfaces of firestopping materials.

### 3.04 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION 07 84 00**

**SECTION 07 92 00**
**JOINT SEALANTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

### 1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).

B. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

E. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.

F. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.

G. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

H. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Nonsag Sealants:
   1. Adfast USA Inc: www.adfastcorp.com/#sle.
   2. Adhesives Technology Corporation: www.atcepoxy.com/#sle.
   3. Bostik Inc: www.bostik-us.com/#sle.
   4. Dow: www.dow.com/#sle.
   5. Everkem Diversified Products, Inc: www.everkemproducts.com/#sle.
   6. Franklin International, Inc: www.titebond.com/#sle.
   7. Henry Company: www.henry.com/#sle.
   8. Hilti, Inc: www.hilti.com/#sle.
   9. Master Builders Solutions: www.master-builders-solutions.com/en-us/#sle.
   10. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com/#sle.
   11. Pecora Corporation: www.pecora.com/#sle.
   12. QUIKRETE Companies: www.quikrete.com/#sle.
   13. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
   14. Sika Corporation: www.usa.sika.com/#sle.
   15. Specified Technologies Inc: www.stifirestop.com/#sle.
   16. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.

17. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
18. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Interior Joints:
      a. Do not seal interior joints indicated on drawings as not sealed.
      b. Do not seal gaps and openings in gypsum board and suspended ceilings
      c. Do not seal through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
      d. Seal open joints except specific open joints indicated on drawings as not sealed.

## 2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

## 2.04 NONSAG JOINT SEALANTS

A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.

B. Silicone Sealant: ASTM C920, Grade NS, Use T; single component, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
   1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
   2. Color: To be selected by Architect from manufacturer's standard range.

C. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's standard range.
   4. Cure Type: Single component, neutral moisture curing.

D. Polymer Sealant: ASTM C920; single component, cured sealant is paintable and mold/mildew resistant, low odor and VOC, and ultraviolet (UV) resistant.
   1. Adheres to wet surfaces.
   2. Color: White.

E. Hybrid Elastomeric Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Hardness Range: 15 to 25, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's standard range.
   4. Service Temperature Range: Minus 75 to 300 degrees F (Minus 60 to 150 degrees C).

F. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 35 percent, minimum.
   2. Color: To be selected by Architect from manufacturer's standard range.

G. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
   1. Movement Capability: Plus and minus 35 percent, minimum.
   2. Color: To be selected by Architect from manufacturer's standard range.

H. Acrylic Latex Sealant, Water-Based: ASTM C834 Type OP - Opaque and Grade Minus 18 degrees C (0 degrees F); ASTM C920 Class 100/50 for white and colors, and Class 25/25 for clear.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Application Temperature: Within range of 40 to 120 degrees F (4 to 49 degrees C)
   3. Service Temperature Range: From 0 to 160 degrees F (minus 18 to 71 degrees C).

I. Acrylic Latex Sealant: ASTM C834; for use as acoustical sealant and in firestopping systems for expansion joints and through penetrations.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Fire Rated System: Complies with UL 263 and ASTM E119 with UL fire resistance classifications.

J. Noncuring Butyl Sealant: Solvent-based, single component, nonsag, nonskinning, nonhardening, nonbleeding; nonvapor permeable; intended for fully concealed applications.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

### 3.02 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

**END OF SECTION 07 92 00**

**SECTION 08 06 71**
**DOOR HARDWARE SCHEDULE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Preliminary schedule of door hardware sets for swinging and other door types as indicated on drawings.

### 1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Requirements to comply with in coordination with this section.

### 1.03 REFERENCE STANDARDS

A. BHMA A156.18 - Standard for Materials and Finishes; 2020.

B. DHI (H&S) - Sequence and Format for the Hardware Schedule; 2019.

### 1.04 PROJECT INFORMATION

A. Project Name: Town of Montgomery Police Station.

B. Architect: Jason T. Anderson Architect, P.C. dba ADG Architects.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Comply with submittal requirements as indicated in Section 08 71 00.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Only manufacturers listed in Door Hardware Schedule or Section 08 71 00 are considered acceptable, unless noted otherwise.

B. Obtain each type of door hardware as indicated from a single manufacturer and single supplier.

C. Manufacturer's Abbreviations: Coordinate with manufacturers listed in Section 08 71 00.
   1. GJ - Glynn Johnson.
   2. HES - HES.
   3. IVE - Ives.
   4. LCN - LCN.
   5. PEM - Pemko.
   6. ROC - Rockwood.
   7. SCH - Schlage.
   8. VD - Von Duprin.
   9. ZRO - Zero Industries, Inc.

### 2.02 DESCRIPTION

A. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.
   1. Provide door hardware item(s) as required for similar purposes, even when item is not listed for a door in Door Hardware Schedule.
   2. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and functionality.
   3. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated on drawings.
   4. Quantities listed are for each Pair (PR) of doors, or for each Single (SGL) door, as indicated in hardware sets.

## 2.03 FINISHES

A. Finishes: Complying with BHMA A156.18.

## PART 3 EXECUTION

## 3.01 DOOR HARDWARE SCHEDULE

A. Organize listing of door hardware components within each hardware set in compliance with 10-Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.

B. Set 01
   1. For use on Door #(s): S100, S100-1
   2. Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 2 | EA | Continuous Hinge | 112XY EPT | 626 | IVE |
| 2 | EA | Power Transfer | EPT10 | 689 | VON |
| 1 | E | Rem Mullion | KR4954 | 689 | VON |
| 1 | EA | Elec Panic Hardware | RX-98-EO | 626 | VON |
| 1 | EA | Elec Panic Hadware | RX-QEL-98-NL 24 VDC | 626 | VON |
| 1 | EA | SFIC Mortise Cyl | 80-102 X K510-730 | 626 | SCH |
| 1 | EA | SFIC Rim Housing | 80-129 | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 2 | EA | Closer | 4040XP SHCUSH TBWMS | 689 | LCN |
| 1 | EA | Rain Drip | 142A | AA | ZER |
| | SET | Perimeter Gasketing | By Door Manufacterer | | |
| 2 | EA | Door Sweep | By Door Manufacterer | | |
| 1 | EA | Threshold | 8724A | MIL | ZER |
| 2 | EA | Wire Harness (1 in frame, 1 in door) | Allegion Connect Type & length as required | | SCH |
| 2 | EA | Door Contact | 679-05 | WHT | SCE |
| 1 | SET | Power Supply | By Division 28 | | |
| 1 | EA | Card Reader | | | |

   a. Coordinate with electrical and access control systems.
   b. Operational Descrition: Both doors normally closed and locked; valid credential will momentarily retract latch bolt in panic hardware to allow entry.
   c. Free egress at all times for both doors.

C. Set #02
   1. For use on Door #(s): 133
   2. Provide each SGL door(s) with the following:

| **QTY** | | **DESCRIPTION** | **CATALOG NUMBER** | **FINISH** | **MFR** |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Privacy Lockset w/ Outside Indicator | ND40 ATH OS OCG | 626 | SCH |
| 1 | EA | Overhead Stop | 90S | 630 | GJ |
| 1 | EA | Closer | 4040 XP REG TBWMS | 689 | LCN |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW B-CS | US32D | IVE |
| 3 | EA | Silencer ** | SR64/65 as req'd | GRY | IVE |
| 1 | EA | Signage | BF689 - UNISEX | BLUE | ROC |

   a. ** Omit where smoke / fire seals are provided.
   b. Signage: Raised characters and Grade 2 Braile translation - submit documentation for approval.

D. Set #03
   1. For use on Door #(s): 134
   2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Privacy Lockset w/ Outside Indicator | ND40 ATH OS OCG | 626 | SCH |
| 1 | EA | Wall Stop | WS406 / 407 CCV | 630 | GJ |
| 1 | EA | Closer | 4040 XP REG TBWMS | 689 | LCN |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW B-CS | US32D | IVE |
| 1 | EA | Smoke Seal | 488S X LAR as required | GRY | ZRO |
| 1 | EA | Signage | BF689 - UNISEX | BLUE | ROC |

a. Signage: Raised characters and Grade 2 Braile translation - submit documentation for approval.

E. Set #04
1. For use on Door #(s): 115, 118
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Passage Lockset | ND10S ATH | 626 | SCH |
| 1 | EA | Closer | 4040XP Reg TBWMS | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Wall Stop | WS 406 / 407 CCV | 630 | IVE |
| 1 | EA | Smoke Seal | 488S X LAR | BLK | ZRO |

a. ** Omit where smoke / fire seals are provided.

F. Set #05
1. For use on Door #(s): 110
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Passage Lockset | ND10S ATH | 626 | SCH |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |
| 1 | EA | Closer | 4040XP Reg TBWMS | 689 | LCN |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Smoke Seal | 488S X LAR | BLK | ZRO |

G. Set #06
1. For use on Door #(s): 102, 104, 113, 113-1, 135.
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Storeroom Lockset | NDE80 HD ATH | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP SCUSH TBWMS | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Wall Stop | WS406 / 407 CCV | 630 | IVE |
| 1 | EA | Automatic Door Bottom | 365AA | ALM | ZRO |
| 1 | SET | Smoke Seal | 488S X LAR as required | BK | ZRO |

a. Coordinate with Drawings A-004 and A-005

H. Set #07
1. For use on Door #(s): 102-1, 104-1, 108, 109, 120, 121, 127, 128, 129, 130, 136-1, 201, 203, 204, 205, 206, 207, 209
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Storeroom Lockset | NDE80 HD ATH | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP SCUSH TBWMS | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Wall Stop | WS406 / 407 CCV | 630 | IVE |
| 1 | EA | Atuomatic Door Bottom | 365AA | ALM | ZRO |
| 1 | SET | Smoke Seal | 488S X LAR as required | BK | ZRO |

a. *Coordinate with Drawings A-004 and A-005; on all fire rated doors

I. Set #08
1. For use on Door #(s): 105, 112
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Lockset | NDEBHD ATH Battery Operated | 626 | SCH |
| 1 | EA | Closer | 4040XP SCUSH TBWMS | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Wall Stop | WS406 / 407 CCV | 630 | IVE |
| 1 | EA | Atuomatic Door Bottom | 365AA | ALM | ZRO |
| 1 | SET | Smoke Seal | 488S X LAR | BK | ZRO |

a. *Coordinate with Drawings A-004 and A-005
b. Coordinate with electrical and security systems.
c. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
d. Free egress always allowed.

J. Set #09
1. For use on Door #(s): 107
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Storeroom Lockset | NDE80HD ATH | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP REG TBWMS | 689 | LCN |
| 1 | EA | OH Stop | 90S | 630 | GLY |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |

| | | | | | |
|---|---|---|---|---|---|
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | SET | Smoke Seal | 488S X LAR | BK | ZRO |
| 1 | EA | Automatic Door Bottom | 365AA | ALM | ZRO |

a. *Coordinate with Drawings A-004 and A-005
b. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
c. Free egress always allowed.

K. Set #10
1. For use on Door #(s): 122
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Electric Mortise Lockset | L9095HDEL 07A CON 12/24 VDC | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP SCUSH TBWMS | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | | | SCH |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Smoke Seal | 488S X LAR | Brown | ZRO |
| 1 | EA | Automatic Door Bottom | 365AA | ALM | ZRO |
| 1 | EA | Threshold | 8724A | A | ZRO |
| 1 | EA | Wire Harness | Allegion Connect, type & length as required | | SCH |
| 1 | Ea | Power Supply | | | |
| 2 | EA | Card Reader | | | |

a. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
b. Coordinate with Electrical, fire and access control systems
c. Door Normally closed and locked on both sides.
d. Presenting valid credential to reader will momentarily unlock lockset and allow entry or exit.
e. When fire alarm sounds or power is lost, door will be unlocked on both sides (fail safe).

L. Set #11
1. For use on Door #(s): 123, 124
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 2 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Hinge | 5BB1 4.5 X 4.5`CON TW4 | 652 | IVE |
| 1 | EA | Electric Mortise Lockset | L9095HDEL 07A CON 12/24 VDC | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP REGTBWMS | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | | | SCH |
| 1 | EA | Kick Plate | 8400 24" x 2" LDW | US32D | IVE |
| 1 | EA | Wall Stop | WS 406 / 407 as required | 630 | ZRO |
| 1 | EA | Smoke Seal | 488S X LAR | Brown | ZRO |

| | | | | | |
|---|---|---|---|---|---|
| 1 | EA | Atuomatic Door Bottom | 365AA | ALM | ZRO |
| 1 | EA | Wire Harness (1 in frame, 1 in door) | Allegion connect, type & length as required | | SCH |
| 1 | Set | Power Supply | | | |
| 1 | EA | Card Reader | | | |

a. *Coordinate with Drawings A-004 and A-005
b. Coordinate with Electrical, fire and access control systems
c. Door Normally closed and locked on both sides.
d. Presenting valid credential to reader will momentarily unlock lockset and allow entry or exit.
e. When fire alarm sounds or power is lost, door will be unlocked on both sides (fail safe).

M. Set #12 - NOT USED

N. Set #13
1. For use on Door #(s): 131
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Lockset | NDEBHD ATH Battery Operated | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP REG TBWMS | 689 | LCN |
| 1 | EA | Wall Stop | WS 406 / 407CCV | 630 | IVE |
| 1 | SET | Smoke Seal * | 488S X LAR | BK | ZRO |
| 1 | EA | Automatic Door Bottom | 365AA | ALM | ZRO |

a. Coordinate with Drawings A-004 and A-005
b. Coordinate with electrical and security systems
c. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
d. Free egress always allowed.

O. Set #14
1. For use on Door #(s): 103
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 NRP | 652 | IVE |
| 1 | EA | Wireless Electronic Lockset | NDEBHD ATH Battery Operated | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP EDA TBWMS | 689 | LCN |
| 1 | EA | Wall Stop | WS 406 / 407CCV | 630 | IVE |
| 3 | EA | Silencer | SR64 / 65 as required | GRY | IVE |

a. Coordinate with electrical and security systems.
b. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
c. Free egress always allowed.

P. Set #15
1. For use on Door #(s): 103-1
2. Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Lockset | NDEBHD ATH Battery Operated | 626 | SCH |
| 1 | EA | Closer | 4040XP | 689 | LCN |
| 1 | EA | *Anti Friction Latch; 3/4" throw | 14-042 | | SCH |
| 1 | EA | Wall Stop | WS 406 4 07CCV | 630 | IVE |
| 1 | SET | Smoke Seal | 488S X LAR | BK | ZRO |
| 1 | EA | Automatic Door Bottom | 365AA | ALM | ZRO |

a. Coordinate with Drawings A-004 and A-005
b. ** Omit where smoke / fire seals are provided.
c. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
d. Free egress always allowed.

Q. Set 16
1. For use on Door #(s): 111
2. Provide each single door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 NRP | 628 | IVE |
| 1 | EA | Panic Device | 98-L-AL-P | 626 | VON |
| 1 | EA | Electronic Lock | XE360 | 626 | SCH |
| 1 | EA | Closer | 4040XP SHSCU TBWMS | 689 | LCN |
| 1 | EA | Rain Drip | 142A | AA | ZRO |
| 1 | EA | Gasketing | 270A | A | PEM |
| 1 | EA | Door Sweep | 8192AA | AA | ZRO |
| 1 | EA | Threshold | 8724 A | A | ZRO |

a. Door normally closed and locked; valid credential will momentarily unlock lever. Free egress at all times.
b. High Voltage electrical room, double door

R. Set #17
1. For use on Door #(s): 122-1
2. Provide each DBL door(s) with the following:

| **QTY** | | **DESCRIPTION** | **CATALOG NUMBER** | **FINISH** | **MFR** |
|---|---|---|---|---|---|
| 2 | EA | Continuous Hinge | 112 XY EPT | 628 | IVE |
| 2 | EA | Power Transfer | EPT10 | 689 | Von |
| 1 | EA | Removable Mullion | KR4954 | 689 | VON |
| 1 | EA | Electronic Panic Device | RX-98-EO | 626 | VON |
| 1 | EA | Electronic Panic Device | RX-QEL-98-NL 24 VDC | 626 | VON |
| 1 | EA | SFIC Mortise Cylinder | 80-102 X K510-730 | 626 | SCH |
| 1 | EA | SFIC Rim Housing | 80-129 | 626 | SCH |
| 2 | EA | Closer | 4040XP SHCUSH TBWMS | 689 | LCN |
| 1 | EA | Rain Drip | 142A | AA | ZRO |
| 1 | EA | Gasketing | 270A | A | ZRO |
| 1 | EA | Meeting Stile | 326AA-S | AA | ZRO |
| 2 | EA | Door Sweep | 8192AA | AA | ZRO |
| 1 | EA | Threshold | 8724A | A | ZRO |
| 2 | EA | Wire Harness (1 in door, 1 in frame) | Allegion Connect Type & Length as required | | SCH |
| 1 | SET | Power Supply | | | |
| 1 | EA | Card Reader | | | |

a. Coordinate with electrical and security systems.
b. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
c. Free egress always allowed.

S. Set #18
1. For use on Door #(s): 125, 126, 136, 207-1
2. Provide each single door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 NRP | 652 | IVE |
| 1 | EA | Wireless Electronic Lockset | NDEBHD ATH Battery Operated | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP SCUSH TBWMS | 628 | LCN |
| 1 | EA | Rain Drip Cap | 142A | AA | ZRO |
| 1 | EA | Gasketing | 270A | A | ZRO |
| 1 | EA | Door Sweep | 8192AA | AA | ZRO |
| 1 | EA | Threshold | 8724A | MIL | ZRO |

a. Coordinate with electrical and security systems.
b. Door normally closed and locked; presenting valid credential to reader will momentaily unlock lockset and allow entry.
c. Free egress always allowed.

T. Set #19
1. For use on Door #(s): 117
2. Provide each SGL door(s) with the following:

| **QTY** | | **DESCRIPTION** | **CATALOG NUMBER** | **FINISH** | **MFR** |
|---|---|---|---|---|---|
| 3 | EA | Hinge | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | Wireless Electronic Storeroom Lockset | ND80 HD ATH | 626 | SCH |
| 1 | EA | SFIC Core | 80-036 | 626 | SCH |
| 1 | EA | Closer | 4040XP SCUSH TBWMS | 689 | LCN |
| 1 | EA | Armor Plate | 8400 34" x 2" LDW | 630 | IVE |
| 1 | EA | Wall Stop | WS406/407CVX | 630 | IVE |
| 1 | SET | Smoke Seal | 488S X LAR | BK | ZRO |

a. Coordinate with Drawings A-004 and A-005

**END OF SECTION 08 06 71**

## SECTION 08 11 13
## HOLLOW METAL DOORS AND FRAMES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Fire-rated hollow metal doors and frames.

C. Thermally insulated hollow metal doors with frames.

D. Sound-rated hollow metal doors and frames.

E. Bullet-resistant hollow metal doors and frames.

F. Hollow metal borrowed lites glazing frames.

G. Accessories, including glazing, louvers, and matching panels.

### 1.02 RELATED REQUIREMENTS

A. Section 08 34 73 - Sound Control Door Assemblies.

B. Section 08 71 00 - Door Hardware.

C. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

### 1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. ASCE: American Society of Civil Engineers.

C. HMMA: Hollow Metal Manufacturers Association.

D. NAAMM: National Association of Architectural Metal Manufacturers.

E. NFPA: National Fire Protection Association.

F. SDI: Steel Door Institute.

G. UL: Underwriters Laboratories.

### 1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

G. 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; 2023.

H. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

J. ITS (DIR) - Directory of Listed Products; Current Edition.

K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

M. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.

N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

Q. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

R. UL (DIR) - Online Certifications Directory; Current Edition.

S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

T. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

### 1.06 QUALITY ASSURANCE

A. Maintain at project site copies of reference standards relating to installation of products specified.

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
   2. Mesker, dormakaba Group: www.meskeropeningsgroup.com/#sle.
   3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   4. Basis of Design: Steelcraft, an Allegion brand; F Series: www.allegion.com/sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Bullet-Resistant Hollow Metal Doors and Frames:
   1. AMBICO Limited: www.ambico.com/#sle.
   2. Fleming Door Products, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Krieger Specialty Products: www.kriegerproducts.com/#sle.
   4. Megamet Industries, Inc: www.megametusa.com/#sle.
   5. Mesker, dormakaba Group: www.meskeropeningsgroup.com/#sle.
   6. Republic Doors, an Allegion brand; DE-BR: www.republicdoor.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Door Edge Profile: Manufacturers standard for application indicated.
4. Typical Door Face Sheets: Flush.
5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

**2.03 HOLLOW METAL DOORS**

A. Exterior hollow metal insulated door.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 2 - Heavy-duty.
    b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model see drawings.
    d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
4. Weatherstripping: Refer to Section 08 71 00.
5. Door Finish: Factory primed and field finished.

B. Interior hollow metal non-rated door.

C. Interior Doors, Hollow Metal, Non-Fire Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 1 - Standard-duty.
    b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model see drawings.
    d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

D. Interior hollow metal fire rated door.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 2 - Heavy-duty.

b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model see drawings.
d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.

2. Fire Rating: As indicated on drawings, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
   a. Attach fire rating label to each fire rated unit.
4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

E. Sound Control Door Assemblies: Refer to Section 08 34 73.

F. Bullet-Resistant Doors; Exterior: heavy duty, threat level 3; 14g door face thickness.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 2 - Heavy-duty.
   b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model see drawings for details.
   d. Door Face Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
2. Bullet Resistance: UL 752, Threat Level Rating - Level 3.
3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
4. Door Thickness: As required to meet requirements indicated.
5. Hinge Rail and Reinforcement: Non-beveled edge, reinforced with continuous steel channel, 12 gauge, 0.093 inch (2.3 mm) minimum metal thickness, welded at 5 inch (127 mm) on center maximum, and compatible with 4-1/2 inch (114 mm) full mortise template and continuous geared hinges.

## 2.04 HOLLOW METAL FRAMES

A. Basis of Design: Steelcraft, an Allegion brand; 'F' Series: www.allegion.com/sle.

B. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

C. Exterior Door Frames: Face welded type, galvanized.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
2. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
3. Frame Finish: Factory primed and field finished.
4. Weatherstripping: Separate, see Section 08 71 00.

D. Interior Door Frames, Non-Fire Rated: Face welded type.
1. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
2. Frame Finish: Factory primed and field finished.

E. Interior Door Frames, Non-Fire Rated: Knock-down type.
1. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
2. Frame Finish: Factory primed and field finished.

F. Door Frames, Fire-Rated: Face welded type.
1. Fire Rating: Same as door, labeled.
2. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
3. Frame Finish: Factory primed and field finished.

G. Bullet-Resistant Door Frames: Comply with UL 752, with same level of bullet resistance as door; face welded construction, ground smooth, fully prepared and reinforced for hardware installation.
1. Frame Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
2. Frame Finish: Factory primed and field finished.

H. Mullions for Pairs of Doors: Fixed, except where removable is indicated, with profile similar to jambs.

I. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

J. Transom Bars: Fixed, of profile same as jamb and head.

K. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

L. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches (102 mm) high to fill opening without cutting masonry units.

M. Frames Wider than 48 inches (1219 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.

**2.05 FINISHES**

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

**2.06 ACCESSORIES**

A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.

B. Vision Lites
   1. Size 4" x 25", fire rated
   2. Gauge: 18g
   3. Mechanical screw fasteners, non- friction fit.

C. Glazing: As specified in Section 08 80 00, factory installed.

D. Astragals for Double Doors:
   1. Exterior Doors: Steel, Z-shaped.
   2. Fire-Rated Doors: Steel, shape as required for fire rating.

E. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.

F. Mechanical Fasteners for punch and dimple to wood and / or concrete connection: Phillips head, flush, steel with electroplated zinc finish of size per manufacturers instructions.
   1. For concrete or masonry: either shields or self-tapping; contractors option.

G. Polyurethane Foam for Setting Frames:
   1. Soudafoam Door & Window; by SoudalAccumetric, 350 Ring Road, Elizabethtown, KY 42701; (877)-873-8739. www.soudalusa.com; e-mail: info@soudalusa.com.
   2. Penosil Premium FireRated Gunfoam B1; www.penosil.com
   3. OSI Quad Foam; www.ositough.com
   4. Substitutions: or equal per section 01 6000 Product Requirements.

H. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

I. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Polyurethane punch and dimpled frames in wood, metal, concrete and masonry construction, gun method; brace frames so that pressure of foam before setting will not deform frames.

E. Caulk perimeter of frame both sides with Silicone sealant per section 07 9200.

F. Install door hardware as specified in Section 08 71 00.

G. Comply with glazing installation requirements of Section 08 80 00.

H. Touch up damaged factory finishes.

**3.02 TOLERANCES**

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

**3.03 ADJUSTING**

A. Adjust for smooth and balanced door movement.

**END OF SECTION 08 11 13**

**SECTION 08 14 16**
**FLUSH WOOD DOORS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, and acoustical.

### 1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 71 00 - Door Hardware.

C. Section 08 80 00 - Glazing.

### 1.03 REFERENCE STANDARDS

A. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

B. ASTM E413 - Classification for Rating Sound Insulation; 2022.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

E. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   2. Include certification program label.

D. Samples: Submit two samples of door veneer, 4 by 4 inches (100 by 100 mm) in size illustrating wood grain, stain color, and sheen.

E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

F. Test Reports: Show compliance with specified requirements for the following:
   1. Sound-retardant doors and frames; sealed panel tests are not acceptable.

G. Warranty, executed in Owner's name.

### 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. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Woodwork Quality Assurance Program:
   1. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by quality assurance program.
   3. Provide designated labels on installed products as required by quality assurance program.
   4. Submit documentation upon completion of installation that verifies this work is in compliance with specified requirements.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

## 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
   1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Basis of Design: Lambton Doors; www.lambtondoors.com
   2. Haley Brothers: www.haleybros.com/#sle.
   3. Krieger Specialty Products: www.kriegerproducts.com/#sle.
   4. Masonite Architectural: www.architectural.masonite.com/#sle.
   5. Oregon Door: www.oregondoor.com/#sle.
   6. VT Industries, Inc: www.vtindustries.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Sound-Rated Doors: Minimum STC as indicated on drawings, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
   4. Wood veneer facing with factory transparent finish as indicated on drawings.

## 2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

C. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating specified; plies and faces as indicated above.

## 2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Natural birch, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Any option allowed by quality standard for grade.

2. "Running Match" each pair of doors and doors in close proximity to each other.
3. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet (3 m) of each other when doors are closed.

**2.05 DOOR CONSTRUCTION**

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

E. Provide edge clearances in accordance with the quality standard specified.

**2.06 FINISHES - WOOD VENEER DOORS**

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

B. Factory finish doors in accordance with finish schedule.

C. Seal door top edge with color sealer to match door facing.

**2.07 ACCESSORIES**

A. Hollow Metal Door Frames: See Section 08 11 13.

B. Wood Louvers:
1. Material and Finish: match door veneer species.

C. Door Window Frames: Door window frames with glazing securely fastened within door opening.
1. Size: As indicated on drawings.
2. Glazing: 1/4 inch (6.4 mm) thick, tempered glass, in compliance with requirements of authorities having jurisdiction.

D. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

E. Door Hardware: See Section 08 71 00.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

**3.02 INSTALLATION**

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

**3.03 TOLERANCES**

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

### 3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

**END OF SECTION 08 14 16**

## SECTION 08 34 73
## SOUND CONTROL DOOR ASSEMBLIES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Sound control door assemblies.
   1. Metal doors and frames.
   2. Wood doors and metal frames.
   3. Fire-rated doors and frames.

### 1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

### 1.03 ABBREVIATIONS AND ACRONYMS

### 1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2019.

C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

H. 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; 2023.

I. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

J. ASTM E413 - Classification for Rating Sound Insulation; 2022.

K. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

L. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

M. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

O. ITS (DIR) - Directory of Listed Products; Current Edition.

P. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

Q. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

R. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.

S. NAAMM HMMA 865 - Guide Specifications for Sound Control Hollow Metal Door and Frame Assemblies; 2013.

T. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

U. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

V. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

W. SDI 128 - Guidelines for Acoustical Performance of Standard Steel Doors and Frames; 2019.

X. UL (DIR) - Online Certifications Directory; Current Edition.

Y. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

Z. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Samples: Submit two samples of metal, 2 inch by 2 inch in size ( 50 mm by 50 mm in size) showing factory finishes, colors, and surface texture.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

G. Manufacturer's Qualification Statement.

H. Testing Agency's Qualification Statement.

### 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

C. Testing Agency Qualifications: Independent testing agency accredited as an acoustical laboratory and certified to perform specified field testing.

D. Maintain at project site copies of reference standards relating to installation of products specified.

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect metal doors in compliance with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) and specified requirements.

B. Protect wood doors in compliance with WDMA I.S. 1A and specified requirements.

C. Store wood doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas, or in areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

D. Remove doors and frames from resilient packaging upon delivery on site and inspect for damage, provide cover over doors for protection until installed, and store in vertical position properly braced with blocking to permit air circulation between components.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Metal Sound Control Door Assemblies:
   1. AMBICO Limited: www.ambico.com/#sle.
   2. IAC Acoustics; Noise-Lock Acoustic Doors: www.iacacoustics.com/#sle.
   3. Noise Barriers; QuietPivot Acoustical Sound Control Door: www.noisebarriers.com/#sle.

4. Overly Door Company: www.overly.com/#sle.
5. Premier Steel Doors and Frames; Sound Transmission Control Doors and Frames: www.trustpremier.com/#sle.

B. Wood Sound Control Door Assemblies:
1. AMBICO Limited: www.ambico.com/#sle.
2. Overly Door Company: www.overly.com/#sle.
3. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 REGULATORY REQUIREMENTS

A. Accessibility: Comply with ICC A117.1 and ADA Standards.

B. Opening Force of Sound Control Doors, Non-Fire Rated: 5 lbs (22.2 N), maximum, in compliance with ADA Standards.

C. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with specified requirements for each type; for instance, a sound control door is also indicated as being an exterior door must comply with requirements specified for sound control doors and exterior doors; where two requirements conflict, comply with most stringent.

## 2.03 COMPONENTS

A. Door Edge Profile: Manufacturer's standard for application indicated.

## 2.04 SOUND CONTROL DOORS

A. Metal Sound Control Interior Doors:
1. Metal Doors: Refer to drawings for locations and additional requirements.
a. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
1) Level 2 - Heavy-duty.
2) Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
3) Model 1 - Full Flush.
4) Comply with guidelines of SDI 128 for acoustic performance of metal doors and frames.
5) Door Face Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
b. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
1) Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
(a) Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) where necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
2. Sound Transmission Class (STC) Rating of Sound Control Door Assembly: STC of 56, minimum, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
3. Door Thickness: Comply with sound control requirements as indicated on the drawings.
4. Door Face Sheets: Flush.
5. Sound Seals: As required by manufacturer to meet indicated sound control ratings.

B. Wood Sound Control Interior Doors: Provide fire-rated door construction as indicated.

1. Wood Doors: Refer to drawings for locations and additional requirements.
    a. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless otherwise indicated.
    b. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
        1) Wood veneer facing with factory transparent finish as indicated on drawings.
2. Sound Transmission Class (STC) Rating of Sound Control Door Assembly: STC of 56, minimum, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
3. Door Thickness: As required to comply with sound control requirements as indicated.
4. Door Face Sheets: Flush.
5. Door Finish: Factory finished.
6. Sound Seals: As required by manufacturer to meet indicated sound control ratings.
7. Fire-Rated Doors:
    a. Fire Rating: As indicated on Door Schedule, complying with NFPA 80 and tested in accordance with UL 10C and NFPA 252 as positive pressure fire tests.
    b. Provide units listed and labeled by UL (DIR) or ITS (DIR).
        1) Attach fire rating label to each fire rated unit.
    c. Door Core Material: As required by manufacturer to meet indicated fire and sound control ratings.

## 2.05 SOUND CONTROL DOOR FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Metal Sound Control Interior Door Frames: Face-welded type.
    1. Frame Finish: Factory finished.
    2. Interior Door Frames, Non-Fire Rated:
        a. Frame Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.

## 2.06 DOOR HARDWARE

A. Hinges: Heavy-duty butt type by door manufacturer; see Section 08 71 00.

B. Threshold: Provide sound control/acoustic seal for sill of door in closed position by door manufacturer.

C. Sound Control Seals: Provide sound control/acoustic seals for jambs and head of door in closed position by door manufacturer.

## 2.07 FINISHES

A. Primer, Metal Doors and Frames: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard, in compliance with local VOC requirements.

B. Metal Door and Frame Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.

C. Wood Door Finish: Complying with WDMA I.S. 1A, premium grade, as indicated on drawings.
    1. Veneer Species: As selected by Architect from manufacturer's as indicated on drawings range.
        a. Matching: As indicated on drawings.
        b. Finish: As indicated on drawings.

## 2.08 ACCESSORIES

A. Use sound control foam to fill between frame and framing.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Touch up damaged factory finishes.

**3.02 TOLERANCES**

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 865.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

**3.03 ADJUSTING**

A. Adjust for smooth and balanced sound control door movement.

B. Adjust sound control doors so that seals are fully engaged when door is closed.

C. Adjust sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

**END OF SECTION 08 34 73**

## SECTION 08 43 13
## ALUMINUM-FRAMED STOREFRONTS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum doors and frames.

C. Weatherstripping.

### 1.02 RELATED REQUIREMENTS

A. Section 01 23 00 - Alternates

B. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

C. Section 08 80 00 - Glazing: Glass and glazing accessories.

### 1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

G. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

H. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

I. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
   1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

### 1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

### 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

## PART 2 PRODUCTS

### 2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Center-Set Style, Thermally-Broken:

1. Basis of Design: Kawneer North America; Trifab® VersaGlaze® 451T thermal glazed framing system.: www.kawneer.com/#sle..

### 2.02 BASIS OF DESIGN -- SWINGING DOORS

A. Basis of Design: Kawneer North America: www.kawneer.com/#sle.

B. Aluminum framed door; Kawneer entrance door, for TriFab 451 / Trifab 451T aluminum framing system.

C. Aluminum framed door: Model 350 entrance door, medium stile.

1. The door stile and rail face dimensions of the entrance door will be as follows:

| Model | Vertical Stile | Top Rail | Bottom Rail | Opt Bottom Rail |
|---|---|---|---|---|
| ~~190~~ | ~~2-1/8"~~ | ~~2-1/4"~~ | ~~3-7/8"~~ | ~~10"~~ |
| 350 | 3-1/2" | 3-1/2" | ----- | 10" |
| ~~500~~ | ~~5"~~ | ~~5"~~ | ~~6-1/2"~~ | ~~10"~~ |

2. Major portions of the door members to be 0.125" (3.2) nominal in thickness and glazing molding to be 0.05" (1.3) thick.
3. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
4. Provide adjustable glass jacks to help center the glass in the door opening.

### 2.03 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" (1.8 mm) 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 framing 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 B633 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 B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 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.

## 2.04 STOREFRONT AND WINDOW FRAMING SYSTEM

A. Aluminum framed, non-thermal, window wall, 4-1/2" wide.
   1. Basis of Design: Aluminum framed entrances, storefront, window; Kawneer Trifab® VersaGlaze® 451 Framing System non-thermal glazed framing system

B. Aluminum framed, thermal window.
   1. Kawneer IsoLock™ Thermal Break with a 1/4" (6.4 mm) separation 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.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Fasteners and Accessories:
   1. Manufacturer's standard corrosion-resistant, nonstaining, non-bleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.

E. Perimeter Anchors:
   1. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action

## 2.05 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   2. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   3. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   4. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   5. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   6. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
    a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf (75 Pa) pressure difference.

**2.06 COMPONENTS**

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
    1. Glazing Stops: Flush.

B. Glazing: See Section 08 80 00.

**2.07 MATERIALS**

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Fasteners: Stainless steel.

C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

**2.08 FINISHES**

A. Match curtain wall system.

B. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch (0.030 mm).
    1. Kawneer colors: as slected by Architect from Manufacturer's standard color selection.

C. Color: As selected by Architect from manufacturer's standard range.

**2.09 HARDWARE**

A. For each door, include weatherstripping, sill sweep strip, and threshold.

B. Other Door Hardware: See Section 08 71 00.

C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

**3.02 TOLERANCES**

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

**3.03 FIELD QUALITY CONTROL**

A. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

B. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

**3.04 ADJUSTING**

A. Adjust operating hardware and sash for smooth operation.

**3.05 CLEANING**

A. Remove protective material from pre-finished aluminum surfaces.

B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

**END OF SECTION 08 43 13**

## SECTION 08 44 13
## GLAZED ALUMINUM CURTAIN WALLS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and glass and metal infill panels.

B. Column covers.

### 1.02 RELATED REQUIREMENTS

A. Section 05 12 00 - Structural Steel Framing: Steel attachment members.

B. Section 08 43 13 - Aluminum-Framed Storefronts: Entrance framing and doors.

### 1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

B. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.

C. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.

D. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

H. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

K. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

L. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).

M. ASTM C1036 - Standard Specification for Flat Glass; 2021.

N. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

O. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials; 2019.

P. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2023.

Q. FBC TAS 201 - Impact Test Procedures; Testing Application Standard; 1994.

R. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard; 1994.

S. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard; 1994.

T. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

## 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Shop Drawings: Provide details of proposed structural sealant glazing (SSG) and weather sealant joints indicating dimensions, materials, bite, thicknesses, profile, and support framing.

E. Samples: Submit two samples manufacutrer's standard submittal package, illustrating finished aluminum surface, glazing, spandrel , and glazing materials.

F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

G. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.

H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

I. Designer's Qualification Statement.

J. Manufacturer's Qualification Statement.

K. Installer's Qualification Statement.

L. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

## 1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

## 1.06 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.
      c. Loosening or weakening of fasteners, attachments, and other components.
      d. Failure of operating units.

B. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and

design criteria indicated.

C. Human Impact: Shall be tested to meet AAMA 501.8.

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

### 1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

### 1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with installer.

C. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

## PART 2 PRODUCTS

### 2.01 BASIS OF DESIGN - CURTAIN WALL SYSTEMS

A. Glazed aluminum curtain wall: Kawneer 1600 Wall System 1 Curtain Wall

B. Pressure Cap Four Sides; Not Unitized, Field Assembled:
   1. Basis of Design: Kawneer North America Kawneer 1600 System 1: www.kawneer.com/#sle.
      a. Sight line, 2-1/2" (63.5), outside glazed pressure plate format.
      b. System depth: 7-1/2" (190.5mm) or as required.
      c. Tested to AAMA 501, ASTM E1886, ASTM E1996 and FBC TAS 201, FBC TAS 202, FBC TAS 203.

### 2.02 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Fabrication Method: Field fabricated stick system.
   2. Glazing Method: Field glazed system.
   3. Finish: Superior performing organic coatings.
      a. Factory finish surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   4. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
   1. Design Wind Loads: Comply with the applicable code.

2. Movement: Accommodate the following movement without damage to components or deterioration of seals:
    a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
    b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.
    c. Movement of curtain wall relative to perimeter framing.
    d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
    1. Test Pressure Differential: 10 psf (480 Pa).
    2. Test Method: AAMA 501.1.

D. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of wall area when tested in accordance with ASTM E283/E283M at 6.24 psf (300 Pa) pressure difference across assembly.

**2.03 COMPONENTS**

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
    1. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.78) wall thickness at any location for the main frame and complying with ASTM B221: 6063-T6 alloy and temper.

B. Glazing: Insulated glazing
    1. See Section 08 80 00.

C. Spandrel glazing and shadow box,
    1. Thickness to match storefront glazing
    2. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality-Q3, performance characteristics as indicated.
    3. Patterned Glass Type: ASTM C1036, Type II - Patterned Flat Glass, Quality-Q5, Form 3 - Patterned glass, performance characteristics as indicated.
    4. Color and pattern to match glazing.
    5. Shadow box: manufacturer's standard aluminum sheet
        a. Manufacturer's stand venting to the exterior in horizontal mulliens.

D. Column Covers: Aluminum, 20-gauge, 0.032-inch (0.81 mm) minimum thickness, finish to match curtain wall framing members.

E. Beam Covers: Aluminum, 20-gauge, 0.032-inch (0.81 mm) minimum thickness, finish to match curtain wall framing members.

F. Doors: See Section 08 43 13 - Aluminum Framed Storefronts

G. Versoleil™ SunShade - Outrigger/Single Blade System.
    1. Outriggers shall be painted to match Curtain Wall System.
    2. Louvers and fascia shall be painted or anodized to match Curtain Wall System.

H. Sun Screens: Shop fabricated, shop finished, extruded aluminum outriggers, louvers, and fascia, free of defects impairing strength, durability or appearance.
    1. Sun Screen Configuration: As indicated on drawings.
    2. Sizes: As indicated on drawings.
    3. Finish: Same as curtain wall mullion sections.
    4. Products:
        a. Basis of Design: Kawneer North America Versoleil™ SunShade - Outrigger/Single Blade System: www.kawneer.com/#sle.
        b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.

E. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, and compatible with flashing material.

F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

G. Glazing Accessories:
   1. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.
   2. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
   3. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
   4. Glazing Sealants: As recommended by manufacturer for joint type.

H. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

## 2.05 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics.
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints.
   3. Physical and thermal isolation of glazing from framing members.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing from exterior.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
   7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

C. Curtain Wall Framing: Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.

D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.06 FINISHES

A. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch (0.030 mm).
   1. Kawneer colors: as slected by Architect from Manufacturer's standard color selection.

## 2.07 ACCESSORIES

A. 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.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other related work.

B. Verify that curtain wall openings and adjoining water-resistive and air barrier seal materials are ready to receive work of this section.

C. Verify that anchorage devices have been properly installed and located.

### 3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

### 3.03 FIELD QUALITY CONTROL

A. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

B. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

### 3.04 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

### 3.05 PROTECTION

A. Protect installed products from damage until mm-dd-yyyy.

**END OF SECTION 08 44 13**

**SECTION 08 56 53**
**SECURITY WINDOWS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Security transaction windows.

### 1.02 REFERENCE STANDARDS

A. SSPC-Paint 33 - Coal Tar Mastic Coating, Cold-Applied; 2023.

B. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

### 1.03 ADMINISTRATIVE REQUIREMENTS

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's published data showing materials, construction details, dimensions of components, and finishes.

C. Shop Drawings: Drawings prepared specifically for this project, showing plans, elevations, sections, details of construction, anchorage to other work, hardware, and glazing.
   1. For new work show required opening dimensions and allowance for field deviation.

D. Test Reports: Test reports for specific window model and glazing to be furnished, showing compliance with specified requirements; window and glazing may be tested separately, provided window test sample adequately simulates the glazing to be used.
   1. Include testing agency qualifications.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with at least 5 years experience in the manufacture of windows of the type specified and able to provide test reports showing that their standard manufactured products meet the specified requirements; custom designed products not acceptable.

B. Testing Agency Qualifications: Independent testing agency able to show experience in conducting tests of the type specified.

### 1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Provide manufacturer's warranty agreeing to repair or replace windows and window components that fail within three years after Date of Substantial Completion due to, but not limited to, the following:
   1. Structural failure, failure of welds, and deterioration of metals and finishes beyond that expected under detention use and normal weathering.
   2. Failure of glazing due to excessive deflection of supporting members under wind load.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Security Transaction Windows:
   1. Quikserv; SC Slider / Ticket Window Combo: www.quikserv.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 ASSEMBLIES

A. Security and Detention Windows:
   1. Dimensions, profiles, features, and performance specified and indicated on drawings are required; do not deviate unless specifically approved by Architect under substitution procedures; see Section 01 60 00.

2. Design to fit openings indicated on drawings; design to accommodate deviation of actual construction from dimensions indicated on drawings.
3. Fabricate frames and sash with corners mitered or coped full depth with concealed welded joints.
4. Design anchorages to provide performance equivalent to that required for window unit; provide anchorages at least equivalent to those by which the tested units were anchored to the test frame.
5. Separate dissimilar metals to prevent corrosion by galvanic action by painting contact surfaces with primer or with sealant or tape recommended by manufacturer for the purpose.
6. Weld components before finishing and in concealed locations, to greatest extent possible; minimize distortion and discoloration of finish; remove residue of welding; grind exposed welds smooth and finish to match.
7. Label units to indicate which side is which, such as inside/outside or secure/non-secure; use labels that are removable after installation but durable enough not to be lost during delivery, storage, handling, and installation.

### 2.03 SECURITY TRANSACTION WINDOWS

A. Security Transaction Windows:
   1. Location: Built within interior wall, as indicated on drawings.
   2. Type of Use: As indicated on drawings.
   3. Ballistic Resistance: Tested to meet UL 752, Level 3.
   4. Window Type: Sliding, single horizontal.
      a. Mounting: Flush with the wall surface.
      b. Window Size: As indicated on drawings.
      c. Size of Counter Space: Manufacturer's standard size.
      d. Material: Stainless steel.
   5. Glazing: Single (monolithic), clear, and ballistic resistant.

### 2.04 ASSEMBLY COMPONENTS

A. Frame Anchors: Mild steel plates, shapes, or bars, concealed in completed construction; provide anchorage devices as necessary to securely fasten windows to adjacent construction; use security fasteners for exposed anchors.
   1. Provide minimum of two anchors per side of window plus one additional anchor for each 18 inches (457 mm) or fraction thereof more than 36 inches (915 mm) in height or width.

B. Glazing Seals: Factory installed; molded EPDM or neoprene compressible gaskets and compression strips.

C. Bituminous Paint: Cold-applied asbestos-free asphalt mastic, complying with SSPC-Paint 33; 30 mils, 0.030 inch (0.76 mm) minimum thickness per coat.

### 2.05 FINISHES

A. Polished Stainless Steel Finish:
   1. Polished as specified, without tool or die marks, stretch lines, or scratches, with grain running in long dimension of each piece.
   2. Passivated, rinsed, and chemically clean.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions and drawing details.

B. Install windows in correct orientation (inside/outside or secure/non-secure).

C. Anchor windows securely in manner so as to achieve performance specified.

D. Separate metal members from concrete and masonry using bituminous paint.

E. Set sill members and sill flashing in continuous bead of sealant.

### 3.02 ADJUSTING

A. Adjust operating components for smooth operation while also providing tight fit at contact points and a secure enclosure; lubricate operating hardware.

### 3.03 CLEANING

A. Clean exposed surfaces promptly after installation without damaging finishes.

B. Remove and replace defective work.

**END OF SECTION 08 56 53**

# SECTION 08 56 75
# SOUND CONTROL WINDOWS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Interview room sound control windows.

### 1.02 ABBREVIATIONS AND ACRONYMS

A. STC - Sound transmission Class

### 1.03 REFERENCE STANDARDS

A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's prdouct data.

C. Shop Drawings: Indicate fastening and sound attenuationdetails.

D. Certificate: Certify that products of this section meet or exceed specified requirements.

E. Test Reports: Unpon request, submit certified test reports from recognized test laboratories indicating units meet stated STC specified requirements.

F. Manufacturer's Instructions: Indicate installation instructions.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

B. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions and shop drawings.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Shipping:
   1. Glass shipped separately to avoid breakage.

B. Deliver material in the manufacturer’s original, unopened, undamaged containers with identification labels intact..

C. Store under cover and elevated above grade; protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer..

### 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Provide 2-year warranty commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with installer.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Basis of Design: Noise S.T.O.P. Soundproof Windows by Acoustical Surfaces Inc.; www.AcousticalSurfaces.com

B. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 SOUND CONTROL WINDOWS

A. Sound Control Window, Acoustical Surfaces, Inc.: Model Studio 6, STC Rating 56.
   1. https://www.acousticalsurfaces.com/acoustic_windows/acoustical_windows.htm
   2. STC rating: 56.
   3. 4 degree angled glass for max acoustical performance.
   4. Size (clear opening): As indicated on Drawing.
   5. Glazing: 1” insulated glass unit consists of 2 pieces of 1/4" laminated glass plus an air cavity and an additional pane of 3/8 " laminated glass.
      a. Options: One-way mirror and Safety glazing.
   6. Frame: 6-3/8" aluminum frame.

B. Window Frame:
   1. Finish: Select by Architect from manufacturer's standard selection.
   2. Angled glass for maximum acoustical performance.
   3. Acoustically treated frames and seals.
   4. Class A-1 ASTM E84 Nonflammable Sound Silencer™ acoustical frame insert.
   5. Fits any wall thickness by insetting or offsetting acoustical window.

## 2.03 ACCESSORIES

A. Fasteners: Stainless steel, size as recommended by manufacturer.

B. Acoustical Sealant: Type recommended by manufacturer.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Examine openings, substrates, anchorage, and conditions.

B. Immediately inspect shipment for damage during transit i.e., damage caused by fork lifts, stacking, water stains etc. and disclose to delivery driver prior to signing for receipt.

## 3.02 INSTALLATION

A. Install in accordance with manufacturer's written instructions.

B. Comply with the instructions and recommendations of the window manufacturer.

C. Installation manual is available from manufacturer’s website.

D. Snap in glass installation on job site.

## 3.03 ADJUSTING

A. Adjust hardware for smooth operation and secure acoustic closure.

## 3.04 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Remove protective material from factory finished aluminum surfaces.

C. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

D. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

E. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

## 3.05 PROTECTION

A. Protect installed units from subsequent construction operations.

**END OF SECTION 08 56 75**

**SECTION 08 71 00**
**DOOR HARDWARE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Hardware for wood and hollow metal doors.

B. Hardware for fire-rated doors.

C. Electrically operated and controlled hardware.

D. Thresholds.

E. Weatherstripping and gasketing.

### 1.02 RELATED REQUIREMENTS

A. Section 08 06 71 - Door Hardware Schedule: Schedule of door hardware sets.

B. Section 08 11 13 - Hollow Metal Doors and Frames.

C. Section 08 43 13 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.

D. Section 28 10 00 - Access Control: Electronic access control devices.

### 1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. BHMA A156.1 - Standard for Butts and Hinges; 2021.

C. BHMA A156.2 - Bored and Preassembled Locks and Latches; 2022.

D. BHMA A156.3 - Exit Devices; 2020.

E. BHMA A156.4 - Door Closers and Pivots; 2024.

F. BHMA A156.5 - Cylinders and Input Devices for Locks; 2020.

G. BHMA A156.6 - Standard for Architectural Door Trim; 2021.

H. BHMA A156.7 - Template Hinge Dimensions; 2016.

I. BHMA A156.13 - Mortise Locks & Latches Series 1000; 2022.

J. BHMA A156.15 - Release Devices - Closer Holder, Electromagnetic and Electromechanical; 2021.

K. BHMA A156.16 - Standard for Auxiliary Hardware; 2023.

L. BHMA A156.21 - Thresholds; 2019.

M. BHMA A156.22 - Standard for Gasketing; 2021.

N. BHMA A156.25 - Electrified Locking Devices; 2023.

O. BHMA A156.26 - Standard for Continuous Hinges; 2021.

P. BHMA A156.31 - Electric Strikes and Frame Mounted Actuators; 2024.

Q. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

R. ISO/IEC 14443-4 - Cards and Security Devices for Personal Identification – Contactless Proximity Objects – Part 4: Transmission Protocol - Amendment 1: Dynamic Power Level Management; 2018, with Amendment (2021).

S. ISO/IEC 15693-2 - Cards and Security Devices for Personal Identification - Contactless Vicinity Objects - Part 2: Air Interface and Initialization; 2019.

T. ITS (DIR) - Directory of Listed Products; Current Edition.

U. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

V. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

W. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

X. UL (DIR) - Online Certifications Directory; Current Edition.

Y. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

## 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
   1. Architect.
   2. Installer's Architectural Hardware Consultant (AHC).
   3. Hardware Installer.
   4. Owner's Security Consultant.

D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

## 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
   2. Provide complete description for each door listed.
   3. Provide manufacturer name, product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
   4. Include account of abbreviations and symbols used in schedule.

D. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
   2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
   3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

## 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

C. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

### 1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer's Warranty: Provide warranty against defects in material and workmanship for period indicated. Complete forms in Owner's name and register with manufacturer.
   1. Closers: Five years, minimum.
   2. Exit Devices: Three years, minimum.
   3. Locksets and Cylinders: Three years, minimum.
   4. Other Hardware: Two years, minimum.

## PART 2 PRODUCTS

### 2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:
   1. Applicable provisions of federal, state, and local codes.
   2. Accessibility: ADA Standards and ICC A117.1.
   3. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
   4. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
   5. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

D. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.
   1. See Section 28 10 00 for additional access control system requirements.

E. Fasteners:
   1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
      a. Aluminum fasteners are not permitted.
      b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
   2. Fire-Rated Applications: Comply with NFPA 80.
      a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
      b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

### 2.02 HINGES

A. Manufacturers:
   1. Basis of Design: Ives, 5BB Series; https://us.allegion.com/en/products/brands/ives.

2. McKinney; an Assa Abloy Group company: www.assaabloydss.com/#sle.
3. Hager Companies: www.hagerco.com/#sle.
4. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Hinges: Comply with BHMA A156.1, Grade 1.
1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
a. Provide hinge width required to clear surrounding trim.
2. Continuous Hinges: Comply with BHMA A156.26.
3. Provide hinges on every swinging door.
4. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
5. Provide ball-bearing hinges at each door with closer.
6. Provide non-removable pins on exterior outswinging doors.
7. Provide following quantity of butt hinges for each door:
a. Doors up to 60 inches (1.5 m) High: Two hinges.
b. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
c. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.
d. Doors over 120 inches (3 m) High: One additional hinge per each additional 30 inches (762 mm) in height.
e. Dutch Doors: Two hinges each leaf.
f. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
1) Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
2) Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
g. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
1) Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
2) Interior: Heavy weight, steel, 5 inches (127 mm) high
h. 2 inches or thicker doors:
1) Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
2) Interior: Heavy weight, steel, 5 inches (127 mm) high

C. Continuous Hinges
1. Manufacturers:
a. Basis of Design: Ives, Geared Continuous; https://us.allegion.com/en/products/brands/ives.
2. Requirements:
a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
e. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

**2.03 FLUSH BOLTS**

A. Manufacturers:
1. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle..
2. Adams Rite, an Assa Abloy Group company: www.assaabloydss.com/#sle.
3. Hager Companies: www.hagerco.com/#sle.
4. Pamex, Inc: www.pamexinc.com/#sle.
5. Trimco: www.trimcohardware.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Flush Bolts: Comply with BHMA A156.16, Grade 1.
   1. Flush Bolt Throw: 3/4 inch (19 mm), minimum.
   2. Provides extension bolts in leading edge of door, one bolt into floor, one bolt into top of frame.
      a. Pairs of Swing Doors: At inactive leaves, provide flush bolts of type as required to comply with code.
   3. Provide dustproof floor strike for bolt into floor, except at metal thresholds.
   4. Manual Flush Bolts: Provide lever extensions for top bolt at over-sized doors.

## 2.04 EXIT DEVICES

A. Manufacturers:
   1. Basis of Design: Von Duprin, an Allegion brand; 98/35A Series: www.allegion.com/us/#sle..
   2. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Hager Companies: www.hagerco.com/#sle.
   4. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Exit Devices: Comply with BHMA A156.3, Grade 1.
   1. Lever design to match lockset trim.
   2. Provide cylinder with cylinder dogging or locking trim.
   3. Provide exit devices properly sized for door width and height.
   4. Provide strike as recommended by manufacturer for application indicated.
   5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

## 2.05 WIRELESS EXIT TRIM

A. Manufacturer
   1. Basis of Design: Schlage, an Allegion brand; XE360 Series: www.allegion.com/us/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Mechanical Specifications

| | |
|---|---|
| Chasis | Exit ttrim, wide stile |
| Handing | On-site handing |
| ANSI standard (meets or exceeds) | ANSI/BHMA A156.13-2020 Grade 1 ANSI/BHMA A156.25-2023 Locked outdoor typeANSI/BHMA A156.5-2020 |
| Door thickness | 1-3/4 inches |
| Backset | Defined by exit device |
| Levers | Zinc |
| Stile Width | Minimum 4-1⁄4" (108mm) |
| Materials | All-metal chassis and escutcheon; exterior polycarbonate elements |
| Cylinder and keys | Schlage Classic C keyway, Conventional 6-pin cylinder with two keys |

C. Reader Specifications

| | |
|---|---|
| Credential Technologies | Smart (13.56 MHz), Bluetooth Low Energy (LE) (2.4 GHz), and Near Field Communication (NFC) |
| Standards | ISO/IEC 15693-2 and ISO/IEC 14443-4 |
| Read Range | Smart: up to .5 inches<br>Bluetooth Low Energy: up to 15 feet<br>NFC: mobile device dependent |
| Smart Credential Support | **Secure application area:** Schlage MIFARE Classic®, Schlage MIFARE® DESFire® EV1/EV2/EV3<br>**CSN only:** HID iCLASS®, HID iCLASS SE®, |

| | |
|---|---|
| | MIFARE Classic/DESFire |
| Mobile Credential Support | Schlage Mobile Bluetooth Credential, Integrated PACS mobile credential with Bluetooth, Apple Wallet® NFC student ID and employee badge; Google WalletTM NFC student ID and employee badge |

## 2.06 ELECTRIC STRIKES

A. Manufacturers:
   1. Adams Rite, HES, or Securitron; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Electric Strikes: Comply with BHMA A156.31, Grade 1.
   1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
   2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.
   3. Provide field selectable Fail Safe/Fail Secure modes.
   4. Provide transformer and rectifier as necessary for complete installation.
   5. Connect electric strikes into fire alarm where non-rated doors are scheduled to release with fire or sprinkler alarm condition.

## 2.07 LOCK CYLINDERS

A. Manufacturers:
   1. Basis of Design: Schlage, an Allegion brand; Conventional Series: www.allegion.com/us/#sle.
   2. Best, dormakaba Group: www.bestaccess.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
   1. Provide standard, electronic, and conventional type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
   2. Provide cylinders from same manufacturer as locking device.
   3. Provide cams and/or tailpieces as required for locking devices.

## 2.08 CYLINDRICAL LOCKS

A. Manufacturers:
   1. Basis of Design: Schlage, an Allegion brand; ND Series: www.allegion.com/us/#sle.
   2. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Best, dormakaba Group: www.bestaccess.com/#sle.
   4. Hager Companies: www.hagerco.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.
   1. Bored Hole: 2-1/8 inch (54 mm) diameter.
   2. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
   3. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
      a. Finish: To match lock or latch.
   4. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.

## 2.09 ELECTROMECHANICAL LOCKS

A. Manufacturers:
   1. Basis of Design: Schlage, an Allegion brand; NDE Wireless Series: www.allegion.com/us/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Electromechanical Locks: Comply with BHMA A156.25, Grade 1, Security, 1000 Series

1. Provide motor-driven or solenoid-driven locks, with strike that is applicable to frame.
2. Type: Cylindrical (Bored).

## 2.10 DOOR PULLS AND PUSH PLATES

A. Manufacturers:
1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Hager Companies: www.hagerco.com/#sle.
3. Hiawatha, Inc, division of Activar Construction Products Group, Inc: www.activarcpg.com/hiawatha/#sle.
4. Trimco: www.trimcohardware.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Door Pulls and Push Plates: Comply with BHMA A156.6.
1. Pull Type: Straight, unless otherwise indicated.
2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
   a. Edges: Beveled, unless otherwise indicated.
3. Material: Aluminum, unless otherwise indicated.

## 2.11 CLOSERS

A. Manufacturers; Surface Mounted:
1. Basis of Design: LCN 4000 and 1400 series; https://us.allegion.com/en/products/brands/lcn
2. Corbin Russwin, Norton, Rixson, Sargent, or Yale; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
3. Hager Companies: www.hagerco.com/#sle.
4. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Closers: Comply with BHMA A156.4, Grade 1.
1. Type: Surface mounted to door.
2. Provide door closer on each exterior door.
3. At outswinging exterior doors, mount closer on interior side of door.
4. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
5. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
6. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
7. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
8. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube
9. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
10. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
11. Pressure Relief Valve (PRV) Technology: Not permitted.
12. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard BHMA A156.4 A156.4 and ASTM B117, or has special rust inhibitor (SRI).
13. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer

mounting.

C. Manufacturers; Surface Mounted:
   1. Basis of Design: 4040XP and 1460 series; https://us.allegion.com/en/products/brands/lcn
   2. Corbin Russwin, Norton, Rixson, Sargent, or Yale; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   3. Hager Companies: www.hagerco.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.12 CLOSERS: COMPLY WITH BHMA A156.4, GRADE 1.**

A. Provide door closer on each exterior door.
   a. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
   b. Provide door closers with fully hydraulic, full rack and pinion action cast iron cylinder.
   c. Closer Body: 1-1/4-inch (32 mm) diameter, with 5/8-inch (16 mm) diameter heat-treated pinion journal.
   d. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
   e. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
   f. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
   g. Pressure Relief Valve (PRV) Technology: Not permitted.
   h. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

B. PROTECTION PLATES
   1. Manufacturers:
      a. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle.
      b. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
      c. Hager Companies: www.hagerco.com/#sle.
      d. Trimco: www.trimcohardware.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Protection Plates: Comply with BHMA A156.6.
   3. Metal Properties: Stainless steel material.
      a. Metal, Heavy Duty: Thickness 0.062 inch (1.57 mm), minimum.
   4. Edges: Beveled, on four sides unless otherwise indicated.
   5. Fasteners: Countersunk screw fasteners.

C. ARMOR PLATES
   1. Manufacturers:
      a. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle.
      b. Trimco: www.trimcohardware.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Armor Plates: Provide on bottom half of push side of doors that require protection from objects moving through openings that may damage door surface.
      a. Size: 16 inch (406 mm) high by 1-1/2 inch (38 mm) less door width (LDW) on pull side and 2 inch (51 mm) LDW on push side of door.

D. KICK PLATES
   1. Manufacturers:
      a. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle.
      b. Trimco: www.trimcohardware.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
    a. Size: 10 inch (254 mm) high by 2 inch (51 mm) less door width (LDW) on push side of door.

E. MOP PLATES
1. Manufacturers:
    a. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle.
    b. Trimco: www.trimcohardware.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.
2. Mop Plates: Provide along bottom edge of push side of doors to provide protection from cleaning liquids and equipment damage to door surface.
    a. Size: 12 inch (305 mm) high by 1-1/2 inch (38 mm) less door width (LDW) on pull side and 2 inch (51 mm) LDW on push side of door.

F. DOOR HOLDERS
1. Manufacturers:
    a. Basis of Design: Rockwood; an Assa Abloy Group company; OH900 Series: www.assaabloydss.com/#sle.
    b. McKinney; an Assa Abloy Group company: www.assaabloydss.com/#sle.
    c. Hager Companies: www.hagerco.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Door Holders: Comply with BHMA A156.16, Grade 1.
    a. Type: overhead holder, heavy duty.
    b. Material: Stainless steel.

G. ELECTROMAGNETIC DOOR HOLDERS
1. Manufacturers:
    a. Basis of Design: LCN SEM 7800 series; https://us.allegion.com/en/products/brands/lcn.
    b. Rixson or Sargent; an Assa Abloy Group company: www.assaabloydss.com/#sle.
    c. Hager Companies: www.hagerco.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Electromagnetic Door Holders: Comply with BHMA A156.15.
    a. Type: Wall mounted, single unit, standard duty, with strike plate attached to door.
    b. Holding Force, Standard Duty: 40 lbs-force (177 N), minimum.
    c. Voltage: 12 VDC, and provide power supplies by same manufacturer as holders.
    d. Provide interface with fire detectors and fire-alarm system for fire-rated door assemblies.

H. FLOOR STOPS
1. Manufacturers:
    a. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
    b. Hager Companies: www.hagerco.com/#sle.
    c. Trimco: www.trimcohardware.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Floor Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
    a. Type: Manual hold-open, with pencil floor stop.
    b. Material: Aluminum housing with rubber insert.

I. WALL STOPS
1. Manufacturers:
    a. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle.
    b. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
    c. Hager Companies: www.hagerco.com/#sle.
    d. Trimco: www.trimcohardware.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

2. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
   a. Type: Bumper, (concave or convex) .
   b. Material: Aluminum housing with rubber insert.

J. ASTRAGALS
1. Manufacturers:
   a. Basis of Design: Pemko; 357 Series, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   b. Hager Companies: www.hagerco.com/#sle.
   c. National Guard Products, Inc: www.ngpinc.com/#sle.
   d. Zero International, Inc: www.zerointernational.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.
2. Astragals: Comply with BHMA A156.22.
   a. Provide surface mounted astragal to cover or fill space for full door height between pair of doors or door and adjacent jamb.
   b. Type: Overlapping, flat type, with coordinator for proper door closing sequence, and with sealing gasket.
   c. Material: Aluminum, with neoprene weatherstripping.
   d. Provide non-corroding fasteners at exterior locations.

K. THRESHOLDS
1. Manufacturers:
   a. Basis of Design: Zero International, Inc: www.zerointernational.com/#sle.
   b. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   c. Hager Companies: www.hagerco.com/#sle.
   d. National Guard Products, Inc: www.ngpinc.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.
2. Thresholds: Comply with BHMA A156.21.
   a. Provide threshold at interior doors for transition between two different floor types, and over building expansion joints, unless otherwise indicated.
   b. Provide threshold at each exterior door, unless otherwise indicated.
   c. Type: Flat surface.
   d. Material: Aluminum.
   e. Threshold Surface: Fluted horizontal grooves across full width.
   f. Field cut threshold to profile of frame and width of door sill for tight fit.
   g. Provide non-corroding fasteners at exterior locations.

L. WEATHERSTRIPPING AND GASKETING
1. Manufacturers:
   a. Basis of Design: Zero International, Inc: www.zerointernational.com/#sle.
   b. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   c. Hager Companies: www.hagerco.com/#sle.
   d. National Guard Products, Inc: www.ngpinc.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.
2. Weatherstripping and Gasketing: Comply with BHMA A156.22.
   a. Head and Jamb Type: Encased in retainer.
   b. Door Sweep Type: Encased in retainer.
   c. Material: Aluminum, with neoprene weatherstripping.
   d. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
   e. Provide door bottom sweep on each exterior door, unless otherwise indicated.

M. COAT HOOKS
1. Manufacturers:

a. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.

2. Coat Hooks: Provide on room side of door, screw fastened.
3. Material: Brass.

N. SIGNAGE

1. Manufacturers:
   a. Basis of Design: Rockwood; an Assa Abloy Group company;BF689: www.assaabloydss.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Signage (Room Name Plates and Numbers): Provide on doors for individuals to easily identify room names and/or numbers.
   a. Text Required: as indicated on drawings.
   b. Material: In plastic or metal with paint used to create necessary text, adhered to door.

O. SILENCERS

1. Manufacturers:
   a. Basis of Design: Ives, an Allegion brand: www.allegion.com/us/#sle.: www.allegion.com/us/#sle.
   b. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   c. Substitutions: See Section 01 60 00 - Product Requirements.
2. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
   a. Single Door: Provide three on strike jamb of frame.
   b. Pair of Doors: Provide two on head of frame, one for each door at latch side.
   c. Material: Rubber, gray color.

P. WIRELESS ACCESS MANAGEMENT SYSTEMS

1. Manufacturers:
   a. Basis of Design: Schlage, an Allegion brand; ENGAGE Wireless Gateway System: www.allegion.com/us/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Wireless Access Management Systems: Comply with guidelines of BHMA A156.25, and including necessary hardware for fully functional system.
   a. Reader Formats: Provide magnetic stripe, proximity, dual validation, or key Fob to activate access system functionality.
   b. Door Locking Hardware: Provide applicable cylindrical locksets, panic hardware, or mortise locksets in compliance with project access control requirements.

Q. FIRE DEPARTMENT LOCK BOX

1. Manufacturers:
   a. Knox Company; Knox-Box Rapid Entry System, coordinate with AHJ: www.knoxbox.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Fire Department Lock Box:
   a. Heavy-duty, surface mounted, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers and tamper alarm.
   b. Capacity: Holds 10 keys.
   c. Finish: Manufacturer's standard dark bronze.

R. POWER SUPPLY

1. Power Supply: Hard wired, with multiple zones providing eight (8) breakers for each output panel with individual control switches and LED's; UL (DIR) Class 2 listed.
   a. Power: 12 VAC, 20 Amp; with 120 VAC power supply.
   b. Operating Temperature: 32 to 110 degrees F (0 to 43 degrees C).
   c. Provide with emergency release terminals that release devices upon activation of fire alarm system.

S. FINISHES
   1. Finishes: Identified in Section 08 0671 - Door Hardware Schedule.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

### 3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

C. Use templates provided by hardware item manufacturer.

D. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.

E. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

### 3.03 ADJUSTING

A. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

### 3.04 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

**END OF SECTION 08 71 00**

**SECTION 08 80 00**
**GLAZING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Glazing compounds.

### 1.02 RELATED REQUIREMENTS

A. See section 01 23 00 - Alternates.

B. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

C. Section 08 44 13 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.

### 1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).

D. ASTM C1036 - Standard Specification for Flat Glass; 2021.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

K. GANA (GM) - GANA Glazing Manual; 2022.

L. GANA (SM) - GANA Sealant Manual; 2008.

M. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

N. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

O. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

## 1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods. Maintain one copy on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

## 1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).

## 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

# PART 2 PRODUCTS

## 2.01 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   3. Glass thicknesses listed are minimum.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
   1. In conjunction with weather barrier related materials described in other sections, as follows:

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

## 2.02 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
   5. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.

6. Wired Glass Type: ASTM C1036, Type II - Wired Flat Glass, Quality - Q6, with color and performance characteristics as indicated.
7. Safety Wired Glass Type: ASTM C1036, Type II - Wired Flat Glass, Quality - Q5, complying with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I impact test requirements, and with color and performance characteristics as indicated.
8. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.

## 2.03 INSULATING GLASS UNITS

A. Manufacturers:
1. Cardinal Glass Industries: www.cardinalcorp.com/#sle.
2. Guardian Glass, LLC: www.guardianglass.com/#sle.
3. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.
4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Spacer Color: Black.
4. Edge Seal:
   a. Color: Black.
5. Purge interpane space with dry air, hermetically sealed.

## 2.04 BASIS OF DESIGN - INSULATING GLASS UNITS

A. Basis of Design - Insulating Glass Units: Vision glazing, with low-e coating.
1. Applications: Exterior insulating glass glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Total Thickness: 1 inch (25.4 mm).
4. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
5. Visible Light Transmittance (VLT): 70 percent, minimum.
6. Shading Coefficient: .44, maximum.
7. Solar Heat Gain Coefficient (SHGC): 0.39, maximum.
8. Visible Light Reflectance, Outside: 11 percent, maximum.
9. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
10. Spacer Color: Black.
11. Edge Seal:
12. Color: Black.
13. Purge interpane space with dry air, hermetically sealed.
14. Basis of Design - Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
15. Outboard Lite: Annealed float glass, 1/4 inch (6.4 mm) thick, minimum.
    a. Low-E Coating: Vitro Architectural Glass (formerly PPG Glass) Solarban 60 on #2 surface.
    b. Glass Tint: Solargray (light-gray).
16. Inboard Lite: Heat-strengthened float glass, 1/4 inch (6.4 mm) thick.
    a. Coating: No coating on inboard lite.

b. Glass: Clear.

## 2.05 GLAZING UNITS

A. Type G-14 - One-way-vision laminated glass with precision dot-on-dot printing interlayer.
   1. Applications: Locations as indicated on drawings.
   2. Functionality: Appearance of an image when viewed from outside, that is not visible when viewed from inside.
   3. Overall Thickness: As required to meet performance criteria.
   4. Images: As indicated on drawings.
   5. Composition: Manufacturer's standard.
      a. Outer Pane: Annealed glass.
         1) Tint: Clear.
      b. Interlayer: Polyvinyl butyral (PVB), thickness as required to meet performance criteria.
      c. Inner Pane : Annealed glass.
   6. Printed Pattern: Provide pattern resulting in acceptable avoidance index score from American Bird Conservancy for different sizes and species of birds.
      a. Score: 25.
   7. Fabricators:
      a. McGrory Glass Inc; DotView by McGrory Glass: www.mcgrory.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.06 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) by width of glazing rabbet space minus 1/16 inch (1.5 mm) by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
   1. Width: As required for application.
   2. Thickness: As required for application.
   3. Spacer Rod Diameter: As required for application.

# PART 3 EXECUTION

## 3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

## 3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

## 3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in

glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

### 3.04 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

### 3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

**END OF SECTION 08 80 00**

## SECTION 08 87 23
## SAFETY AND SECURITY FILMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Glazing film applied to new glazing assemblies.

B. New Glazing: Factory or shop install film to glazing before installation in frames.

### 1.02 RELATED REQUIREMENTS

A. Section 08 44 13 - Glazed Aluminum Curtain Walls: New glazing to receive film.

### 1.03 ABBREVIATIONS AND ACRONYMS

### 1.04 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

C. GSA TS01 - Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings; General Services Administration; 2003.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Record of product certification for safety requirements.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

C. Shop Drawings: Detailing installation of film, anchoring accessories, and sealant.

D. Samples: For each film product to be used, minimum size 4 inches (102 mm) by 6 inches (152 mm), representing actual product, color, and patterns.

E. Samples, Supplemental Anchors: Where supplemental anchors are necessary to achieve specified performance submit detailed information in accordance with substitution procedures; include two samples, minimum length 2 inches (51 mm).

F. Test Reports: Detailed reports of full-scale chamber tests to specified criteria, using assemblies identical to those required for this project.

G. Specimen Warranty.

### 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Glazing film manufacturer specializing in manufacture of safety glazing films with minimum 10 years successful experience.

B. Installer Qualifications: Certified by glazing film manufacturer.

### 1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

### 1.08 WARRANTY

A. Provide 10 year manufacturer's replacement warranty to cover film against peeling, cracking, discoloration, and deterioration.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. 3M Window Film: www.solutions.3m.com/#sle.

B. Avery Dennison: www.averydennison.com/#sle.

C. Flexvue Films: www.flexvuefilms.com/#sle.

D. Impact Security, LLC: www.defenselite.com/#sle.

E. Madico, Inc: www.madico.com/#sle.

F. XPEL, Inc: www.xpel.com/#sle.

G. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 SAFETY AND SECURITY GLAZING FILM

A. Blast Resistant Glazing at Ground Level: Provide new glazing assemblies to provide Level 2 blast resistance when tested in accordance with GSA TS01 at a peak pressure of ___ psi (___ kPa), and a positive phase impulse of ____; and impact resistance complying with ANSI Z97.1 and 16 CFR 1201, Category II, as specified.
   1. 1/4 inch (6 mm) thick clear annealed glass.
   2. Surface applied film.

### 2.03 MATERIALS

A. Glazing Film: Transparent polyester film for permanent bonding to glass.
   1. Thickness: 0.008 inch (0.2 mm), minimum.
   2. Color: Clear.

**END OF SECTION 08 87 23**

**SECTION 09 21 16**
**GYPSUM BOARD ASSEMBLIES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Metal channel ceiling framing.

D. Gypsum sheathing.

E. Cementitious backing board.

F. Gypsum wallboard.

G. Joint treatment and accessories.

H. Acoustic (sound-dampening) wall and ceiling board.

I. Noise barriers in gypsum board assemblies.

J. Bullet resistant sheathing and wallboard.

### 1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Structural steel stud framing.

B. Section 07 21 00 - Thermal Insulation: Acoustic insulation.

C. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.

D. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

### 1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).

B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.

C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

D. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.

E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

F. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

I. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

L. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

M. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

N. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

O. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.

P. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.

Q. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

R. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

S. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

T. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.

U. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018 (Reapproved 2023).

V. ASTM C1288 - Standard Specification for Fiber-Cement Interior Substrate Sheets; 2023.

W. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).

X. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

Y. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Editorial Revision (2020).

Z. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

AA. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

BB. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

CC. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.

DD. ASTM E413 - Classification for Rating Sound Insulation; 2022.

EE. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

FF. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

GG. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

## 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

B. Sequencing: Install service utilities in an orderly and expeditious manner.

## 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Steel Framing Industry Association (SFIA) Certification:
   1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.

D. Ballistic Test Reports: Indicate compliance of bullet-resistant sheathing and wallboard assemblies with specified requirements.

**1.06 QUALITY ASSURANCE**

A. SFIA Code Compliance Certification Program: www.CFSteel.org/#sle: Use metal studs and connectors certified for compliance with International Building Code.

B. Manufacturer Qualifications: Member of Supreme Steel Framing System Association (SSFSA): www.ssfsa.com/#sle.

C. Documents at Project Site: Maintain at the project site a copy of manufacturer's instructions, erection drawings, and shop drawings.

**1.07 DELIVERY, STORAGE, AND HANDLING**

A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

B. Store metal products to prevent corrosion.

**PART 2 PRODUCTS**

**2.01 GYPSUM BOARD ASSEMBLIES**

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
   1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft (0.24 kPa) with maximum mid-span deflection of L/240.
   2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

D. Shaft Walls at Elevator Shafts: Provide completed assemblies with the following characteristics:
   1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft (0.24 kPa) with maximum mid-span deflection of L/240.
   2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

E. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions in accordance with ASCE 7 for Seismic Design Category D, E, or F and complying with the following:
   1. Local authorities having jurisdiction.

F. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:

**2.02 METAL FRAMING MATERIALS**

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
   1. Structural Grade: As required to meet design criteria.

B. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. Jaimes Industries: www.jaimesind.com/#sle.

3. MarinoWARE: www.marinoware.com/#sle.
4. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
5. R-stud: www.rstud.com/#sle.
6. SCAFCO Corporation: www.scafco.com/#sle.
7. Steel Construction Systems: www.steelconsystems.com/#sle.
8. Substitutions: See Section 01 60 00 - Product Requirements.

C. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
1. Studs: C-shaped with knurled or embossed faces.
   a. Gauge: 25g U.N.O.
2. Runners: U shaped, sized to match studs.
3. Ceiling Channels: C-shaped.
4. Flexible Track: Flexible framing consisting of adjustable leg straps and pivoting, hinged track brackets designed to provide curved framing assemblies of varying radii.
5. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
6. Furring Members: U-shaped sections, minimum depth of 3/4 inch (19 mm).
7. Furring Members: Zee-shaped sections, minimum depth of 1 inch (25 mm).
8. Resilient Furring Channels: Single or double leg configuration; 1/2 inch (13 mm) channel depth.

D. Shaft Wall Studs and Accessories: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
1. Products:
   a. Same manufacturer as other framing materials.

E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-resistance rating of the wall assembly.
   a. Products:
      1) ClarkDietrich: www.clarkdietrich.com/#sle.
      2) MBA Building Supplies; Slotted Slip Track: www.mbastuds.com/#sle.
      3) Metal-Lite, Inc; The System: www.metal-lite.net/#sle.
      4) Super Stud Building Products, Inc: www.buysuperstud.com/#sle.
      5) Substitutions: See Section 01 60 00 - Product Requirements.

F. Non-structural Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
   a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
   b. Height: as indicated on drawing.
   c. Products:
      1) ClarkDietrich; Pony Wall (PW): www.clarkdietrich.com/#sle.
      2) Simpson Strong-Tie; RCKW Kneewall Connector: www.strongtie.com/#sle.
      3) Substitutions: See Section 01 60 00 - Product Requirements.

3. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.
4. Blocking for ADA accessories, cabinets, counter brackets, wall mounted handrails and where indicated on the drawings, contractors option:
    a. Flush-Mount Backing, 16g - .059 inch thick; 16" stud spacing.
        1) ADA Compliant
            (a) Manufacturer: Metal-Lite; www.metal-lite.net
    b. Fire rated wood blocking.
    c. Sheet Metal Backing: 16g - .059" thick, galvanized.
5. Fasteners: ASTM C1002 self-piercing tapping screws.
6. Anchorage Devices: Powder actuated.

G. Grid Suspension Systems: Steel grid system of main tees and support bars connected to structure using hanging wire.
1. Products:
    a. CertainTeed Corporation: www.certainteed.com/ceilings-and-walls/#sle.
    b. USG Corporation; Drywall Suspension System: www.usg.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

**2.03 BOARD MATERIALS**

A. Manufacturers - Gypsum-Based Board:
1. American Gypsum Company: www.americangypsum.com/#sle.
2. CertainTeed Corporation: www.certainteed.com/#sle.
3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
4. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
5. PABCO Gypsum: www.pabcogypsum.com/#sle.
6. USG Corporation: www.usg.com/#sle.
7. Substitutions: See Section 01 60 00 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
3. Unfaced fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
5. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
6. Thickness:
    a. Vertical Surfaces: as indicated on drawings.
    b. Ceilings: as indicated on drawings.
    c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

C. Abuse Resistant Wallboard:
1. Application: _____.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Type: Fire-resistance-rated Type X, UL or WH listed.
4. Thickness: as indicated on drawings.
5. Edges: Tapered.

D. Backing Board For Wet Areas: One of the following products:

1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
2. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
    a. Thickness: as indicated on drawings.
    b. Products:
        1) Custom Building Products: www.custombuildingproducts.com/#sle.
        2) PermaBASE Building Products, LLC provided by National Gypsum Company; PermaBase Cement Board: www.goldbondbuilding.com/#sle.
        3) Substitutions: See Section 01 60 00 - Product Requirements.
3. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
    a. Thickness: as indicated on drawings.
    b. Products:
        1) James Hardie Building Products, Inc: www.jameshardie.com/#sle.
        2) Substitutions: See Section 01 60 00 - Product Requirements.

E. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
3. Type: Regular and Type X, in locations indicated.
4. Type X Thickness: 5/8 inch (16 mm)as indicated on drawings.
5. Regular Board Thickness: as indicated on drawings.
6. Edges: Tapered.
7. Products:
    a. American Gypsum Company; M-Bloc: www.americangypsum.com/#sle.
    b. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board: www.gpgypsum.com/#sle.
    c. Georgia-Pacific Gypsum; DensArmor Plus: www.gpgypsum.com/#sle.
    d. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

F. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: as indicated on drawings.
3. Edges: Tapered.
4. Products:
    a. CertainTeed Corporation; Interior Ceiling Drywall: www.certainteed.com/#sle.
    b. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond High Strength LITE Gypsum Board: www.goldbondbuilding.com/#sle.
    c. USG Corporation; Sheetrock Brand UltraLight Panels: www.usg.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

G. Acoustical Sound Dampening Wall and Ceiling Board: Two layers of heavy paper-faced, high-density gypsum board separated by a viscoelastic polymer layer and capable of achieving STC rating of 50 or more in typical stud wall assemblies as calculated in accordance with ASTM E413 and when tested in accordance with ASTM E90.
1. Thickness: as indicated on drawings.
2. Long Edges: Tapered.
3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
4. Products:

a. CertainTeed Corporation; SilentFX Quick Cut Gypsum Board: www.certainteed.com/#sle.
b. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond SoundBreak XP Wall Board: www.goldbondbuilding.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

H. Bullet Resistant Sheathing and Wallboard: Woven roving, multi-ply, ballistic grade fiberglass cloth with thermoset polyester resin; comply with UL 752 Level 3.
1. Thickness: as indicated on drawings.
2. In 1-Hour Fire-Resistance-Rated Partitions: UL listed for assembly used.
3. Products:
a. ArmorCore by Waco Composites; Bullet Resistant Fiberglass Panels: www.armorcore.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.

I. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Fungal Resistance: No fungal growth when tested in accordance with ASTM G21.
4. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
5. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
6. Core Type: Regular and Type X, as indicated.
7. Type X Thickness: 5/8 inch (16 mm).
8. Regular Board Thickness: as indicated on drawings.
9. Edges: Square.
10. Glass Mat Faced Products:
a. American Gypsum Company; M-Glass Exterior Sheathing : www.americangypsum.com/#sle.
b. CertainTeed Corporation; GlasRoc Exterior Sheathing: www.certainteed.com/#sle.
c. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.
d. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Fire-Shield Sheathing: www.goldbondbuilding.com/#sle.
e. USG Corporation; Securock ExoAir 430 Panel USGX: www.usg.com/#sle.
f. Substitutions: See Section 01 60 00 - Product Requirements.

J. Shaftwall and Coreboard: Type X; 1 inch (25 mm) thick by 24 inches (600 mm) wide, beveled long edges, ends square cut.
1. Paper-Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Paper-Faced Products:
a. American Gypsum Company; M-Bloc Shaft Liner: www.americangypsum.com/#sle.
b. CertainTeed Corporation; M2Tech Type X Shaftliner: www.certainteed.com/#sle.
c. Georgia-Pacific Gypsum; ToughRock Shaftliner: www.gpgypsum.com/#sle.
d. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond Shaftliner XP: www.goldbondbuilding.com/#sle.
e. USG Corporation; Sheetrock Brand Mold Tough Gypsum Liner Panels 1 in. (25.4 mm) SLX: www.usg.com/#sle.
f. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: See Section 07 21 00.

B. Acoustical Shielding: Mass loaded vinyl (MLV) sheet membrane; applied between studs and RC channels.

1. Sound Transmission Class (STC): Minimum of 26, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
2. Flammability rating of class 1 per ASTM E84 Rev. A, behind minimum 3/8" drywall.
3. No fungal or algal growth and no visible disfigurement per ASTM D3273 and ASTM G21.
4. Products:
    a. Acoustical Solutions, LLC, AudioSeal® Mass Loaded Vinyl (MLV) Soundproofing Barrier: www.acousticalsolutions.com/
    b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.
1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
2. Tape Thickness: 1/4 inch (6 mm).
3. Products:
    a. Armacell LLC; ArmaComfort MTD: www.armacell.us/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
1. Products:
    a. Franklin International, Inc; Titebond Acoustical Smoke & Sound Sealant: www.titebond.com/#sle.
    b. Liquid Nails, a brand of PPG Architectural Coatings: www.liquidnails.com/#sle.
    c. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Acoustic putty: Sound isolation for penetrations.
1. Acoustical putty pads designed to maintain the performance of acoustically rated walls with penetrating items such as electrical outlets, HVAC ducts, water hookups, and cables.
2. Putty Thickness: 1/8 inch (3 mm).
3. Products:
    a. ATS Acoustical; Acoustic Putty Pads: www.atsacoustics.com.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

F. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
1. Corner Beads: Low profile, for 90 degree outside corners.
    a. Products:
        1) CertainTeed Corporation; No-Coat Drywall Corner: www.certainteed.com/#sle.
        2) ClarkDietrich; Strait-Flex OS-300: www.clarkdietrich.com/#sle.
        3) Flannery, Inc; Corner Beads: www.flannerytrim.com/#sle.
        4) Trim-Tex, Inc: www.trim-tex.com/#sle.
        5) Substitutions: See Section 01 60 00 - Product Requirements.
2. L-Trim with Tear-Away Strip: Sized to fit 1/2-inch (13 mm) thick gypsum wallboard.
3. Architectural Reveal Beads:
    a. Shapes: As indicated on drawings.
    b. Products:
        1) Flannery, Inc; Architectural Reveal Beads: www.flannerytrim.com/#sle.
        2) Phillips Manufacturing Co; J-400 Reveal Trim: www.phillipsmfg.com/#sle.
        3) Trim-Tex, Inc: www.trim-tex.com/#sle.
        4) Substitutions: See Section 01 60 00 - Product Requirements.

G. Extruded Aluminum Partition Closure
1. System description

a. Window Mate – Series 40 Plus extruded aluminum partition closures are pre-assembled and spring loaded to provide a tight fit for vertical junctures of partitions and window walls. Mullion Mate is finished to match mullions in a spray applied water- borne cross-linked baked acrylic finish or Acrylic-Polyester hybrid powder coat paint finish or custom paints or anodized finish. They are sound tested to a composite STC of 56 with acoustical batts for sound attenuation.
b. Products:
1) Gordon Architectural Engineered Solutions: www.gordon-inc.com.
2) Substitutions: See Section 01 60 00 - Product Requirements.

2. Materials:
a. Aluminum extrusions: 6063-T5 temper, tensile strength 31 KSI ASTM B221; ASTM B221M.
b. Acoustical Batts for sound attenuation (as specified). **Factory-supplied caulk must be installed** in the field for acoustical performance purposes.
c. Accessories:
1) Window Mate End Caps:
d. General: Provide metals free from surface blemishes where exposed to view in finished unit. Surfaces that exhibit pitting, seam marks, roller marks, stains, and discolorations, or other imperfections on finished units are not acceptable. All metal shall be of the highest-grade commercial type.
e. Fabrication:
1) Provide extruded aluminum WINDOW MATE – SERIES 40 PLUS in specified lengths and size to fit specified openings.
f. Finish: Selected by Architect from manufacturer's full range of finishes.

H. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Fiberglass Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
2. Paper Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
3. Joint Compound: Drying type, vinyl-based, ready-mixed.
4. Joint Compound: Setting type, field-mixed.

I. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

J. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

### 3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
1. Install studs at spacing required to meet performance requirements.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

### 3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C1007AISI S220 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

C. Studs: Space studs at 16 inches on center (at 406 mm on center).

1. Extend partition framing to structure where indicated and to ceiling in other locations.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Acoustic Furring: Install resilient channels at maximum 24 inches (600 mm) on center. Locate joints over framing members.

**3.04 ACOUSTIC ACCESSORIES INSTALLATION**

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

C. Acoustic Sealant: Install in accordance with manufacturer's instructions.

D. Acoustical Shielding: Install in accordance with manufacturer's instructions for application between studs and RC channel.
1. Mass Loadded Vinyl (MLV)
   a. Attach directly to the RC channel using pan head screws.
   b. A screw every 12" is recommended along the top.
   c. Straighten MLV Soundproofing Barrier so it is flush against the RC channel.
   d. Using drywall screws, attach MLV Soundproofing Barrier to the RC channel in the middle of the stud.
   e. Only one fastener is required for each vertical stud.
   f. NOTE: High Walls - see manufactuere's instructions.

**3.05 BOARD INSTALLATION**

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

C. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.

D. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

E. Bullet Resistant Sheathing and Wallboard:
1. Install bullet-resistant sheathing according to manufacturer's written recommendations and with manufacturer-approved fasteners.
2. Cover all joints between boards with a 4-inch (100 mm) strip of the same thickness material as the boards, centered on the joint.

**3.06 JOINT TREATMENT**

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
2. Level 3: Walls to receive textured wall finish.
3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
4. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

**3.07 TOLERANCES**

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

**END OF SECTION 09 21 16**

**SECTION 09 30 00**
**TILING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Non-ceramic trim.

### 1.02 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2023.

B. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.

F. ANSI A108.5 - Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry-Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar; 2023.

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 2023.

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2024).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2023.

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).

K. ANSI A108.12 - Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Modified Dry-Set Mortar; 2023.

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).

M. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.

N. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.

O. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.

P. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.

Q. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.

R. ANSI A136.1 - American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile; 2020.

S. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.

T. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).

U. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2024.

V. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

**1.03 ADMINISTRATIVE REQUIREMENTS**

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

**1.04 SUBMITTALS**

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

**1.05 QUALITY ASSURANCE**

**1.06 DELIVERY, STORAGE, AND HANDLING**

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

**1.07 FIELD CONDITIONS**

**PART 2 PRODUCTS**

**2.01 TILE**

A. Glazed Wall Tile: ANSI A137.1 standard grade.
   1. Size: as indicated on drawings finish schedule, nominal.
   2. Edges: Cushioned.
   3. Surface Finish: Matte glaze.
   4. Color(s): As indicated on drawings.
   5. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.
   6. Products:
      a. Architessa: www.architessa.com/#sle.
      b. Basis of Design: Dal-Tile Corporation; _____: www.daltile.com/#sle.
      c. American Olean Corporation: www.americanolean.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Porcelain Tile: ANSI A137.1 standard grade.
   1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
   2. Size: 24 x 24 inch (610 x 610 mm), nominal.
   3. Thickness: 3/8 inch (9.5 mm).
   4. Surface Finish: Unglazed.
   5. Color(s): As indicated on drawings.
   6. Trim Units: Matching bullnose, cove base, and cove shapes in sizes coordinated with field tile.
   7. Products:
      a. Basis of Design: Porcelanosa, Newport: www.porcelanosa.com
      b. Architessa: www.architessa.com/#sle.
      c. Dal-Tile Corporation: www.daltile.com/#sle.
      d. Florim USA: www.milestonetiles.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, set with tile mortar or adhesive.
   1. Applications:
      a. Open edges of wall and floor tile.
      b. Inside and outside wall corners.
      c. Transition between floor finishes of different heights.
      d. Floor and wall expansion and control joints.
      e. Floor-to-wall joints.
      f. Borders and other trim as indicated on drawings.
   2. Products:
      a. Blanke Corporation: www.blankecorp.com/#sle.
      b. Genesis APS International: www.genesis-aps.com/#sle.
      c. LATICRETE International, Inc: www.laticrete.com/#sle.
      d. Basis of Design: Schluter-Systems: www.schluter.com/#sle.
         1) Edge-protection and transition profiles for floors:
            (a) Item: Schluter-SCHIENE; L-shaped, Schluter-DECO, Schluter-RENO-T, Schluter-RENO-TK, Schluter-RENO-U, Schluter-RENO-RAMP-K, and Schluter-RENO-RAMP.
         2) Edge-protection and transition profiles for walls and countertops:
            (a) Item: Schluter-SCHIENE; L shaped, Schluter-QUADEC, and Schluter-RONDEC-STEP.
         3) Finishing and edge protection profiles for stair nosings:
            (a) Item: Schluter-RONDEC-STEP, Schluter-TREP-E/EK, Schluter-TREP-SE-S-B, Schluter-TREP-G/-GK, Schluter-TREP-EFK, Schluter-SCHIENE-STEP, Schluter-TREP-FL, and Schluter-TREP-TAP.
            (b) Provide with matching corners.
         4) Moverment joints and cove-shaped profiles:
            (a) Item: Schluter-DILEX-BWS, Schluter-DILEX-BWB, Schluter-DILEX-EKSB, Schluter-DILEX-AS, Schluter-DILEX-HK, and Schluter-DILEX-HKS.
            (b) Provide with matching corners, end caps and connectors.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.03 SETTING MATERIALS

A. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. Custom Building Products: www.custombuildingproducts.com/#sle.
   3. Basis of Design: LATICRETE International, Inc: www.laticrete.com/#sle.
   4. Mapei Corporation: www.mapei.com/#sle.
   5. Schluter-Systems: www.schluter.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Organic Adhesive: ANSI A136.1, thinset mastic type.
   1. Use Type I in areas subject to prolonged moisture exposure.
   2. Products:
      a. ARDEX Engineered Cements; ARDEX D14: www.ardexamericas.com/#sle.
      b. Custom Building Products; ReliaBond Ceramic Tile Adhesive - Type 1: www.custombuildingproducts.com/#sle.
      c. LATICRETE International, Inc; LATICRETE 15 Premium Mastic: www.laticrete.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Water Based Adhesive: Multi-purpose type mastic.

1. Type as recommended by manufacturer.

## 2.04 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. Basis of Design: LATICRETE International, Inc: www.laticrete.com/#sle.
   3. Mapei Corporation: www.mapei.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standard Grout: ANSI A118.6 standard cement grout.
   1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
   2. Use sanded grout for joints 1/8 inch (3.2 mm) wide and larger; use unsanded grout for joints less than 1/8 inch (3.2 mm) wide.
   3. Color(s): As indicated on drawings.

D. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Applications: Where indicated.
   2. Color(s): As indicated on drawings.

## 2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
   1. Applications: Between tile and plumbing fixtures.
   2. Products:
      a. Basis ofLATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
   1. Composition: Water-based colorless silicone.
   2. Products:
      a. Basis of Design: STONETECH, a Division of LATICRETE International, Inc; STONETECH Heavy Duty Grout Sealer: www.laticrete.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.06 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Crack Resistance: No failure at 1/8 inch (3.2 mm) gap, minimum.
   2. Bonded Sheet Membrane Type:
      a. Material: Polyethylene sheet membrane with polyester fleece laminated to underside, 20 mils (0.5 mm) thick.
      b. Products:
         1) Schluter-Systems; DITRA: www.schluter.com/#sle.
         2) Substitutions: See Section 01 60 00 - Product Requirements.

B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
   1. Bonded Sheet Membrane Type:
      a. Material: Polyethylene vinyl acetate (PEVA) core with nonwoven polypropylene laminated to both sides, 8 mils (0.2 mm) thick.
      b. Products:
         1) Schluter-Systems; KERDI: www.schluter.com/#sle.
         2) Substitutions: See Section 01 60 00 - Product Requirements.

C. Waterproof building panel for ceramic and stone tile; Schluter-KERDI-BOARD
   1. Panel Thickness: 1/2" and 5/8".

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

### 3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

### 3.03 INSTALLATION - GENERAL

A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

### 3.04 INSTALLATION - WALL TILE

A. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

### 3.05 CLEANING

A. Clean tile and grout surfaces.

### 3.06 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION 09 30 00**

## SECTION 09 51 00
## ACOUSTICAL CEILINGS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

### 1.02 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2022.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning.

C. Product Data: Provide data on suspension system components and acoustical units.

D. Samples: Submit two samples 4 by 6 inch (101.6 by 152.4 mm) minimum, in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 6 inches (152.4 mm) minimum, long, of suspension system main runner, cross runner, and perimeter molding.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

### 1.05 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

### 1.06 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc; Ultima 1902: www.armstrongceilings.com/#sle.
   2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
   3. USG Corporation: www.usg.com/ceilings/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems:

1. Armstrong World Industries, Inc; Prelude XL 9/16": www.armstrongceilings.com/#sle.
2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
3. USG Corporation: www.usg.com/ceilings/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 PERFORMANCE REQUIREMENTS**

**2.03 ACOUSTICAL UNITS**

A. Acoustical Panels Ultima 1902: Mineral fiber with membrane-faced overlay, with the following characteristics:
   1. Classification: ASTM E1264 Type IV.
   2. Size: 24 by 24 inches (610 by 610 mm).
   3. Thickness: 3/4 inch (19 mm).
   4. Light Reflectance: 88 percent, determined in accordance with ASTM E1264.
   5. NRC Range: .75 to N/A, determined in accordance with ASTM E1264.
   6. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
   7. Panel Edge: Beveled Tegular, 9/16".
   8. Color: White.
   9. Suspension System Type 9/16" Heavy Duty: Exposed grid.
   10. Products:
      a. Armstrong World Industries, Inc; Suprafine XL 9/16" Heavy Duty: www.armstrongceilings.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.04 SUSPENSION SYSTEM(S)**

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, clips, and splices as required.

**2.05 ACCESSORIES**

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch (2 mm) galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

**3.02 PREPARATION**

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

**3.03 INSTALLATION - SUSPENSION SYSTEM**

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

D. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

G. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.

H. Do not eccentrically load system or induce rotation of runners.

**3.04 INSTALLATION - ACOUSTICAL UNITS**

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

**3.05 TOLERANCES**

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

**3.06 CLEANING**

A. Clean surfaces.

B. Replace damaged or abraded components.

**END OF SECTION 09 51 00**

**SECTION 09 65 00**
**RESILIENT FLOORING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Static control resilient tile flooring.

C. Resilient base.

D. Resilient stair accessories.

E. Installation accessories.

### 1.02 REFERENCE STANDARDS

A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers; 1998 (Reapproved 2023).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.

C. ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring; 2006 (Reapproved 2018).

D. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2020.

E. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.

F. ASTM F2169 - Standard Specification for Resilient Stair Treads; 2015 (Reapproved 2020).

G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

H. UL 2824 - GREENGUARD Certification Program Method for Measuring Microbial Resistance from Various Sources Using Static Environmental Chambers; Current Edition, Including All Revisions.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Shop Drawings: Indicate seaming plans and floor patterns.

D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

D. Do not double stack pallets.

**1.06 FIELD CONDITIONS**

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

**PART 2 PRODUCTS**

**2.01 TILE FLOORING**

A. Vinyl Tile - Luxury Vinyl Tile: Surface-decorated, with wear layer.
   1. Manufacturers:
      a. Basis of Design: Milliken Floor Covering: milliken.com
      b. Armstrong Flooring: www.armstrongflooring.com/#sle.
      c. Flexco Corporation: www.flexcofloors.com/#sle.
      d. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
      e. LG Hausys America, Inc; : www.lghausysusa.com/#sle.
      f. Mannington Commercial: www.manningtoncommercial.com#sle.
      g. Metroflor Corporation: www.aspectaflooring.com/#sle.
      h. Roppe Corporation: www.roppe.com/#sle.
      i. Shannon Specialty Floors, Inc: www.shannonspecialtyfloors.com/#sle.
      j. TAJ Flooring: www.tajflooring.com/#sle.
      k. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   4. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329; certified in accordance with UL 2824.
   5. Style: as indicated on drawings and finish schedule.
   6. Pattern: as indicated on drawings and finish schedule.
   7. Color: as indicated on drawings and finish schedule.

B. Static Control Tile: Homogeneous; color and pattern throughout thickness.
   1. Manufacturers:
      a. Basis of Design: StaticWorx; Ameriwox ESD Slid Vinyl Tile: www.staticworx.com.
      b. Armstrong Flooring, Inc; Excelon ESD, Static Control VCT: www.armstrongflooring.com/#sle
      c. Flexco Corporation; Delane ESD Vinyl: www.flexcofloors.com/#sle.
      d. Mannington Commercial: www.manningtoncommercial.com#sle.
      e. Roppe Corporation; ESD Vinyl Static Control Tile: www.roppe.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Minimum Requirements: Solid vinyl tile complying with ASTM F1700, Class 1, Type A.
   3. Electrical Resistance:
      a. Conductive Tile: Resistance between 25 kiloohms and 1.0 megohms as tested in accordance with ASTM F150.
      b. Dissipative Tile: Resistance between 1.0 megohms and 1000 megohms as tested in accordance with ASTM F150.
   4. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   5. Tile Size: 12 by 12 inch (305 by 305 mm).
   6. Total Thickness: 0.125 inch (3 mm).
   7. Pattern: as indicated on drawings.
   8. Color: As indicated on drawings.

## 2.02 STAIR COVERING

A. Stair Treads: Rubber with interwoven synthetic fibers; full width and depth of stair tread in one piece; tapered thickness.
   1. Manufacturers:
      a. Mannington Commercial: www.manningtoncommercial.com#sle.
      b. Basis of Design: Roppe Corporation; Rubber Treads With DuPont Kevlar: www.roppe.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F2169, Type TS, rubber, vulcanized thermoset, Grade 1.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with {\rs\#1} or {\rs\#1}.
   4. Nominal Thickness: 0.1875 inch (4.75 mm).
   5. Nosing: Square.
   6. Texture: Smooth.
   7. Pattern: _____.
   8. Color: As indicated on drawings.

B. Stair Risers: Full height and width of tread in one piece, matching treads in material and color.
   1. Manufacturers:
      a. Mannington Commercial; _____: www.manningtoncommercial.com#sle.
      b. Roppe Corporation; _____: www.roppe.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Thickness: 0.080 inch (2.0 mm).

## 2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS, rubber, vulcanized thermoset; style as scheduled.
   1. Manufacturers:
      a. Flexco Corporation: www.flexcofloors.com/#sle.
      b. Basis of Design: Johnsonite, a Tarkett CompanyMillwork Resilient Wall Base: www.johnsonite.com/#sle.
      c. Flexco Corporation: www.flexcofloors.com/#sle.
      d. Mannington Commercial: www.manningtoncommercial.com#sle.
      e. Roppe Corporation: www.roppe.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   3. Style: as idicated on drawings and finish schedule.
   4. Height: as indicated on drawings.
   5. Thickness: manufacturers' standard.
   6. Finish: Satin.
   7. Length: manufacturers' standard sections.
   8. Color: As indicated on drawings.

## 2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

C. Copper Grounding Strips: Type and size as recommended by static control flooring manufacturer.

D. Floor Polish for Static Control Flooring: Fluid-applied polish, intended to protect electrical properties of flooring, as recommended by static control flooring manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

### 3.02 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:
   1. Fit joints and butt seams tightly.
   2. Set flooring in place, press with heavy roller to attain full adhesion.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

### 3.03 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

### 3.04 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

### 3.05 INSTALLATION - STAIR COVERINGS

A. Adhere over entire surface. Fit accurately and securely.

### 3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

**END OF SECTION 09 65 00**

## SECTION 09 65 66
## RESILIENT ATHLETIC FLOORING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Rubber tile, adhesively installed.

### 1.02 REFERENCE STANDARDS

A. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

B. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

C. ASTM F2772 - Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems; 2011 (Reapproved 2019).

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Selection Samples: Manufacturer's color charts for flooring materials specified and game line paints, indicating full range of colors and textures available.

D. Test Reports: Submit test reports showing compliance with ASTM F2772.

E. Manufacturer's Instructions: Indicate standard and special installation procedures.

F. Installer's qualification statement.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

B. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

### 1.06 FIELD CONDITIONS

A. Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 70 to 95 degrees F (21 to 35 degrees C) for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed. Subsequently, do not allow temperature in installed spaces to drop below 50 degrees F (10 degrees C) or to go above 100 degrees F (38 degrees C).

### PART 2 PRODUCTS

### 2.01 PREFORMED ATHLETIC FLOORING

A. Rubber Tile Flooring: Recycled vulcanized rubber and colored granules.
   1. Thickness: Minimum 3/8 inch (10 mm).
   2. Tile Edge/Installation: Straight, adhesive installation.
   3. Size, Straight Edge Tile: Nominal As indicated on drawings.
   4. Surface Texture: Smooth.
   5. Color: As indicated on drawings.
   6. Products:
      a. North West Rubber: www.northwestrubber.com/#sle.

b. Basis of DesignRoppe Corporation; Tuflex Spartus Multipurpose Sports Flooring: www.roppe.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 ACCESSORIES**

A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.

B. Flooring Adhesive: Waterproof; types recommended by flooring manufacturer.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
1. Test as Follows:
a. Alkalinity (pH): ASTM F710.
b. Internal Relative Humidity: ASTM F2170.
c. Moisture Vapor Emission: ASTM F1869.
2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

**3.02 PREPARATION**

A. Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/8 inch within 10 ft radius (1/1000).

B. Remove coatings that are incompatible with flooring adhesives, using methods recommended by flooring manufacturer.

C. Broom clean areas to receive athletic flooring immediately before beginning installation.

**3.03 INSTALLATION**

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Rubber Tile Flooring:
1. Lay out center lines in spaces to receive tile flooring, based on location of principal walls. Start tile installation from center, and adjust as necessary to avoid tiles less than one-half width at perimeter.
2. Lay tiles square with room axis, matching for color and pattern by selecting from cartons and mixing as recommended by manufacturer.
3. Spread only enough adhesive to permit installation of materials before initial set.
4. Fit joints and butt seams tightly; press with heavy roller to attain full adhesion.

**3.04 CLEANING**

A. Clean flooring using methods recommended by manufacturer.

**3.05 PROTECTION**

A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Completion.

**END OF SECTION 09 65 66**

## SECTION 09 68 13
## TILE CARPETING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

### 1.02 REFERENCE STANDARDS

A. AATCC Test Method 16 - Colorfastness to Light; 2004, with Editorial Revision (2010).

B. AATCC Test Method 134 - Test Method for Electrostatic Propensity of Carpets; 2019.

C. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).

D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.

E. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2021a, with Editorial Revision.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

E. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

### 1.05 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Tile Carpeting:
   1. Basis of Design: Milliken & Company; Counterculture: www.milliken.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 MATERIALS

A. Tile Carpeting: Tufted, textured loop, manufactured in one color dye lot.
   1. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
   2. Flammability: Radiant Panel ASTM E648 ≥ Class 1.
   3. Smoke Density: (NFPA-258-T or ASTM E662) ≤ 450.
   4. Lightfastness: (AATCC 16E) ≥ ? 4.0 at 80 Hours
   5. Crocking: (AATCC 165) ≥ 4.0 Wet or Dry
   6. Static Electricity: (AATCC-134) 20% R.H.,70° F. ≤ 3.5 KV, Permanent Conductive Fiber
   7. Stain Resist / Soil Release: StainSmart®

8. Dye Method: Solution Dyed
9. Tufted Face Weight: 14 oz/yd² (474.7 g/m²)
10. Gauge: 1/12
11. Stitches Per Inch: 9.5
12. Tufts: 114/in² (1,766/100 cm²)
13. Finished Pile Height: 0.124” (3.15 mm)
14. Finished Pile Thickness: 0.103” (2.62 mm)
15. Average Density (Finished): 4,935
16. Embodied Carbon: 12.31 (kg CO2 e)/m2
17. Nominal Total Thickness: 0.314” (8.0 mm)
18. Total Weight: 95.5 oz/sq yd (3238 g/sq m).

B. Modular Entrance Flooring, tile carpeting; 19.7" x 19.7"
1. Basis of Design: Product: OBEX Tile Loop manufactured by Milliken & Company.
2. Color and pattern as indicated on drawings and schedule.
3. Construction: Tufted, Multi-Level Loop
4. Tile Size: 19.7 in x 19.7 in.
5. Textile Yarn Type: ECONYL Solution-Dyed Nylon Type 7 and Solution- Dyed Nylon Monofilament
6. Dye method: Solution Dye
7. Tufted face weight: 27.9 oz/sqyd
8. Gauge: 1/12
9. Stitched per inch: 11.13
10. Tufts: 135.6 / sq in
11. Nominal total thickness: 0.39 in
12. Nominal total weight: 104.2 oz/sqyd
13. Standard backing: PVC-free WellBAC(tm); Comfort Cushion
    a. Available with TractionBack (tm)
14. Recycled content by total weight: 33.3% Pre-consumer; 6.6% Post-consumer
15. Flammability (Radiant Panel ASTM E648-15e1: Class 1
16. Smoke Density (NFPA-258 or ASTM E662-15a ≤450
17. Methenamine Pill Test (CPSC ff 1-70 or ASTM D2859-96; self extinguishing
18. Lightfastness AATCC Test Method 16 ≤4.0 at 80 hours
19. Crocking AATCC 165 ≤4.0 at 80 hours
20. Static Electricity AATCC Test Method 134 20% R.H., 70 degrees F; ≤3.5 0 at 80 hours
21. Recommend Maintenance: Daily vacuum and deep clean with hot water extraction or milliCare Textile and Carpet Care
22. Indoor Air Quality - CRI Green Label Plus
    a. GLP7205, Carpet Category 13X
23. Recommended Installation Method (s): Quarter-Turn.
24. Warranties
    a. 5 Year Face Fiber Wear
    b. Lifetime Antistatic
    c. Lifetime Floor Compatibility
    d. Lifetime Color Pattern Permanency
    e. Lifetime Floor Release
    f. Lifetime Cushion Resiliency
    g. Lifetime Moisture Resistance
    h. Lifetime Delamination of Backing
    i. Lifetime Staining/Soiling (StainSmart®)
    j. Lifetime Dimensional Stability
    k. Lifetime Tufted Bind

**END OF SECTION 09 68 13**

## SECTION 09 84 30
## SOUND-ABSORBING WALL AND CEILING UNITS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Sound-absorbing panels.

B. Sound-absorbing ceiling baffles.

### 1.02 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel layout and fabric orientation.

D. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with at least three years of documented experience.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

### PART 2 PRODUCTS

### 2.01 FIBERGLASS SOUND-ABSORBING UNITS

A. Manufacturers:
   1. Armstrong World Industries; Soundscapes Blades: www.armstrongceilings.com
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Rigid Fiberglass Board for Ceilings:
   1. Sound Absorption: Noise Reduction Coefficient (NRC) of up to 2.05 when tested in accordance with ASTM C423.
   2. Light Reflectance: 88%
   3. Fire Performance: Class A
   4. Color: see finish schedule.

### 2.02 BASIS OF DESIGN: SOUND-ABSORBING UNITS

A. Manufacturer:
   1. Arktura, LLC; www.arktura.com
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Arktura SoftScreen wall panel / partition, product: Slant.
   1. Soft Sound® acoustical material: Felting 100% PET plastic.
   2. Fire Rating:
      a. ASTM E84-14 Class A / CAN ULC S102
   3. Sound Absorption:

a. ASTM C423-90A for raw material
b. 9mm:
1) NRC 0.75 (50mm air gap)
4. Type: as indicated on drawings.
5. Height: as indicated on drawings.
6. Color:
a. Color Group A: Heather Gray.
7. Mounting Application: as indicated on drawings.

**2.03 ACCESSORIES**

A. Spline-Mounting Accessories: Manufacturer's standard concealed connecting splines of extruded aluminum designed for screw attachment to walls, with coordinating moldings and trim for interior and exterior corners and miscellaneous conditions.
1. Color of Exposed Trim: As selected from manufacturer's standards.

B. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as indicated on each acoustical unit, sized appropriately for weight of acoustical unit.

C. Tensioned Cable System: Manufacturer's standard accessories for mounting conditions and spans indicated.

D. Standoff Mounting System: Manufacturer's standard accessories for mounting conditions and spans indicated.

E. Trim Moldings: Manufacturer's standard wood or vinyl trim moldings for concealing panel joints; color as selected from manufacturer's standards.

F. Fixing Clips: Manufacturers standard for application as indicated.

G. Panel Adhesive: Acceptable to acoustical panel manufacturer for application as indicated.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. Install mounting accessories and supports in accordance with shop drawings.

**3.02 CLEANING**

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

**3.03 PROTECTION**

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

**END OF SECTION 09 84 30**

**SECTION 09 90 00**
**PAINTING AND COATING - COMMERCIAL FACILITY GUIDE SPECIFICATION - SHERWIN-WILLIAMS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

### 1.02 REFERENCE STANDARDS

A. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.
   6. Clean-up information.

C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.

### 1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

### 1.06 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.

B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.

B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 60 00 - Product Requirements, and the following:
   1. Other Acceptable Manufacturers:

## 2.02 PAINTINGS AND COATINGS

A. General:
   1. Provide factory-mixed coatings unless otherwise indicated.
   2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

C. General Materials List; if no product is specified (All items might not be used in this project):
   1. Paint Code Material:

| | |
|---|---|
| A | Loxon 7% Siloxane Water Repellant (A10T7) |
| B | Pro Industrial Zero VOC Acrylic Coating Gloss (B66-600 series) |
| C | Pro Industrial Zero VOC Acrylic Coating Semi-Gloss (B66-650 series) |
| D | Pro Industrial Pro-Cryl Universal Metal Primer (B66-310) |
| E | Loxon Block Surfacer (A24-W200) |
| F | Benjamin Moore Ultra Spec 500 Interior Primer |
| G | Pro Industrial Pro-Cryl Universal Metal Primer (B66-310) |
| H | Traffic Marking Paint (Refer to Division 32, Exterior Improvements) |
| I | Sher-Cryl High Performance Acrylic Gloss (B66-300 series) |
| J | ProBlock Latex Primer/Sealer (B51W20) |
| K | Floor Stripe Paint |
| L | Exterior Concrete Sealer, Koester VAPI 20000 |
| M | VersaFlex WBG 250 |
| N | Waterborne Acrylic Dryfall Egg-shell (B42-W2) |
| O | Progreen 200 Interior Latex Semi-Gloss (B31W651 series) |
| P | Manufacturer's Standard Recommended Finish(es) |
| Q | Pre-Catalyzed (one component) Water-Based Epoxy |
| R | Benjamin Moore Ultra Spec Scuff-X 485 Eggshell finish |
| S | Benjamin Moore Ultra Spec Scuff-X 485 Semi-gloss finish |

   2. **Interior Surfaces:**

| | Surface | 1 st | 2 nd | 3rd |
|---|---|---|---|---|
| 1 | Ferrous metal | G1 | I | I |
| 2 | Galvanized metals | D | I | I |
| 3 | Concrete masonry units, painted, latex enamel | E | N | N |
| 4 | Gypsum Board | F | R | R |
| 5 | Wood moulding, wainscot system | J | S | S |
| 6 | Plywood liner panels | J2 | - | - |
| 7 | Ferrous metals, Pre-Engineered Metal Building structural steel | G5 | - | - |
| 8 | Exposed piping, tubes and conduits (note #3) | D | I | I |
| 9 | Concrete floor | M | M | - |
| 10 | Gypsum board at toilet rooms | F | Q | Q |
| 11 | Gypsum board at janitor rooms | F | Q | Q |
| 12 | Liner panel (interior) | J | - | - |
| 13 | Miscellaneous mounting boards | J | C | C |

      a. Note #1: Shop coat by others
      b. Note #2: Prime both sides
      c. Note #3: In finished areas
      d. Note #4: By others
      e. Note #5: Pre-engineered Metal Building Manufacturer's standard shop coat system
   3. Exterior Surfaces:

| | Surface | 1 st | 2 nd | 3rd |
|---|---|---|---|---|
| 1 | Ferrous Metals (Shop Coat) | G1 | I | I |
| 2 | Galvanized Metal | D | I | I |
| 3 | Asphalt Paving Striping (Refer to Division 32) | | | |
| 4 | Pre-Engineered Building, Door channels & frames | G1 | I | I |
| 5 | Exterior Piping | G | I | I |
| 6 | Concrete Masonry Units (common smooth face) | 2 | A | A |
| 7 | Exposed reinforced concrete (grade beams, foundations) | -- | -- | -- |
| 8 | Fiber cement board | P | P | P |
| 9 | Pre-Engineered Metal Building canopy structural steel | G1 | B,C | B,C |
| 10 | Exterior concrete surfaces (drives, walks, ramps, etc.) | L | L | -- |

a. Note 1: Shopcoat is by others
b. Note 2: Topical treatment of the CMU is in addition to the water repellent admixture integral to both the CMU and mortar

**2.03 PAINT SYSTEMS - EXTERIOR**

A. Concrete: Cementitious siding, Flexboard, Transite, non-roof shingles, common brick, stucco, tilt-up, precast, and poured-in-place cement.
1. Latex Systems:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer LX02W50: www.sherwin-williams.com/#sle.
(a) 5.3 to 8 mils wet, 2.1 to 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Exterior Latex Gloss, A8 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.3 mils dry per coat.
b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer LX02W50: www.sherwin-williams.com/#sle.
(a) 5.3 to 8 mils wet, 2.1 to 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.
(a) 6 to 12 mils wet, 2 to 4 mils dry per coat.
c. Satin Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer LX02W50: www.sherwin-williams.com/#sle.
(a) 5.3 to 8 mils wet, 2.1 to 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Satin, A82 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
d. Flat Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer LX02W50: www.sherwin-williams.com/#sle.
(a) 5.3 to 8 mils wet, 2.1 to 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Flat, A6 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.2 mils dry per coat.
2. Textured and Smooth Systems:

a. Textured Finish, Water Based:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer LX02W50: www.sherwin-williams.com/#sle.
(a) 5.3 to 8 mils wet, 2.1 to 3.2 mils dry.
2) 2nd Coat: Sherwin-Williams Conflex UltraCrete Acrylic Textured Masonry Topcoat CF18W800 Series: www.sherwin-williams.com/#sle.
(a) 50 to 80 sq ft/gal (1.2 to 1.9 sq m/L).
(b) Textured Finish: Medium.
b. Smooth Finish, Water Based, Satin:
1) 1st and 2nd Coat: Sherwin Williams Loxon XP, LX21W50 Series: www.sherwin-williams.com/#sle.
(a) 14 to 18 mils wet, 6.4 to 8.3 mils dry per coat.
c. Smooth Finish, Water Based, Flat:
1) 1st and 2nd Coat: Sherwin Williams Loxon XP, LX11W50 Series: www.sherwin-williams.com/#sle.
(a) 14 to 18 mils wet, 6.4 to 8.3 mils dry per coat.

B. Masonry: Concrete masonry units (CMU), cinder or concrete block.
1. Latex Systems:
a. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 series: www.sherwin-williams.com/#sle.
(a) 6 to 12 mils wet, 2 to 4 mils dry per coat.
b. Satin Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Satin, A82 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
c. Flat Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Flat, A6 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.2 mils dry per coat.

C. Concrete: Non-vehicular floors, patios, porches, steps, and platforms.
1. Acrylic System, Water Based:
a. Floor Finish:
1) 1st and 2nd Coat: Sherwin-Williams Porch and Floor Enamel, A32-200 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
b. Floor Finish:
1) 1st and 2nd Coat: Sherwin-Williams ConFlex Flexible Concrete Waterproofer-Smooth, CF14W50 Series: www.sherwin-williams.com/#sle.
(a) 10 to 12 mils wet per coat.

D. Metal: Aluminum, galvanized.
1. Latex Systems:
a. Gloss Finish:

1) 1st and 2nd Coats: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

b. Semi-Gloss Finish:
1) 1st and 2nd Coats: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

c. Satin Finish:
1) 1st and 2nd Coats: Sherwin-Williams Pro Industrial Acrylic Eg-Shel, B66-660 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

d. Flat Finish:
1) 1st and 2nd Coats: Sherwin-Williams A-100 Exterior Latex Flat, A6 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.2 mils dry per coat.

2. Alkyd Systems, Water Based:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

c. Low Sheen Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

E. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
1. Latex Systems:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 to 10 mils wet, 1.8 to 3.6 mils dry per coat.
2) 2nd and 3rd Coats: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 to 10 mils wet, 1.8 to 3.6 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

2. Alkyd Systems, Water Based:
    a. Gloss Finish:
        1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
            (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
    b. Semi-Gloss Finish:
        1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
            (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
    c. Low Sheen Finish:
        1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.
            (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

F. Drywall: Gypsum board and exterior drywall.
    1. Latex Systems:
        a. Gloss Finish:
            1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.4 mils dry per coat.
            2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Gloss, A8 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.3 mils dry per coat.
        b. Semi-Gloss Finish:
            1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.4 mils dry per coat.
            2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 series: www.sherwin-williams.com/#sle.
                (a) 2 to 4 mils dry per coat.
        c. Satin Finish:
            1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.4 mils dry per coat.
            2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Satin, A82 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.5 mils dry per coat.
        d. Flat Finish:
            1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.4 mils dry per coat.
            2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Flat, A6 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.2 mils dry per coat.

## 2.04 PAINT SYSTEMS - INTERIOR

A. Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.
   1. Latex Systems:
      a. Gloss Finish High Performance:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
            (a) 6 mils wet, 2.5 mils dry per coat.
      b. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
      c. Semi-Gloss Finish High Performance (HP):
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1950 Series: www.sherwin-williams.com/#sle.
      d. Semi-Gloss Finish Scuff Resistant Waterbase Enamel:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel, Semi-Gloss, S26-50 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.2 mils dry per coat.
      e. Eg-Shel Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.7 mils dry per coat.
      f. Eg-Shel Finish High Performance (HP):
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Eg-Shel, B20-1950 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.7 mils dry per coat.
      g. Eg-Shel Finish Scuff Resistant Waterbase Enamel:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel, Eg-Shel, S24-50 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.2 mils dry per coat.
      h. Low Sheen Finish:

1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
   (a) 8 mils wet, 3.2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Low Gloss Eg-Shel, B41-2600 Series: www.sherwin-williams.com/#sle.
   (a) 4 mils wet, 1.6 mils dry per coat.

i. Low Sheen Finish High Performance (HP):
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
   (a) 8 mils wet, 3.2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Latex Low Gloss Eg-Shel, B41-1950 Series: www.sherwin-williams.com/#sle.
   (a) 4 mils wet, 1.6 mils dry per coat.

j. Flat Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
   (a) 8 mils wet, 3.2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.
   (a) 4 mils wet, 1.6 mils dry per coat.

k. Flat Finish Scuff Resistant Waterbase Enamel:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
   (a) 8 mils wet, 3.2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel, Matte, S23-50 Series: www.sherwin-williams.com/#sle.
   (a) 4 mils wet, 1.3 mils dry per coat.

2. Alkyd Systems, Water Based:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
   (a) 8 mils wet, 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
   (a) 4 mils wet, 1.7 mils dry per coat.

b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
   (a) 8 mils wet, 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
   (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

c. Low Sheen Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.
   (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

3. Epoxy Systems, Water Based:
a. Gloss Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series: www.sherwin-williams.com/#sle.
   (a) 5 mils wet, 2 mils dry per coat.

b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
(a) 8 mils wet, 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com/#sle.
c. Eg-Shel/Low Luster Finish:
1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
(a) 8 mils wet, 3.2 mils dry.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
d. Eg-Shel/Low Luster Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Water Based Catalyzed Epoxy, B73-360 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.

B. Concrete Ceilings: Poured concrete, precast concrete, cement board, cast-in-place concrete, and plaster.
1. Dryfall Waterborne Topcoats:
a. Semi-Gloss Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-83 Series: www.sherwin-williams.com/#sle.
(a) 5.8 mils wet, 2.3 mils dry per coat.
b. Eg-Shel Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-82 Series: www.sherwin-williams.com/#sle.
(a) 6 mils wet, 1.9 mils dry per coat.
c. Flat Finish:
1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-181 Series: www.sherwin-williams.com/#sle.
(a) 6 mils wet, 1.7 mils dry per coat.

C. Masonry CMU: Concrete, split face, scored, smooth, high density, low density, and fluted.
1. Latex Systems:
a. Gloss Finish High Performance:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
(a) 6 mils wet, 2.5 mils dry per coat.
b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
c. Semi-Gloss Finish High Performance (HP):
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).

2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1950 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.6 mils dry per coat.

2. Alkyd Systems, Water Based:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
c. Low Sheen Finish:
1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
(a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

D. Metal: Aluminum and galvanized.
1. Latex Systems:
a. Gloss Finish High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.
b. Semi-Gloss High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.
c. Eg-Shel/Satin Finish High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coats: Sherwin-Williams Pro Industrial Acrylic Eg-Shel, B66-660 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.
2. Alkyd Systems, Water Based:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.

2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

b. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

c. Low Sheen Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.
(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

3. Urethane System, Water Based:
a. Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Waterbased Acrolon 100, B65-720 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 2 mils dry per coat.

b. Gloss Finish, Single Component:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Urethane Gloss, B65-120 Series: www.sherwin-williams.com/#sle.

E. Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
1. Latex Systems:
a. Gloss Finish High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coats: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

b. Semi-Gloss High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.
(a) 2 to 4 mils dry per coat.

c. Eg-Shel/Satin Finish High Performance:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.

2. Alkyd Systems, Water Based:

a. Gloss Finish:
    1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
    2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
        (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
b. Semi-Gloss Finish:
    1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
        (a) 5 mils wet, 2 mils dry per coat.
    2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
        (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

F. Wood: Walls, ceilings, doors, and trim.
1. Latex Systems:
    a. Gloss Finish:
        1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.8 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams ProClassic Waterborne Acrylic Gloss, B21-51 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
    b. Semi-Gloss Finish:
        1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.8 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams ProClassic Waterborne Acrylic Semi-Gloss, B31 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.3 mils dry per coat.
    c. Semi-Gloss Finish:
        1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.8 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel Semi-Gloss, S26-50 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.2 mils dry per coat.
    d. Eg-Shel/Satin Finish:
        1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.8 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams ProClassic Waterborne Acrylic Satin, B20 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.2 mils dry per coat.
    e. Eg-Shel/Satin Finish:
        1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.8 mils dry per coat.
        2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel, Eg-Shel, S24-50 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.2 mils dry per coat.
    f. Flat Finish:
        1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.

(a) 4 mils wet, 1.8 mils dry per coat.

2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.

(a) 4 mils wet, 1.6 mils dry per coat.

2. Alkyd Systems, Water Based:
   a. Gloss Systems:
      1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
         (a) 4 mils wet, 1.8 mils dry per coat.
      2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
         (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
   b. Semi-Gloss Finish:
      1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
         (a) 4 mils wet, 1.8 mils dry per coat.
      2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
         (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
3. Stain and Varnish System:
   a. Satin Finish:
      1) 1st Coat: Sherwin-Williams Minwax Performance Series Tintable Wood Stain 250 VOC: www.sherwin-williams.com/#sle.
      2) 2nd and 3rd Coat: Sherwin-Williams Minwax Waterbased Oil-Modified Polyurethane: www.sherwin-williams.com/#sle.
         (a) 4 mils wet, 1 mil dry per coat.

G. Drywall: Walls, ceilings, gypsum board, and similar items.
   1. Latex Systems:
      a. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
      b. Semi-Gloss Finish High Performance (HP):
         1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1950 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.6 mils dry per coat.
      c. Semi-Gloss Finish Scuff Resistant Waterbase Enamel:
         1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel, Semi-Gloss, S26-50 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.2 mils dry per coat.
      d. Eg-Shel Finish:
         1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.

2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.7 mils dry per coat.

e. Low Sheen Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Low Gloss Eg-Shel, B41-1950 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.6 mils dry per coat.

f. Flat Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.6 mils dry per coat.

H. Concrete: Floors, non-vehicular.
1. Latex Systems:
a. Satin Finish:
1) 1st and 2nd Coat: Sherwin-Williams Porch and Floor Enamel, A32-200 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.02 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

### 3.03 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

**END OF SECTION 09 90 00**

**SECTION 10 14 16**
**PLAQUES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Plaques.

### 1.02 REFERENCE STANDARDS

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Package plaque signs as required to prevent damage before installation.

B. Store under cover and elevated above grade.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Plaques:
   1. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
   2. Takeform: www.takeform.net/#sle.
   3. Bronze Memorials: wwww.bronzememorials.net.
   4. American Cast Bronze Plaques: www.americancastbronzeplaques.com
   5. Woodland Manufacturing; www.woodlandmanufacturing.com
   6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 PLAQUES

A. Metal Plaques:
   1. Material: Bronze casting.
   2. Material Thickness: 1/8 inch (3 mm), minimum.
   3. Size: As indicated on drawings.
   4. Text and Typeface:
      a. Character Font: as indicated on drawings.
      b. Character Case: Upper case only.
      c. Character Color: Contrast with background color.
   5. Protective Coating: Manufacturer's standard clear coating.
   6. Mounting: Blind studs.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Protect from damage until mm-dd-yyyy; repair or replace damaged items.

**END OF SECTION 10 14 16**

## SECTION 10 14 19
## DIMENSIONAL LETTER SIGNAGE

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Dimensional letter signage.

B. Illumination system.

### 1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 879 - Electric Sign Components; Current Edition, Including All Revisions.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.

C. Shop Drawings:
   1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.
   2. Show locations of electrical service connections.
   3. Include diagrams for power, signal, and control wiring.

D. Samples: Submit one sample of each type of dimensional letter sign of size similar to that required for project, indicating sign style, font, and method of attachment.

E. Selection Samples: Where materials, colors, and finishes are not specified, submit two sets of selection charts or chips.

F. Verification Samples: Submit samples showing colors and finishes specified.

G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Package dimensional letter signs as required to prevent damage before installation.

B. Store under cover and elevated above grade.

### 1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Dimensional Letter Signs:
   1. CityScapes Inc: www.cityscapesinc.com/#sle.
   2. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
   3. Inpro Corporation: www.inprocorp.com/#sle.
   4. Takeform: www.takeform.net/#sle.

5. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 DIMENSIONAL LETTERS

A. Applications: Building identification.
   1. Use individual metal letters.
   2. Mounting Location: Exterior as indicated on drawings.

B. Metal Letters:
   1. Material: Aluminum casting.
   2. Thickness: Manufacturer's standard for letter size.
   3. Letter Height: As indicated on drawings.
   4. Text and Typeface:
      a. Character Font: Helvetica, Arial, or other sans serif font.
      b. Character Case: Upper case only.
   5. Finish: As selected by Architect from manufacturer's full range.
   6. Color: As selected.
   7. Mounting: Concealed screws.
   8. Illumination System: Halo-lit reverse channel letters.
      a. Provide products that are listed and labeled as complying with UL 879, where applicable.
      b. Power: 120 V, 60 Hz, 1 phase, 15 A.

## 2.03 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

B. Electrical Components and Devices: Listed and labeled as defined in NFPA 70 by a qualified testing agency.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate dimensional letter signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until final acceptance by owner; repair or replace damaged items.

**END OF SECTION 10 14 19**

**SECTION 10 14 23**
**PANEL SIGNAGE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Panel signage.

### 1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.

C. Shop Drawings:
   1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
   2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
      a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
      b. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
      c. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, indicating sign style, font, and method of attachment.

E. Selection Samples: Where colors, materials, and finishes are not specified, submit two sets of color selection charts or chips.

F. Verification Samples: Submit samples showing colors, materials, and finishes specified.

G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

H. Manufacturer's qualification statement.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

### 1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Panel Signage:

1. Best Sign Systems, Inc: www.bestsigns.com/#sle.
2. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
3. Inpro Corporation: www.inprocorp.com/#sle.
4. Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
5. Seton Identification Products: www.seton.com/aec/#sle.
6. Takeform: www.takeform.net/#sle.
7. Vista System LLC: www.vistasystem.com/#sle.
8. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 REGULATORY REQUIREMENTS

A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

### 2.03 PANEL SIGNAGE

A. Panel Signage:
   1. Application: Room and door signs.
   2. Description: Flat signs with engraved panel media, tactile characters.
   3. Sign Size: As indicated on drawings.
   4. Total Thickness: 1/8 inch (3 mm).
   5. Color and Font, unless otherwise indicated:
      a. Character Font: Helvetica, Arial, or other sans serif font.
      b. Character Case: Upper and lower case (title case).
      c. Background Color: As scheduled.
      d. Character Color: Contrasting color.
   6. Material: Laminated colored plastic engraved through face to expose core as background color.
   7. Profile: Flat panel in matching plastic frame.
   8. Tactile Letters: Raised 1/32 inch minimum.
   9. Braille: Grade II, ADA-compliant.
   10. One-Sided Wall Mounting: Tape adhesive.

### 2.04 SIGNAGE APPLICATIONS

A. Room and Door Signs:
   1. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section for replaceable occupant name.
   2. Conference and Meeting Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section with sliding "In Use/Vacant" indicator.
   3. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
   4. Rest Rooms: Identify with pictograms, the names "UNISEX", "MEN" and "WOMEN", room numbers to be determined later, and braille.

### 2.05 ACCESSORIES

A. Tape Adhesive: Double-sided tape, permanent adhesive.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

### 3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until final completion and project is signed over to the owner; repair or replace damaged items.

**END OF SECTION 10 14 23**

**SECTION 10 21 13.17**
**PHENOLIC TOILET COMPARTMENTS - ASI**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Phenolic toilet compartments.

B. Phenolic urinal screens.

### 1.02 RELATED REQUIREMENTS

A. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

### 1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2023a.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

D. ASTM A743/A743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application; 2021.

E. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate work with placement of support framing and anchors in walls and ceilings.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on panel construction, hardware, accessories, and finishes.

C. Shop Drawings:
   1. Indicate plans, elevations, and dimensions. Include door swings, toilet fixture centerlines, and floor drains on plans.
   2. Indicate details of wall and floor supports and attachments.

D. Samples:
   1. For Initial Selection: Submit color charts and samples for each type of toilet compartment material.
   2. For Verification: Submit two samples of partition materials, 3 by 3 inches (76 by 76 mm) in size, indicating color.

E. Manufacturer's qualification statement.

### 1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

## 1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle materials and products in accordance with manufacturer's instructions, recommendations, and industry standards.

B. Do not deliver materials or begin installation until building enclosed, with complete protection from outside weather, and maintain building temperature at minimum of 60 degrees F (15.6 degrees C).

C. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.

D. Lay cartons flat, with adequate support to ensure flatness and prevent damage to prefinished surfaces.

E. Do not store where ambient temperature exceeds 120 degrees F (49 degrees C).

## 1.08 FIELD CONDITIONS

A. Ambient Conditions: Maintain environmental conditions such as temperature, humidity, and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## 1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Black Core or Color-Thru Phenolic Finish Warranty: Provide 25-year manufacturer warranty against delamination, breakage or corrosion of black core or color-thru phenolic material properly maintained in accordance with manufacturer's recommendations.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. Basis of Design Manufacturer: ASI Global Partitions: www.asi-globalpartitions.com/#sle.

B. Substitutions: See Section 01 60 00 - Product Requirements.

C. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

## 2.02 PHENOLIC TOILET COMPARTMENTS

A. Alpaco Toilet Compartments: Black core phenolic, Alpaco Classic - floor anchored, overhead braced with pedestal legs.

B. Urinal Screens: Black core phenolic, wall hung.

C. Design Criteria:
   1. Accessibility: Design compartments indicated on drawings to comply with ICC A117.1 and ADA Standards.
   2. Black Core Phenolic Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, Class B, when tested in accordance with ASTM E84.

D. Fabrication:
   1. Fabricate toilet compartment components to sizes indicated.
   2. Coordinate requirements and provide cutouts for through-partition toilet accessories and solid blocking within panel where required for attachment of toilet accessories.
   3. Provide shoes and caps at pilasters and posts to conceal anchorage, supports, and leveling mechanisms.
   4. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.
   5. Floor Anchored, Overhead Braced Units with Adjustable Pedestals: Provide adjustable pedestals at pilasters to suit floor conditions.

## 2.03 COMPONENTS

A. Doors, Panels, and Pilasters: Phenolic-resin impregnated, wood-based product core with melamine-impregnated decorative surface papers and transparent, protective topcoat; NEMA LD 3 Compact Laminate.
   1. Finish: Matte.
   2. Black Core Phenolic Color: As selected from manufacturer's color card.

B. Standard Door and Panel Dimensions:
   1. Door Thickness: 3/4 inch (19 mm).
   2. Door Width: 24 inches (610 mm).
   3. Door Width for Handicapped Use: 36 inches (915 mm), outswinging.
   4. Ultimate Privacy-72:
      a. Door Panel Height: 72 inches (1829 mm).
      b. Door Height above Floor: 6 inches (152 mm).
   5. Panel Thickness: 1/2 inch (13 mm).
   6. Urinal and Entrance Screen Panel Height: 48 inches (1219 mm).
   7. Urinal and Entrance Screen Panel Height above Floor: 12 inches (305 mm).

C. Standard Pilasters: 3/4 inch (19 mm) thick, of sizes required to suit compartment width and spacing.
   1. Pilaster Height: 82 inches (2032 mm).
   2. Easy-Stall Pilaster Shoes: Formed 20 gauge, 0.0359 inch (0.91 mm) ASTM A666 Type 304 stainless steel with No.4 finish, 3 inches (76 mm) high, concealing floor fastenings and leveling bolts; secured to pilaster with stainless steel tamper-resistant screws; secured to floor with concrete anchors.
      a. Provide height and leveling adjustment with machine thread leveling bolts and bottom of pilaster threaded inserts.
      b. Provide Easy-Stall shoes at floor anchored, overhead braced toilet compartments.
   3. Pilaster Anchors: Manufacturer's standard mounting bars attached to pilaster and secured to building structure.

D. Standard Head Rails: Hollow anodized aluminum tube, 1-inch by 1-5/8-inch (25 mm by 41 mm) size, with anti-grip surface and aluminum wall brackets.

E. Alpaco Classic and Alpaco Elegance Panel or Pilaster Pedestal Legs: Brushed stainless steel, adjustable in height plus or minus to 1 inch (25 mm) to support panel 4 inches (102 mm) above finished floor.

F. Alpaco Classic Head Rails: Extruded aluminum headrail, octagonal in cross-section, powder - coated black.

## 2.04 MATERIALS

A. Aluminum Extrusions: ASTM B221 (ASTM B221M).

B. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

C. Stainless Steel Castings: ASTM A743/A743M.

D. Zamac: ASTM B86, commercial zinc-alloy die castings, chrome plated.

E. Phenolic Panels: Monolithic core of phenolic resin, reinforced with cellulose fibers, manufactured under high pressure and at high temperatures, with melamine-impregnated decorative surface papers; NEMA LD 3, Compact Laminate.

## 2.05 HARDWARE AND ACCESSORIES

A. Brackets:
   1. Continuous Type: Brushed stainless steel, standard depth.

B. Alpaco Door Hardware:
   1. Hinges: Brushed stainless steel barrel hinges.

2. Latch and Keeper: Brushed stainless steel latch with occupancy indicator.
3. Coat Hook: Brushed stainless steel. Manufacturer's Alpaco coat hook with rubber bumper; one per compartment, mounted on door.
4. Door Pull: Brushed stainless steel. Provide door pull for outswinging doors. Provide on both sides of doors designated as accessible.
5. Door Bumper: Brushed stainless steel. Provide rubber-tipped door bumpers at out-swinging doors.

C. Attachments, Screws, and Bolts: Stainless steel, tamper-resistant type.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's written instructions.

B. Attach Easy Stall shoe system to floor with 1/4 by 2 inch (6 by 52 mm) screws. Insert pilaster into Easy Stall shoe and secure after height adjustment.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster centerlines.

E. Field touch-up of scratches or damaged finish not permitted. Replace damaged or scratched materials with new materials.

### 3.02 TOLERANCES

A. Maximum Variation from True Position: 1/4 inch (6 mm).

B. Maximum Variation from Plumb: 1/8 inch (3 mm).

### 3.03 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).

B. Adjust hinges to locate doors in partially opened position when unlatched. Return outswinging doors to closed condition.

C. Adjust adjacent components for consistency of line or plane.

### 3.04 CLEANING

A. Clean partition and screen surfaces with materials and cleansers in accordance with manufacturer's recommendations.

**END OF SECTION 10 21 13.17**

## SECTION 10 21 23
## CUBICLE CURTAINS AND TRACK

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Surface mounted overhead curtain track and guides.

B. Blackout curtains.

### 1.02 RELATED REQUIREMENTS

A. Section 09 51 00 - Acoustical Ceilings: Suspended ceiling system to support track.

### 1.03 REFERENCE STANDARDS

A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for curtain fabric characteristics.

C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.

D. Samples: Submit 12 by 12 inch (300 by 300 mm) sample patch of curtain cloth with representative top, bottom, and edge hem stitch detail, heading with reinforcement and carrier attachment to curtain header.

E. Samples: Submit 12 inch (300 mm) sample length of curtain track including typical splice, wall and ceiling hanger, and escutcheon.

F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention .

G. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

### 2.02 TRACKS AND TRACK COMPONENTS

A. Tracks: Extruded aluminum sections; one piece per track run.
   1. Profile: Channel.
   2. Mounting: Surface.
   3. Track End Stop: To fit track section.
   4. Track Bends: Minimum 12 inch (300 mm) radius; fabricated without deformation of track section or impeding movement of carriers.
   5. Finish on Exposed Surfaces: White enamel.
   6. Products:
      a. American Track Supply: www.americantracksupply.com/#sle.
      b. A. R. Nelson Co: www.arnelson.com/#sle.
      c. Construction Specialties, Inc: www.c-sgroup.com/#sle.
      d. Imperial Fastener Co., Inc: www.imperialfastener.com/#sle.
      e. Inpro: www.inprocorp.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.

B. Curtain Carriers: Nylon rollers, size and type compatible with track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.

C. Wand: Aluminum, attached to lead carrier, for pull-to-close action.

D. Installation Accessories: Types required for specified mounting method and substrate conditions.

### 2.03 CURTAINS

A. Blackout Curtains:
   1. Inherently flame resistant or flameproofed; capable of passing NFPA 701 test.
   2. Material: Polyester.
   3. Valance: Same material and color as blackout curtain, adhered to face of track with hook and loop fastener strip, 12 inch (305 mm) drop.
   4. Products:
      a. Blackout Curtains; Textron Black/Black: www.blackoutcurtains.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Curtain Fabrication:
   1. Width of curtain to be 10 percent wider than track length.
   2. Length of curtain to end 1/2 inches (12.7 mm) above finished floor.
   3. Fabricate blackout valance with flat seams and without added fullness.
   4. Seams and Hems: Manufacturer's standard fabrication method for securely sewn and finished seams and hems.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.

### 3.02 INSTALLATION

A. Install curtain track to be secure, rigid, and true to ceiling line.

B. Secure track to ceiling system.

C. Install curtains on carriers ensuring smooth operation.

D. Install blackout curtain valance on face of track.

**END OF SECTION 10 21 23**

## SECTION 10 28 00
## TOILET, BATH, AND LAUNDRY ACCESSORIES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Commercial shower and bath accessories.

C. Institutional ligature-resistant toilet accessories.

D. Under-lavatory pipe supply covers.

E. Electric hand/hair dryers.

F. Diaper changing stations.

G. Utility room accessories.

### 1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

E. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.

F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

G. ASTM C1036 - Standard Specification for Flat Glass; 2021.

H. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.

I. ASTM D4802 - Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet; 2016.

J. ASTM D5047 - Standard Specification for Polyethylene Terephthalate Film and Sheeting; 2017.

K. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. Basis of Design: Bobrick; www.bobrick.com.
   2. AJW Architectural Products: www.ajw.com/#sle.
   3. American Specialties, Inc: www.americanspecialties.com/#sle.
   4. Bradley Corporation: www.bradleycorp.com/#sle.
   5. Georgia-Pacific Professional; _____: www.gppro.com/#sle.
   6. Kimberly-Clark Corporation: www.kcprofessional.com/#sle.

7. Substitutions: Section 01 60 00 - Product Requirements.

B. Institutional Security and Ligature-Resistant Toilet and Bath Accessories:
   1. Bobrick; www.bobrick.com.
   2. American Specialties, Inc: www.americanspecialties.com/#sle.
   3. Whitehall Manufacturing: www.whitehallmfg.com/#sle.
   4. Substitutions: Section 01 60 00 - Product Requirements.

C. Under-Lavatory Pipe Supply Covers:
   1. Plumberex Specialty Products, Inc: www.plumberex.com/#sle.
   2. Substitutions: Section 01 60 00 - Product Requirements.

D. Electric Hand/Hair Dryers:
   1. Basis of Design: Excel Dryer ThinAir w/ HEPA filtration: www.exceldryer.com/#sle.
   2. American Specialties, Inc: www.americanspecialties.com/#sle.
   3. Dyson Inc: www.dyson.com/#sle.
   4. Frost Products Limited: www.frostproductsltd.com/#sle.
   5. Mitsubishi Electric Trane HVAC US LLC: www.mitsubishielectric.com/#sle.
   6. Stelpro Design Inc: www.stelpro.com/#sle.
   7. World Dryer Corporation: www.worlddryer.com/#sle.
   8. Substitutions: Section 01 60 00 - Product Requirements.

## 2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.

B. Stainless Steel Sheet: ASTM A666, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

E. Zinc Alloy: Die cast, ASTM B86.

F. Acrylic Plastic Sheet: ASTM D4802.

G. PETG Plastic Sheet: ASTM D5047.

H. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

## 2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

D. Powder-Coated Steel: Clean, degrease, and neutralize. Follow immediately with a phosphatizing treatment, prime coat, and two finish coats of powder coat enamel.

## 2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Double roll, surface mounted, for coreless type rolls.
   1. Products:
      a. Bobrick #B76867.

B. Toilet Paper Dispenser: Double roll, semi-recessed, stainless steel unit with pivot hinge, tumbler lock.
   1. Products:
      a. Bobrick #B667.

b. Substitutions: Section 01 60 00 - Product Requirements.

C. Paper Towel Dispenser: Folded paper type, manufacturers standard, manufactuerers standard with viewing slots on sides as refill indicator.
1. Capacity: Manufacturers' standard minimum.
2. Products:
a. Surface-mounted, single fold, paper towel dispenser,
1) Classic Series Bobrick #B-262.
b. Surface-mounted, single fold, paper towel dispenser,
c. ConturaSeries Bobrick #B-4262.
d. Counter top mounted, single fold, paper towel dispenser,
1) TrimLine series Bobrick #B-35903.
e. Substitutions: Section 01 60 00 - Product Requirements.

D. Paper Towel Dispenser: Electric, roll paper type.
1. Cover: Manufactuerers' standard.
2. Paper Discharge: Manufactuerers' standard.
3. Capacity: Manufactuerers' standard diameter roll.
4. Mounting: Surface mounted.
5. Power: Battery operated.
6. Refill Indicator: Illuminated refill indicator.
7. Products:
a. Bobrick #B-29744
b. Substitutions: Section 01 60 00 - Product Requirements.

E. Waste Receptacle: Stainless steel, freestanding style.
1. Liner: Removable seamless stainless steel receptacle.
2. Minimum capacity: 20 gallons (75 liters).
3. Products:
a. Bobrick #B-2400.
b. Substitutions: Section 01 60 00 - Product Requirements.

F. Waste Receptacle: Wall-mounted, stainless steel, seamless lower door for access to container, reinforced panel full height of door, continuously welded bottom pan and seamless exposed flanges.
1. Products:
a. Corner Waste Receptacle, Bobrick #B-268.
b. Substitutions: Section 01 60 00 - Product Requirements.

G. Soap Dispenser: Soap lather dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock.
1. Products:
a. Bobrick Classic Series #B2012
b. Substitutions: Section 01 60 00 - Product Requirements.

H. Mirrors: Stainless steel framed, 1/4 inch (6 mm) thick annealed float glass; ASTM C1036.
1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
2. Size: as indicated on drawings.
3. Backing: Full-mirror sized, minimum 0.03 inch (0.8 mm) galvanized steel sheet and nonabsorptive filler material.
4. Products:
a. Bobrick #B1658
b. Substitutions: Section 01 60 00 - Product Requirements.

I. Seat Cover Dispenser: Stainless steel, surface-mounted, reloading by concealed opening at base, tumbler lock.

1. Products:
    a. Bobrick #B221.
    b. Substitutions: Section 01 60 00 - Product Requirements.

J. Grab Bars: Stainless steel, peened surface.
1. Heavy Duty Grab Bars: peened surface. Floor supports are acceptable if necessary to achieve load rating.
    a. Push/Pull Point Load: Minimum 1000 pound-force (4448.2 N), minimum.
    b. Dimensions: 1-1/2 inch (38 mm) outside diameter, minimum 0.125 inch (3.17 mm) wall thickness, exposed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
    c. Length and Configuration: As indicated on drawings.
    d. Products:
        1) Bobrick B--6806.
        2) Substitutions: Section 01 60 00 - Product Requirements.

K. Purse Shelf: Fold-down, with spring-loaded hinge designed to automatically return shelf to vertical position when not in use; 0.03 inch (0.8 mm) satin-finished stainless steel, with 1/4 inch (6 mm) rolled or 1/2 inch (12 mm) channel edge at shelf front.
1. Products:
    a. Bobrick #B683 x 24".
    b. Substitutions: Section 01 60 00 - Product Requirements.

L. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
1. Products:
    a. Back-to-back partition mounting, Bobrick #B-4354.
    b. Single side, Contura Series, Bobrick # B-4354.
    c. Recessed, Contura Series, Bobrick #B-4353.
    d. Substitutions: Section 01 60 00 - Product Requirements.

## 2.05 INSTITUTIONAL SECURITY AND LIGATURE-RESISTANT TOILET AND BATH ACCESSORIES

A. Toilet Paper Holder: Single roll, recessed unit with beveled wall flange, satin finish stainless steel, spring-loaded spindle button type for standard toilet paper rolls. Install with tamper-resistant screws.
1. Products:

B. Paper Towel Holder: Folded paper type, single bay, satin finish stainless steel, surface-mounted, with open bays as refill indicators. Install with tamper-resistant screws.
1. Capacity: 250 C-fold minimum per bay.

C. Mirrors: Unframed, Type 400 polished stainless steel mirror; exposed front mount.
1. Products:
    a. Ketcham Medicine Cabinets, a Division of Fred Silver and Company, Inc; Stainless Steel Washroom Mirrors: www.ketchamcabinets.com/#sle.
    b. Substitutions: Section 01 60 00 - Product Requirements.

D. Grab Bars: Type 304 stainless steel, peened surface with closure plate.
1. Standard Duty Grab Bars:
    a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.
    b. Dimensions: 1-1/2 inch (38 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar; 14 gauge stainless steel "L" shaped closure plate with wall mounting flange welded to bottom of tube to prevent ligature. Install grab bar and closure plate with tamper-resistant screws through grab bar circular mounting flange and wall flange of flat closure.
    c. Length and Configuration: As indicated on drawings.

E. Wall-Mounted Soap Dish: Satin finish stainless steel, recessed with beveled wall flange and raised dimples in soap cavity. Install with plaster flange.

## 2.06 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Shower Curtain Rod: Stainless steel tube, 1 inch (25 mm) outside diameter, 0.04 inch (1.0 mm) wall thickness, satin-finished, with 3 inch (75 mm) outside diameter, minimum 0.04 inch (1.0 mm) thick satin-finished stainless steel flanges, for installation with exposed fasteners.

B. Shower Curtain:
   1. Material: Opaque vinyl, 0.008 inch (0.2 mm) thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
   2. Material: Cotton, machine washable, and mildew-resistant.

C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, swing-down legs, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand seat.
   1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of white color.
   2. Size: ADA Standards compliant.
   3. Products:
      a. Seachrome Corporation; Accessibility Seats, L-Shaped Transfer with Swing-down Legs, Reversible: www.seachrome.com/#sle.
      b. Substitutions: Section 01 60 00 - Product Requirements.

D. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.

E. Towel Pin: Stainless steel, 3-3/8 inch (85 mm) extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.
   1. Products:
      a. Bobrick #B-677.
      b. Substitutions: Section 01 60 00 - Product Requirements.

F. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
   1. Products: Ives #510C.
      a. Substitutions: Section 01 60 00 - Product Requirements.

## 2.07 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
   1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
   2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
   3. Color: White.
   4. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.

## 2.08 ELECTRIC HAND/HAIR DRYERS

A. Electric Hand and Hair Dryers: Traditional fan-in-case type, with downward fixed nozzle.
   1. Operation: Automatic, sensor-operated on and off.
   2. Mounting: Wall-mounted - surface.
   3. Cover: Stainless steel with brushed finish.
      a. Tamper-resistant screw attachment of cover to mounting plate.
   4. Runtime as Hair Dryer: 80 seconds, nominal.
   5. Supply Voltage: As indicated on drawings.
   6. Warranty: 3 years.
   7. Electric Hand Dryer Products:
      a. Basis of Design: Excel Dryer Inc; ThinAir Hand Dryer: www.exceldryer.com/#sle.
      b. Substitutions: Section 01 60 00 - Product Requirements.

## 2.09 DIAPER CHANGING STATIONS

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
   1. Material: Polyethylene.
   2. Mounting: Surface.
   3. Color: As selected.
   4. Minimum Rated Load: 250 pounds (113.4 kg).
   5. Products:
      a. Koala Kare Products, Horizontal mount: Model KB200-00 and Vertical mount: Model KB101-00: www.kolabear.com.
      b. Rubbermaid Commercial Products: www.rubbermaidcommercial.com/#sle.
      c. Substitutions: 01 60 00 - Product Requirements.

## 2.10 UTILITY ROOM ACCESSORIES

A. Mop and Broom Holder: 0.05 inch or manufacturer's standard (1.3 mm) thick stainless steel, Type 304, hat-shaped channel.
   1. Holders: Four spring-loaded rubber cam holders.
   2. Length: 36 inches (900 mm).
   3. Products:
      a. Bobrick #B223 x 36
      b. Substitutions: 01 60 00 - Product Requirements.

## 2.11 MISCELLANEOUS

A. Break Room Garbage Receptacle: Round Open Top Stainless Steel Trash Can - 30 Gallon
   1. High gloss stainless steel resists fingerprints and smudges.
   2. Liner notch holds bags in place. Convenient side handles and rubber feet.
      a. Liners: Drawstring 30 Gallon Liners.
   3. Size: 19" Diam. x 32" H
   4. Products:
      a. Uline, H-11608; www.uline.com
      b. Substitutions: 01 60 00 - Product Requirements.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

## 3.02 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
   1. Grab Bars: As indicated on drawings.
   2. Other Accessories: As indicated on drawings.

## 3.03 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

**END OF SECTION 10 28 00**

## SECTION 10 43 00
## EMERGENCY AID SPECIALTIES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Automated external defibrillators (AEDs).

B. Accessories.

### 1.02 DEFINITIONS

A. Automated External Defibrillator (AED): A Food and Drug Administration (FDA)-approved portable device, which automatically analyzes the heart rhythm and recognizes the presence of ventricular fibrillation and/or tachycardia. If defibrillation is warranted, the AED automatically charges and prompts (visual and/or audio) the operator to deliver an electrical shock.

### 1.03 REFERENCE STANDARDS

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide AED operational features, color and finish, anchorage details, and installation instructions.

C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

E. Maintenance Data: Include test schedules and recertification requirements.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Automated External Defibrillators (AEDs):
   1. Philips Medical Systems: www.usa.philips.com/#sle.
   2. Stryker Corporation; HeartSine samaritan PAD 350P Defibrillator - PAD 350p: www.stryker.com/#sle.
   3. ZOLL Medical Corporation: www.zoll.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 ACCESSORIES

A. Floor Signs:
   1. Floor Sign: 17-1/2 inch (445 mm) diameter vinyl sign with "AED" and AED icon.
   2. Manufacturers:
      a. Brimar Industries, Inc: www.brimar.com/#sle.
      b. Insite Solutions, LLC: www.stop-painting.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

### PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

### 3.02 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust cabinet doors to operate smoothly without binding. Verify that alarms and integral locking devices operate properly.

C. On completion of cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

### 3.03 CLOSEOUT ACTIVITIES

A. Demonstrate proper operation of AED to Owner's designated representative.

**END OF SECTION 10 43 00**

## SECTION 10 44 00
## FIRE PROTECTION SPECIALTIES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire blankets.

C. Fire extinguisher cabinets.

D. Accessories.

### 1.02 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

B. FM (AG) - FM Approval Guide; Current Edition.

C. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

D. UL (DIR) - Online Certifications Directory; Current Edition.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features.

C. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

### 1.04 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. Ansul, a Tyco Business: www.ansul.com/#sle.
   3. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
   4. Oval Brand Fire Products: www.ovalfireproducts.com/#sle.
   5. Potter-Roemer: www.potterroemer.com/#sle.
   6. Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
   3. Larsen's Manufacturing Co: www.larsensmfg.com/#sle.
   4. Oval Brand Fire Products: www.ovalfireproducts.com/#sle.
   5. Potter-Roemer: www.potterroemer.com/#sle.
   6. The Williams Brothers Corporation of America: www.wbdoors.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Cartridge Operated: Spun shell.
   2. Class: A:B:C type.
   3. Temperature range: Minus 65 degrees F (Minus 54 degrees C) to 120 degrees F (49 degrees C).

C. FE-36 Clean Agent Type Fire Extinguishers: Stainless steel tank, with pressure gauge.
   1. Class: B:C type.
   2. Size: 2.5 pound (1.13 kg).
   3. Finish: Satin chrome.
   4. Temperature Range: Minus 40 degrees F (Minus 40 degrees C) to 120 degrees F (49 degrees C).

**2.03 FIRE EXTINGUISHER CABINETS**

A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.

B. Fire Rated Cabinet Construction: One-hour fire rated.

C. Cabinet Configuration: Recessed type.
   1. Size to accommodate accessories.
   2. Trim: Flat square edge, with manufacturer's standard wide face.
   3. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.

D. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.

E. Door Glazing: Float glass, clear, 1/8 inch (3 mm) thick, and set in resilient channel glazing gasket.

F. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

G. Fabrication: Weld, fill, and grind components smooth.

H. Finish of Cabinet Exterior Trim and Door: Satin chrome.

I. Finish of Cabinet Interior: White colored enamel.

**2.04 ACCESSORIES**

A. Fire Blanket: Fire retardant treated wool; red, 62 by 84 inch (1575 by 2135 mm) size.

B. Extinguisher Brackets: Formed steel, chrome-plated.

C. Lettering: “FIRE EXTINGUISHER” decal, or vinyl self-adhering, prespaced black lettering in accordance with authorities having jurisdiction (AHJ).

D. Floor Signs:
   1. Floor Sign: 17-1/2 inch (445 mm) diameter vinyl sign with "DO NOT BLOCK FIRE EXTINGUISHER", directional arrow, and fire extinguisher icon.
   2. Manufacturers:
      a. Brimar Industries, Inc: www.brimar.com/#sle.
      b. Insite Solutions, LLC: www.stop-painting.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Install in accordance with manufacturer's instructions.

**END OF SECTION 10 44 00**

**SECTION 10 51 13**
**METAL LOCKERS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Metal lockers.

B. Locker benches.

C. Owner supplied items

### 1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's published data on locker construction, sizes, and accessories.

C. Shop Drawings: Indicate locker plan layout, numbering plan and combination lock code.

D. Manufacturer's Installation Instructions: Indicate component installation assembly.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Metal Lockers:
   1. Basis of Design: Donnegan Systems, Inc.; First Responder Duty Lockers, Evidence Storage Lockers, and Weapons Lockers: www.donegan.com
   2. Art Metal Products: www.artmetalproducts.com/#sle.
   3. DeBourgh Manufacturing Co: www.debourgh.com/#sle.
   4. Lockers MFG: www.lockersmfg.com/#sle.
   5. Fascoe Security Products; Police Personel Lockers: www.fascosecurityproducts.com
   6. Lyon Workspace Products: www.lyonworkspace.com/#sle.
   7. Republic Storage Systems Co: www.republicstorage.com/#sle.
   8. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 LOCKER APPLICATIONS

A. Owner supplied lockers:
   1. Contractor will disassemble, store, transport and reinstall lockers designated to be reused from current police station and install where indicated on the drawings.
   2. Police gear lockers: total - 8.
   3. Evidence lockers: total - 1.
   4. Weapons lockers: total - 1.

B. Evidence Lockers
   1. Construction:
      a. 16 gauge all welded steel construction
      b. Individual compartments & master front door
      c. Heavy duty piano hinges
      d. Configuration and Dimensions: as indicated on drawings.

C. Weapons Lockers
   1. Construction:
      a. 16 gauge all welded steel construction

b. Individual compartments & master front door
c. Heavy duty piano hinges
d. Configuration and Dimensions: as indicated on drawings.

D. First Responder Duty Lockers: Metal lockers, free-standing wardrobe unit with drawer base.
1. Wardrobe Unit:
a. Width: 18 inches (457 mm).
b. Depth: 18 inches (457 mm).
c. Height: 73 inches (1.854 m).
2. Configuration: Single tier.
3. Drawer Base:
a. Width: 18 inches (457 mm).
b. Depth: 34 inches (864 mm).
c. Height: 17 inches (431 mm).
4. Fittings: Size and configuration as indicated on drawings.
5. Ventilation: Perforated side panels, doors, and back panels; integrated fan system.
6. Latching: Three-point, Cremone latching, with padlockable turn handle.
7. Locking: Padlock hasps, for padlocks provided by Owner.

**2.03 METAL LOCKERS**

A. Locker Case Construction:
1. Heavy-Duty, Welded Construction: Made of formed and welded together sheet steel; metal edges finished smooth without burrs; baked enamel or powder coat finished inside and out.
a. Locker Body Components: Formed and flanged from steel sheet of the following type and minimum thicknesses:
1) Perforated Steel Sheet: Commercial Steel (CS), Type B, supplied for exposed applications and complying with ASTM A1008/A1008M and the following:
(a) Perforations: Manufacturer's standard pattern of square holes.
2) Body and Shelves: 16 gauge, 0.0598 inch (1.52 mm).
3) Backs: 18 gauge, 0.0478 inch (1.21 mm).
4) Base: 18 gauge, 0.0478 inch (1.21 mm).
(a) Height: 4 inches (100 mm).
b. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
1) Door Frame: 16 gauge, 0.0598 inch (1.52 mm), minimum.
c. Where ends or sides are exposed, provide flush panel closures.
d. Provide filler strips where indicated or required, securely attached to lockers.

B. Doors: Channel edge; welded construction, manufacturer's standard stiffeners, grind and finish edges smooth.
1. Door Thickness: 16 gauge, 0.0598 inch (1.52 mm), minimum.
2. Form recess for operating handle and locking device.

C. Latches and Door Handles: Manufacturer's standard.
1. Latching: Manufacturer's standard for locking arrangement selected.
a. Three-Point/Three-Sided Cremone Latch.
1) Latching mechanism operated by a steel handle welded to a three-point Cremone-type assembly.
2) Latching rods, 3/8 inch (9.5 mm) diameter, engage top and bottom edge of locker frame. 3/16 inch (4.8 mm) thick center latch engages door jamb.

D. Hinges: Continuous piano hinge with powder coat finish to match locker color.

E. Sloped Top: 20 gauge, 0.0359 inch (0.91 mm), with closed ends.

F. Trim: 20 gauge, 0.0359 inch (0.91 mm).

G. Coat Hooks: Stainless steel or zinc-plated steel.

H. Locks: Locker manufacturer's standard type indicated in Applications article above.

**2.04 LOCKER BENCHES**

A. Locker Benches: Stationary type; bench top of laminated birch; painted steel pedestals.
   1. Accessibility: Comply with ICC A117.1 and ADA Standards.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Place and secure on prepared base.

C. Install lockers plumb and square.

D. Install fittings if not factory installed.

E. Replace components that do not operate smoothly.

**END OF SECTION 10 51 13**

## SECTION 10 56 13
## METAL STORAGE SHELVING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Case type shelving.

B. Shelving accessories.

### 1.02 RELATED REQUIREMENTS

A. Section 10 56 26 - Mobile Storage Shelving: Installation of metal storage shelving on mobile carriages.

### 1.03 REFERENCE STANDARDS

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Rated uniform shelf loads.
   2. Details of shelving assemblies, including reinforcement.
   3. Accessories.

C. Test Reports: Provide independent agency test reports documenting compliance with specified structural requirements.

D. Shop Drawings: Indicate location, type, and layout of shelving, including lengths, heights, and aisle layout, and relationship to adjacent construction.
   1. Indicate methods of achieving specified anchoring requirements.

E. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and finishes.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect for dents, scratches, or other damage. Replace damaged units.

B. Store in manufacturer's unopened packaging until ready for installation.

C. Store under cover and elevated above grade.

### 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide one year manufacturer warranty covering defects of manufacturing and workmanship and rust and corrosion.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Case Type Shelving:
   1. Spacesaver Corporation: www.spacesaver.com/#sle. - Basis of Design

B. Case Type Shelving Cabinets:
   1. Spacesaver Corporation High Density Mobile Storage (HDMS) Systems: www.spacesaver.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 SHELVING - GENERAL

A. See drawings for layout and sizes.

## 2.03 CASE TYPE SHELVING

A. Case Type Shelving: Steel, closed sides, with shelving brackets, shelving surfaces, and accessories as specified.
   1. Unit Width: 24 inches (610 mm), overall.
   2. Shelf Capacity: Uniform distributed load of 50 psf (2.4 kPa), minimum.
   3. Shelf Deflection: L/140, maximum, under specified uniform load.
   4. Adjustability of Shelving: At intervals of 6 inches (150 mm) on center.
   5. Shelves per Unit: As indicated on drawings.
   6. Finish: Baked enamel, medium gloss.
   7. Color: As selected by Architect from manufacturer’s standard range.
   8. Provide single-face and double-face units where indicated.
   9. Number of Units: As indicated on drawings.

B. Case Construction: Formed sheet metal comprising vertical support members and enclosure panels.
   1. Shelf Support Members: 16 gauge, 0.0598 inch (1.52 mm), minimum; manufacturer's standard profile.
   2. Face Width of Exposed Vertical Supports: 2 inches (51 mm), maximum.
   3. Panels: 24 gauge, 0.0239 inch (0.61 mm), minimum.
   4. Connecting Hardware: Manufacturer's standard.

C. Shelves: Formed sheet metal, finished on all surfaces with slots for dividers.
   1. Thickness: 16 gauge, 0.0598 inch (1.52 mm), minimum.
   2. Shelf Edge Profile: Extending 3/4 inch (19 mm), maximum, below top surface of shelf.

## 2.04 ACCESSORIES

A. Kick Plates: Formed sheet metal; enclose open space between bottom shelf and floor on all front sides and open ends; finished to match.

B. Label Holders: Steel, attached to front face of shelf.
   1. Size: 2-1/4 by 3/4 inches (56 by 20 mm).
   2. Finish: Manufacturer’s standard.
   3. Mounting: Slide-on.

# PART 3 EXECUTION

## 3.01 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

## 3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install shelving with shelf surfaces level and vertical supports plumb; adjust feet and bases as required.

## 3.03 CLEANING

A. Clean shelving and surrounding area after installation.

## 3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION 10 56 13**

## SECTION 10 56 26
## MOBILE STORAGE SHELVING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Mechanically assisted mobile storage shelving systems.

### 1.02 RELATED REQUIREMENTS

A. Section 10 56 13 - Metal Storage Shelving: Shelving to be mounted on mobile carriages.

### 1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. System components.
   2. Accessories.
   3. Substrate preparation instructions and recommendations.
   4. Storage and handling requirements and recommendations.
   5. Installation methods.

C. Shop Drawings: Indicate location, type, and layout of mobile storage shelving system, including lengths, heights, and aisle layout, and relationship to adjacent construction.
   1. Indicate location and configuration of rails.
   2. Indicate method of installation and configuration for shelving mounted on carriages.
   3. Provide location and details of anchorage devices to be embedded in or fastened to the structure.

D. Selection Samples: For each finish product specified, provide color chips representing manufacturer's full range of available colors and finishes.

E. Design Data: Provide design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.

F. Executed warranty.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engage an experienced manufacturer who is ISO 9001 certified for the design, production, installation and service of carriage mounted high-density mobile storage units and support rails. Furnish certificate attesting manufacturer’s ISO 9001 quality system registration

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
   1. Manufacturer must have a local dedicated Area Contractor / Dealer / Distributor actively servicing the location, with a proven track record of installing and servicing the manufacturers mechanical operated high-density storage systems.
   2. Submit documentation outlining the manufacturer’s servicing Area Contractor/ Dealer/ Distributor’s long-term commitment to the area, confirming that Area Contractor/ Dealer/ Distributor has the business plan, and financial strength to continue to service the high density storage system installation over its service life.
   3. System must be manufactured in the USA.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum two years of documented experience and approved by manufacturer.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect for dents, scratches, or other damage. Replace damaged components.

B. Store in manufacturer's unopened packaging until ready for installation.

C. Store under cover and elevated above grade.

## 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer Warranty: Provide 1-year manufacturer warranty for rust, corrosion, and manufacturing defects. Complete forms in Owner's name and register with manufacturer.

# PART 2 PRODUCTS

## 2.01 MOBILE STORAGE SHELVING SYSTEMS - GENERAL

A. System Description: High-density movable shelving system consisting of shelving units mounted on rail-guided wheeled carriages.
   1. Carriage Operation: Mechanically assisted.
   2. Carriage Capacity: Equivalent to basis of design.
   3. Rail Mounting: On raised floor with finished floor flush with top of rails.

B. Components:
   1. Carriages: Rectangular steel frames of type and size required for selected system.
   2. Wheels: Cold rolled steel; dual flanged.
   3. Rails: Cold rolled steel; type and size to carry loads imposed by system.
      a. Rail shall be ASTM/AISI 4140 steel bar 4 1/2” (114mm) wide x 3/8” (9.5mm) high with black zinc finish. Rail edges shall be beveled down to a maximum of 3/16” (4.8mm) to allow for the rail to be transverse by material handling equipment. Rail shall disperse the wheel point loads to structural slab. Rail shall have two permanently mounted floor anchors maximum 15” (381mm) on center. Rails shall be installed on top of concrete slab and laid in a manor such that rail joints are staggered across all adjacent rail runs. Rail and carriage design allows concrete slab to be unleveled at the following maximum variation of 3/16” (4.8mm) over any 2’ (0.6m) rail run and 1/4” (6.4mm) maximum variation over any 10’ (3.04m) rail run.
   4. Carriages:
      a. Assembled structural steel carriage base will have a minimum capacity of 7,000 lbs. (3,175 kg) Each wheel assembly shall be equipped with two wheels, minimum 5” (127mm) diameter steel wheels. Wheels are equipped with two permanently lubricated and shielded radial ball bearings. Wheel capacity 3,500 lbs (1,587kg) each. Wheels have solid steel axles of 1” in (25.4mm) diameter. Wheels shall be dual flange, all wheel guided. All carriage sections between wheel assemblies have integral cross bracing to maintain accepted tolerances for function of systems. Side profiles shall provide and maintain wheel assembly alignment and squareness. These profiles shall be pre-drilled at the factory but are bolted, and assembled on the job site as integral carriage members.
   5. Anti-Tip Device: Provide manufacturer's standard rail device to prevent tipping of system.
   6. Shelving Units: As specified in Section 10 56 13.

C. Accessories:
   1. Anchors and Leveling Screws: Types and sizes recommended by manufacturer for specified rail mounting and floor system.
   2. Bumpers: Manufacturer's standard rubber stops.

## 2.02 MECHANICALLY ASSISTED MOBILE STORAGE SHELVING SYSTEMS

A. Basis of Design: Spacesaver Corporation; Xpress DEK High-Density Mobile Shelving: www.spacesaver.com/#sle.
   1. Other Acceptable Manufacturers:
      a. Montel: www.montel.com/#sle.

b. MMI Storage Solutions: www.mmistorage.com/
c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Drive System: Provide uniform movement of the carriage without drifting or jerking.
1. Chain and sprocket system with full length torque resistant steel shaft.
2. Provide minimum two wheels per rail for each carriage, direct-driven on one side.
3. All system components shall be selected to ensure a smooth, even movement along the entire carriage length. Drive system gearing shall be designed to permit 1 lb. of force applied to the drive handle to move a minimum of 4,000 lbs. of load.
4. All bearings used in the drive mechanism shall be permanently shielded and lubricated
5. Design: Provide drive system which prevents carriage whipping, binding and excessive wheel/rail wear under normal operation.
a. If line shafts are used, all wheels on one side of carriage shall drive.
b. If synchronized drives are used, a minimum of one wheel assembly driving both sides of carriage at center location required. Drive shaft shall exhibit no play or looseness over the entire length of that assembly.
c. Shafts: Solid steel tube.
d. Shaft Connections: Secured couplings.
e. Bearing Surfaces: Provide rotating load bearing members with ball or roller bearings. Provide shafts with pillow block or flanged self-aligning type bearings.

C. Movement Controls: Triple arm operating wheels with rotating hand knobs shall be provided on the accessible (drive) ends of shelf units, centered on the stanchion, located approximately 40 inches (1051MM) from the base of each unit to permit units to be moved to create a single aisle opening. Turning the handle transmits power through chain drive to drive wheels on each carriage.

D. Control: Three-spoke operating handle with manual locking latch.
1. Minimum Gear Ratio: 1 lbf (4.4 N) to move a load of 6000 lbs (2722 kgs).

E. Safety Features:
1. Color-coded visual indicators shall provide verification that carriages are in a locked or unlocked mode.
2. A single safety lock button, mounted on each operating wheel hub, will permit moving a carriage in either direction to create a new access aisle when pulled out (unlocked), or locking the carriage when pushed in.

F. Fabrication:
1. General: Coordinate fabrication and delivery to ensure no delay in progress of the Work.
2. Wheels: Provide precision machined and balanced units with permanently shielded and lubricated bearings.

G. Finishes:
1. Colors: Slected from manufacturer's standard available colors as selected by Architect.
2. Paint Finish: Provide factory applied electrostatic powder coat paint.
3. Finish is to be archive quality, non-reactive, solvent-free, baked polyester powder coating and will have no potential off-gassing
4. Solvent based wet-spray paint finishes on any components in the entire installation are unacceptable.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that substrate is in proper condition to install rails and flooring system per manufacturer's requirements.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

## 3.02 INSTALLATION

A. General: Install system components and accessories in accordance with manufacturer's printed instructions.

B. Position system components level and plumb within manufacturer's specified tolerances.

C. Anchor floor system to structure as indicated on drawings.

D. Extend rails under stationary shelving units.

E. Position carriages ensuring wheels align properly on rails. Fasten multiple carriages together forming a single movable base.

F. Install shelving with shelf surfaces level and vertical supports plumb; fasten to carriage supports with vibration-proof fasteners.

## 3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Remove and replace components which are shipped, scratched, or otherwise damaged and which do not match adjoining work. Provide new matching units, installed as specified and in manner to eliminate evidence of replacement.

## 3.04 ADJUSTING

A. Adjust mobile storage shelving components and accessories to provide for smooth operation of system.

## 3.05 CLEANING

A. Immediately upon completion of installation, clean components and surfaces. Remove surplus materials, rubbish and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition

B. Clean shelving and surrounding area after installation.

## 3.06 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.

B. Training: Train Owner's personnel on operation, adjustment, and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Instructor: Manufacturer's authorized representative.
   3. Location: At project site.

## 3.07 PROTECTION

A. Protect installed system from subsequent construction operations.
   1. Advise Owner of additional protection needed to ensure that system will be without damage or deterioration at time of substantial completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION 10 56 26**

**SECTION 10 73 16.13**
**METAL CANOPIES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Attached metal canopies.

### 1.02 RELATED REQUIREMENTS

A. 07 21 60 - Structural Thermal Break

### 1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.

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 B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

G. ASTM B308/B308M - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles; 2020.

H. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube; 2020.

I. 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; 2023.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit product data sheets, including material descriptions and finishes, and preparation instructions and recommendations.

C. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing profiles, sections of components, finishes, and fastening details.

D. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.

### 1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
   1. Comply with applicable code for submission of design calculations as required for acquiring permits.
   2. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide data as requested.

B. Perform steel work in accordance with AISC 303.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site ready for erection.

B. Package using methods that prevent damage during shipping and storage on site.

C. Store materials under cover and elevated above grade.

## 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Metal Canopies: Correct defective work within a two year period after Date of Substantial Completion.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. Metal Canopies:
   1. Basis of Design: MASA Architectural Canopies; Extrudeck
      a. www.architecturalcanopies.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 METAL CANOPIES

A. Shop Fabricated Aluminum Canopy

B. Configuration: Layout and dimensions, column layout, canopy clearance, fascia profile, and roof covering design as indicated on drawings.
   1. Installation: Face-mounted to building structure.
   2. Structural Framing System: Aluminum.
   3. Covering Material: Aluminum.
   4. Drainage Concept: Water collected in decking conducted into perimeter drain beams and discharged through downspouts.

C. Performance Requirements:
   1. Design and fabricate metal canopy system to resist wind, snow, live, and seismic loads without failure, damage, or permanent deflection in accordance with ASCE 7:
      a. Loads: As indicated on drawings.
   2. Thermal Movement: Design canopy system to accommodate thermal movement caused by ambient temperature range of 120 degrees F (49 degrees C) and surface temperature range of 180 degrees F (82 degrees C) without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects on assembly components.

## 2.03 COMPONENTS

A. Structural Aluminum Framing: Alloy and temper 6063-T5, 6063-T6, or 6061-T6.
   1. Extruded Shapes and Tubes: ASTM B221 (ASTM B221M).
   2. Rolled or Extruded Structural Shapes: ASTM B308/B308M.
   3. Extruded Structural Pipe and Tube: ASTM B429/B429M.
   4. Sheet and Plate: Alloy 5052, 5005, or 6061-T651, ASTM B209/B209M.

B. Covering:
   1. Aluminum Decking:
      a. Interlocking extruded aluminum decking modules.
         1) Extruded Decking: ASTM B221 (ASTM B221M), Alloy and temper 6005-T5, 6061-T6, or 6063-T6.

C. Fascia: Manufacturer's standard flat profile.

## 2.04 SHOP FABRICATION

A. Provide a complete system ready for erection at project site.

B. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.

C. Weld steel members in accordance with AWS D1.1/D1.1M.

D. Fabricate connections for bolt, nut, and washer connectors.

## 2.05 FINISHES

A. Aluminum Framing and Decking:
   1. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41, clear anodic coating not less than 0.7 mils (0.018 mm) thick.

## 2.06 ACCESSORIES

A. Structural Bolts: ASTM F3125/F3125M, Grade A325, minimum 3/4 inch (19 mm) diameter.

B. Trim, Closure Pieces, and Flashings: Same material, thickness and finish as sheet metal decking; factory-fabricated to required profiles.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Examine substrates and site area for conditions that might prevent satisfactory installation.

B. Verify that foundation, electrical utilities, and placed anchors are in correct position.

C. Verify that bearing surfaces are ready to receive this work. - See section 07 21 60

D. Do not proceed with installation until all conditions are satisfactory.

## 3.02 INSTALLATION - FRAMING

A. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation.

B. Do not field cut or alter structural members without approval.

## 3.03 INSTALLATION - CANOPY COVERING

A. Install in accordance with manufacturer's instructions.

B. Fasten metal decking to metal support members, aligned level and plumb.

C. Install fascia panels, trim, and flashing.

D. Separate dissimilar metals using concealed bituminous paint.

E. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

## 3.04 CLEANING

A. Clean surfaces of dust and debris; follow manufacturer's cleaning instructions for the finish used.

**END OF SECTION 10 73 16.13**

**SECTION 11 30 13**
**APPLIANCES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Kitchen appliances.

### 1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of equipment specified.

C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

### 1.03 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.

C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.

## PART 2 PRODUCTS

### 2.01 KITCHEN APPLIANCES

A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.

B. Refrigerator: Free-standing, side-by-side, and frost-free.
   1. Capacity: Total minimum storage of 22 cubic ft (0.62 cu m); minimum 15 percent freezer capacity.
   2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by U.S. Department of Energy (DOE).
   3. Features: Include glass shelves, automatic icemaker, light in freezer compartment, and in-door water and ice dispenser.
   4. Exterior Finish: Stainless steel, color gray.
   5. Manufacturers:
      a. GE Appliances; GE Profile PYE22KYNFS: www.geappliances.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Microwave: Drawer Microwave.
   1. Capacity: 1.2 cubic ft. (0.034 cu m).
   2. Power: 1000 watts.
   3. Features: Include turntable, built-in trim kit, and anti-tip block.
   4. Exterior Finish: Stainless Steel.
   5. Manufacturers:
      a. GE Appliances; GE Profile PWL 1126SWSS: www.geappliances.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

## 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 CLEANING

A. Remove packing materials from equipment and properly discard.

B. Wash and clean equipment.

**END OF SECTION 11 30 13**

**SECTION 12 24 00**
**WINDOW SHADES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Interior motorized roller shades.

### 1.02 REFERENCE STANDARDS

### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.

B. Sequencing:
   1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
   2. Do not install shades until final surface finishes and painting are complete.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

D. Selection Samples: Include fabric samples in full range of available colors and patterns.
   1. Motorized Shades: Include finish selections for controls.

E. Verification Samples: Minimum size 6 inches (150 mm) square, representing actual materials, color and pattern.

F. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

G. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this type with minimum 3 years of documented experience with shading systems of similar size and type.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

### 1.07 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

### 1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: One year.
   2. Electric Motors: One year.

3. Electronic Control Equipment: One year.
4. Fabric: One year.
5. Aluminum and Steel Coatings: One year.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Interior Motorized Roller Shades, Motors and Motor Controls:
   1. Basis of Design: Draper, Inc; FlexShade ReCharge: www.draperinc.com/#sle.
   2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
   3. Lutron Electronics Co., Inc: www.lutron.com/#sle.
   4. MechoShade Systems LLC: www.mechoshade.com/#sle.
   5. Rollease Acmeda Contract: www.rolleaseacmedacontract.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 ROLLER SHADES

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Interior Roller Shades - Basis of Design: Draper, Inc; FlexShade Recharge: www.draperinc.com/#sle.
   1. Description: Double roller, motor-operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and other components necessary for complete installation.
      a. Drop Position: Regular roll.
      b. Mounting: Window jamb mounted - inside, between jambs.
      c. Size: As indicated on drawings.
   2. Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
      a. Hardware Type: Mounting end caps with fascia.
      b. Double Roller Mounting: Configured for light-filtering and room-darkening shades in one opening.
         1) Light-Filtering Fabric: Room-side of opening.
         2) Room-Darkening Fabric: Glass-side of opening.
   3. Multiple Shade Operation: Provide hardware as necessary to operate more than one shade using a single motor.
   4. Roller Tubes: As required for type of shade operation; designed for removal without removing mounting hardware.
      a. Material: Extruded aluminum or steel, with wall thickness and material selected by manufacturer.
      b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
      c. Fabric Attachment: Utilize double-sided adhesive tape.
      d. Capable of being removed and reinstalled without affecting roller shade limit adjustments.
   5. Hembars: Designed to maintain bottom of shade straight and flat, selected from manufacturer's standard options.
   6. Shade Motor: Battery-operated radio technology (wireless) motor with integral lithium-ion battery rechargeable via 12V power adapter or solar panel.
   7. Intelligent Intelliflex I/O Motor:
      a. Supports bidirectional network communication; power and communication distributed to network via network device connectors without requiring external power supplies.
      b. Supports sensor integration and event scheduling via sensor/schedule interface, interface with third-party control systems via A/V gateway, integration with building

management systems via IP, and solar-tracking controls.

8. Intelligent RS485 Motor:
   a. Supports bidirectional network communication with individual unique address; capable of storing 16 configurable group addresses for group control.
   b. Capable of alignment within accuracy of plus/minus 0.8 inch (2 mm).
   c. Supports positioning from 0 to 100 percent in 0.5 percent increments and 16 customizable stop points.
9. Accessories:
   a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to mounting end caps, without exposed fasteners; powder coat finish.
      1) Color: as selected from manufacturer's standard finishes.
   b. Fasteners: Noncorrosive, and as recommended by shade manufacturer.

**2.03 SHADE FABRIC**

A. Fabric - Type _____: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.

**2.04 ROLLER SHADE FABRICATION**

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: As recommended in writing by manufacturer.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. Start of installation shall be considered acceptance of substrates.

**3.02 INSTALLATION**

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

**3.03 CLEANING**

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

**3.04 CLOSEOUT ACTIVITIES**

A. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

B. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

**3.05 PROTECTION**

A. Protect installed products from subsequent construction operations.

**END OF SECTION 12 24 00**

**SECTION 12 35 53.13**
**METAL LABORATORY CASEWORK**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Custom metal cabinets and cabinet hardware.
   1. Location: Evidence Processing Room

B. Countertops.

C. Laboratory sinks.

D. Service fittings and outlets.

### 1.02 REFERENCE STANDARDS

A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM D522/D522M - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings; 2017 (Reapproved 2021).

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

F. SEFA 2 - Installations; 2010.

G. SEFA 3 - Laboratory Work Surfaces; 2020.

H. SEFA 7 - Laboratory Fixtures; 2021.

I. SEFA 8M - Laboratory Grade Metal Casework; 2020.

### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of casework with related items.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Details of materials, component dimensions and configurations, construction details, joint details, attachments; manufacturer's catalog literature on hardware and keying, accessories, and service fittings, if any.

C. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors and reinforcements placement dimensions and tolerances, clearances required, and utility locations, if any. Include coordinated information for laboratory equipment specified in another section and/or furnished by Owner.

D. Test Reports: Independent laboratory reports showing compliance with chemical and physical resistance requirements for casework finish.

E. Maintenance Data: Manufacturer's recommendations for care and cleaning.

F. Finish touch-up kit for each type and color of materials provided.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by

manufacturer.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.

### 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year warranty against defects. Complete forms in Owner's name and register with manufacturer. Covered defects include, but are not limited to:
   1. Ruptured, cracked, or stained finish coating.
   2. Discoloration, or lack of finish integrity.
   3. Cracking or peeling of finish.
   4. Weld or any other structural failure.
   5. Failure of hardware.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Metal Laboratory Casework:
   1. Basis of Design: Donnegan Systems, Inc. www.donegan.com
   2. Duralab Corporation: www.duralabcorp.com/#sle.
   3. Multi-Lab: www.multilab.net/#sle.
   4. Symbiote Inc: www.symbiote.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 METAL LABORATORY CASEWORK

A. Casework: Die-formed metal sheet; each unit self-contained and not dependent on adjacent units or building structure for rigidity; factory-fabricated, factory-assembled, and factory-finished.
   1. Style: Flush overlay - square edge.
   2. Primary Cabinet Material: Stainless steel.
   3. Stainless Steel Sheet Metal:
      a. Gables, Front and Back Panels, Gusset Plates, Aprons, and Rails: 18 gauge, 0.0478 inch (1.21 mm) minimum thickness.
      b. Drawers, Cabinet Floors, Shelves, Filler Panels and Drawer Dividers: 20 gauge, 0.0359 inch (0.91 mm) minimum thickness.
      c. Backing Sheet to Door and Door Fronts: 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
   4. Structural Performance: In addition to the requirements of SEFA 3, SEFA 7 and SEFA 8M, provide components that safely support the following minimum loads, without deformation or damage:
      a. Base Units: 500 pounds per linear foot (744 kg/linear m) across the cabinet ends.
      b. Suspended Units: 300 pounds (136 kg), minimum, static load.
      c. Drawers: 125 pounds (57 kg).
      d. Hanging Upper Cases: 300 pounds (136 kg).
      e. Shelves: 100 pounds (45 kg).
   5. Corners and Joints: Without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
   6. Edges and Seams: Smooth. Form counter tops, shelves, and drain boards from continuous sheets.
   7. Shelf Edges: Turned down 3/4 inch (19 mm) on each side and returned 3/4 inch (19 mm) front and back.
   8. Ends: Close open ends with matching construction.

9. Welding: Electric spot welded; joints ground smooth and flush.
10. Drawers and Doors: Fabricate drawer and door fronts of sandwiched sheets of sheet steel welded together and reinforced for hardware.
    a. Fill with sound-deadening core.
11. Stainless Steel Finish: No.4, brushed finish.
12. Separation: Use bituminous paint or non-conductive tape to coat metal surfaces in contact with cementitious materials, and to separate dissimilar metals.

**2.03 CABINET HARDWARE**

A. Manufacturer's standard styles, and as indicated below.

B. Finish of exposed stainless steel components: No.4 finish.

C. Shelves in Cabinets:
    1. Shelf Standards and Rests: Vertical standards with rubber button fitted rests, satin chromium plated over nickel on base material.

D. Swinging Doors:
    1. Hinges: Offset pin, number as required by referenced standards for width, height, and weight of door.
    2. Catches: Magnetic.
    3. Pulls: Chrome-plated brass wire pulls, 4 inches (102 mm) wide.

**2.04 COUNTERTOPS**

A. Countertops:
    1. Stainless Steel Countertops: , Type 304, stainless steel sheet; 16 gauge, 0.0625 inch (1.59 mm) nominal sheet thickness.
        a. Finish: 4B satin brushed finish.
        b. Exposed Edge Shape: Straight turndown with return; 1-1/2 inch (38 mm) high face, 1/2 inch (12 mm) return to face of case; reinforced with hardwood or steel.
        c. Back and End Splashes: Same material; welded 1/4 inch (6 mm) radius coved joint to countertop; square top edge with 1 inch (25 mm) wide top surface and minimum 1/2 inch (12 mm) turndown.

**2.05 SINKS**

A. Laboratory sinks.
    1. General: integral with countertop.
    2. Sink : Single-bowl.
        a. Outlet: 1-1/2 inch NPS (40 mm DN) outlet with tailpiece.
            1) Placement: Center.

**2.06 SERVICE FITTINGS**

A. General: Comply with requirements of SEFA 7.

B. Water Service Fittings and Fixtures.
    1. Pure Water Fitting :
        a. Valve: Forged or cast brass body, 180 degree inlet - outlet configuration, plastic lining, with polished chrome with clear epoxy coating finish.
        b. Mounting: Deck (Horizontal surface) turret base, with escutcheon.
        c. Inlet: 3/8 inch NPS (10 mm DN) NPT.
        d. Outlet: Manufacturer's standard, with anti-splash serrated hose end.
        e. Gooseneck: Rigid gooseneck, with 6 inch (153 mm) spread, anti-splash serrated hose end.
        f. Handle: Manufacturer's standard self-closing lever knurled handle with color-coded index disc.

## 2.07 MATERIALS

A. Sheet Steel: High-strength low-alloy, cold rolled and leveled unfinished steel sheet, ASTM A1008/A1008M, Class 1 (matte) finish.

B. Stainless Steel Sheet: ASTM A666, Type 304.

C. Sealant For Use in Casework Installation:
   1. Manufacturer's recommended type.

## 2.08 FINISHES

A. Sheet Steel Finish: Having chemical resistance equal to Level 0 (no change) or Level 1 (slight change of gloss or slight discoloration) according to SEFA 8M. Test applied finishes using procedures specified in ASTM D522/D522M.
   1. Coating Type, New Casework: Baked on epoxy; minimum two coats.
   2. Color: As selected from manufacturer's standard selection.
   3. Preparation: Degrease and phosphate etch, and prime.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Perform installation in accordance with manufacturer's instructions and with SEFA 2.

B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.

C. Set casework items plumb and square, securely anchored to building structure, with no distortion.
   1. Base Cabinets: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 3/4 inch (19 mm) leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.

D. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.

E. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch (1.6 mm). In addition, do not exceed the following tolerances:
   1. Variation of Tops of Base Cabinets from Level: 1/16 inch (1.6 mm) in 10 feet (3 m).
   2. Variation of Faces of Cabinets from a True Plane: 1/8 inch (3 mm) in 10 feet (3 m).
   3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch (0.8 mm).
   4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch (1.6 mm).

F. Separate dissimilar metals to prevent galvanic action.

G. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches (407 mm) on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.

H. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

I. Replace units that are damaged, including those that have damaged finishes.

## 3.02 ADJUSTING

A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

## 3.03 CLEANING

A. Clean casework and other installed surfaces thoroughly.

## 3.04 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

B. Protect casework and countertops from ongoing construction activities. Prevent installers from standing on or storing tools and materials on casework or countertops.

C. Repair damage that occurs prior to Date of Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

**END OF SECTION 12 35 53.13**

**SECTION 12 36 00**
**COUNTERTOPS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Wall-hung counters and vanity tops.

C. Sinks molded into countertops.

### 1.02 RELATED REQUIREMENTS

A. Section 12 35 30 - Residential Casework.

### 1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

D. IAPMO Z124 - Plastic Plumbing Fixtures; 2022, with Editorial Revision.

E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

F. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.

G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

H. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. 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. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

### 1.05 QUALITY ASSURANCE

A. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.

4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

## 1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

# PART 2 PRODUCTS

## 2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting self-supporting over structural members.
   1. Flat Sheet Thickness: 1/2 inch (12 mm), minimum.
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Basis of Design: Dupont: www.corian.com/#sle.
         2) Formica Corporation: www.formica.com/#sle.
         3) LG Hausys America, Inc: www.lghausysusa.com/#sle.
         4) Wilsonart: www.wilsonart.com/#sle.
         5) Substitutions: See Section 01 60 00 - Product Requirements.
      b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      c. NSF approved for food contact.
      d. Sinks and Bowls: Integral castings; minimum 3/4 inch (19 mm) wall thickness; comply with IAPMO Z124.
      e. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
      f. Color and Pattern: As indicated on drawings.
   3. Other Components Thickness: 1/2 inch (12 mm), minimum.
   4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch (32 mm) thick; edge profile as indicated on drawings; use marine edge at sinks.
   5. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
   6. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

C. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Flat Sheet Thickness: 1-1/4 inch (32 mm), minimum.
   2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Basis of Design: Cambria Company LLC: www.cambriausa.com/#sle.
         2) Dal-Tile Corporation: www.daltile.com/#sle.

3) Wilsonart: www.wilsonart.com/#sle.
4) MSI, M S International, Inc.; www.msisurfaces.com/quartz-countertops
5) Substitutions: See Section 01 60 00 - Product Requirements.

b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
d. NSF approved for food contact.
e. Finish on Exposed Surfaces: Polished.
f. Color and Pattern: As indicated on drawings.

3. Other Components Thickness: 3/4 inch (19 mm), minimum.
4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch (32 mm) thick; square edge; use marine edge at sinks.
5. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
6. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

## 2.02 MATERIALS

A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

B. Joint Sealant: Mildew-resistant silicone sealant, to match countertop.

## 2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.
2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
2. Height: 4 inches (102 mm), unless otherwise indicated.

C. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

## 3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

### 3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.

B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.

C. Field Joints: 1/8 inch (3 mm) wide, maximum.

### 3.05 CLEANING

A. Clean countertops surfaces thoroughly.

### 3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION 12 36 00**

**SECTION 22 05 00**
**BASIC PLUMBING REQUIREMENTS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

B. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.02 WORK INCLUDED

A. Provide all labor, tools, materials, accessories, parts, transportation, taxes, and related items, essential for installation of the work and necessary to make work, complete, and operational. Provide new equipment and material unless otherwise called for. References to codes, specifications and standards called for in the specification sections and on the drawings mean, the latest edition, amendment and revision of such referenced standard in effect on the date of these contract documents. All materials and equipment shall be installed in accordance with the manufacturer's recommendations.

### 1.03 LICENSING

A. The Contractor shall hold a license to perform the work as issued by the authority having jurisdiction.

B. Plumbing contract work shall be performed by, or under, the direct supervision of a licensed master plumber.

C. Electrical contract work shall be performed by, or under, the direct supervision of a licensed electrician

### 1.04 PERMITS

A. Apply for and obtain all required permits and inspections, pay all fees and charges including all service charges. Provide certificate of approval from the Authorities Having Jurisdiction prior to request for final payment.

B. Provide electrical inspection certificate of approval from Middle Department Inspection Agency, Commonwealth Inspection Agency, or an Engineer approved Inspection Agency prior to request for final payment.

### 1.05 CODE COMPLIANCE

A. Provide work in compliance with the following Codes and Standards based on the current edition in effect at project location:
   1. Building, Code of New York State.
   2. Existing Building Code of New York State.
   3. Fire Code of New York State.
   4. Plumbing Code of New York State.
   5. Mechanical Code of New York State.
   6. Fuel Gas Code of New York State.
   7. Property Maintenance Code of New York State.
   8. Energy Conservation Code of New York State
   9. Accessible and Usable Buildings and Facilities, ICC A117.1.
   10. New York State Department of Labor Rules and Regulations.
   11. New York State Department of Health.
   12. National Electrical Code (NEC).
   13. Occupational Safety and Health Administration (OSHA).
   14. Local Codes and Ordinances.
   15. Life Safety Code, NFPA 101.

## 1.06 GLOSSARY

| | |
|---|---|
| ACI | American Concrete Institute |
| AGA | American Gas Association |
| AGCA | Associated General Contractors of America, Inc. |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AFBMA | Anti-Friction Bearing Manufacturer's Association |
| AMCA | Air Moving and Conditioning Association, Inc. |
| ANSI | American National Standards Institute |
| ARI | Air Conditioning and Refrigeration Institute |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. |
| ASME | American Society of Mechanical Engineers |
| ASPE | American Society of Plumbing Engineers |
| ASTM | American Society for Testing Materials |
| AWSC | American Welding Society Code |
| AWWA | American Water Works Association |
| FM | Factory Mutual Insurance Company |
| IBR | Institute of Boiler & Radiation Manufacturers |
| IEEE | Institute of Electrical and Electronics Engineers |
| IRI | Industrial Risk Insurers |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturer's Association |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NYS/DEC | New York State Department of Environmental Conservation |
| SBI | Steel Boiler Institute |
| SMACNA | Sheet Metal and Air Conditioning Contractors National Association |
| UFPO | Underground Facilities Protective Organization |
| UL | Underwriter's Laboratories, Inc. |
| OSHA | Occupational Safety and Health Administration |
| XL - GAP | XL Global Asset Protection Services |
| | |

## 1.07 DEFINITIONS

| | |
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| Acceptance | Owner acceptance of the project from Contractor upon certification by Owner's Representative. |
| As Specified | Materials, equipment including the execution specified/shown in the contract documents. |
| Basis of Design | Equipment, materials, installation, etc. on which the design is based. (Refer to the article, Equipment Arrangements, and the article, Substitutions.) |
| Code Requirements | Minimum requirements. |
| Concealed | Work installed in pipe and duct shafts, chases or recesses, inside walls, above ceilings, in slabs or below grade. |

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|---|---|
| Coordination Drawings | Show the relationship and integration of different construction elements and trades that require careful coordination during fabrication or installation, to fit in the space provided or to function as intended. |
| Delegated-Design Services | Performance and Design criteria for Contractor provided professional services. Where professional design services or certifications by a design professional are specifically required of a Contractor, by the Contract Documents. Provide products and systems with the specific design criteria indicated.<br><br>If criteria indicated is insufficient to perform services or certification required, submit a written request for additional information to the Engineer.<br><br>Submit wet signed and sealed certification by the licensed design professional for each product and system specifically assigned to the Contractor to be designed or certified by a design professional.<br><br>Examples: structural maintenance ladders, stairs and platforms, pipe anchors, seismic compliant system, wind, structural supports for material equipment, sprinkler hydraulic calculations. |
| Equal, Equivalent, Equal To, Equivalent To, As Directed and As Required | Shall all be interpreted and should be taken to mean "to the satisfaction of the Engineer". |
| Exposed | Work not identified as concealed. |
| Extract | Carefully dismantle and store where directed by Owner's Representative and/or reinstall as indicated on drawings or as described in specifications. |
| Furnish | Purchase and deliver to job site, location as directed by the Owner's Representative. |
| Inspection | Visual observations by Owner's site Representative. |
| Install | Store at job site if required, proper placement within building construction including miscellaneous items needed to affect placement as required and protect during construction. Take responsibility to mount, connect, start-up and make fully functional. |
| Labeled | Refers to classification by a standards agency. |
| Manufacturers | Refer to the article, Equipment Arrangements, and the article, Substitutions. |
| Prime Professional | Architect or Engineer having a contract directly with the Owner for professional services. |
| Product Data | Illustrations, standard schedules, performance charts, instructions, brochures, wiring diagrams, finishes, or other information furnished by the Contractor to illustrate |

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|---|---|
| | materials or equipment for some portion of the work. |
| Provide (Furnish and Install) | Contractor shall furnish all labor, materials, equipment and supplies necessary to install and place in operating condition, unless otherwise specifically stated. |
| Relocate | Disassemble, disconnect, and transport equipment to new locations, then clean, test, and install ready for use. |
| Remove | Dismantle and take away from premises without added cost to Owner, and dispose of in a legal manner. |
| Review and Reviewed | Should be taken to mean to be followed by "for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents". |
| Roughing | Pipe, duct, conduit, equipment layout and installation. |
| Samples | Physical full scale examples which illustrate materials, finishes, coatings, equipment or workmanship, and establishes standards by which work will be judged. |
| Satisfactory | As specified in contract documents. |
| Shop Drawings | Fabrication drawings, diagrams, schedules and other instruments, specifically prepared for the work by the Contractor or a Sub-contractor, manufacturer, supplier or distributor to illustrate some portion of the work. |
| Site Representative | Owner's Inspector or "Clerk of Works" at the work site. |
| Submittals Defined (Technical) | Any item required to be delivered to the Engineer for review as requirement of the Contract Documents.<br><br>The purpose of technical submittals is to demonstrate for those portions of the work for which a submittal is required, the manner in which the Contractor proposes to conform to the information given and design concepts expressed and required by the Contract Documents. |
| | |

**1.08 SHOP DRAWINGS/PRODUCT DATA/SAMPLES**

A. Provide submittals on all items of equipment and materials to be furnished and installed. Submittals shall be accompanied by a transmittal letter, stating name of project and contractor, name of vendor supplying equipment, number of drawings, titles, specification sections (name and number) and other pertinent data called for in individual sections. Submittals shall have individual cover sheets that shall be dated and contain: Name of project; name of prime professional; name of prime contractor; description or names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. Individual piecemeal or incomplete submittals will not be accepted. Similar items, (all types specified) shall be submitted at under one cover sheet per specification section (e.g. lighting fixtures, valves, plumbing fixtures, etc.). Submittals shall include all required

documentation for each product listed in the specification section at the same time as a complete package. Number each submittal by trade. Indicate deviations from contract requirements on Letter of Transmittal. Submittals will be given a general review only. Corrections or comments made on the Submittals during the review do not relieve Contractor from compliance with requirements of the drawings and specifications. The Contractor is responsible for: confirming and correcting all quantities; checking electrical characteristics 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. If submitting hard copies, submit four (4) copies for review.

B. The Engineer will review up to two (2) submissions of any single submittal. The Contractor will be invoiced on an hourly rate basis for the time spent reviewing the same shop drawing in excess of twice.

C. If submittals are to be submitted electronically, all requirements in Item A apply. Submittals shall be emailed in PDF format to specific email address provided by the Construction Manager, General Contractor, Architect or Project Manager. Name of project shall be in subject line of email. Send emails to mealbasubmittalclerk@meengineering.com

D. Refer to Division 01 for additional requirements.

**1.09 EQUIPMENT ARRANGEMENTS**

A. The contract documents are prepared using one manufacturer as the Basis of Design, even though other manufacturers' names are listed. If Contractor elects to use one of the listed manufacturers other than Basis of Design or if the physical size, performance or electrical characteristics for the Basis of Design equipment differs from what is indicated in the contract documents, submit detailed drawings, indicating proposed installation of equipment. Show maintenance clearances, service removal space required, and other pertinent revisions to the design arrangement. Make required changes in the work of other trades, at no increase in any contract. Provide larger motors, feeders, breakers, and equipment, additional control devices, valves, fittings and other miscellaneous equipment required for proper operation, and assume responsibility for proper location of roughing and connections by other trades. Remove and replace doorframes, access doors, walls, ceilings, or floors required to install. If revised arrangement submittal is rejected, revise and resubmit specified Basis of Design item which conforms to Contract Documents.

**1.10 SUBSTITUTIONS**

A. If Contractor desires to bid on any other kind, type, brand, or manufacture of material or equipment than those named in specifications, secure prior approval. To request such approval, Contractor shall submit complete information comparing (item-for-item) material or equipment offered with design material or equipment. Include sufficient information to permit quick and thorough comparison, and include performance curves on same basis, capacities, power requirements, controls, materials, metal gauges, finishes, dimensions, weights, etc., of major parts. If accepted, an addendum will be issued to this effect ahead of bid date. Unless such addendum is issued, substitution offered may not be used.

**1.11 UTILITY COMPANY SERVICES**

A. Division 26 shall make arrangements with local utility company for electric service to the Owner's distribution equipment. Provide underground or overhead electric service as called for and transformers, meter sockets or meter compartments as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the electric service shall comply with the published Utility Company standards. PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.

B. Division 22 shall make arrangements with local utility company for gas service to the Owner's distribution system. Provide service to the building as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the gas service shall comply with the published Utility Company standards. PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.

## 1.12 ROUGHING

A. The Contract Drawings have been prepared in order to convey design intent and are diagrammatic only. Drawings shall not be interpreted to be fully coordinated for construction.

B. Due to small scale of Drawings, it is not possible to indicate all offsets, fittings, changes in elevation, interferences, etc. Make necessary changes in contract work, equipment locations, etc., as part of a contract to accommodate work to avoid obstacles and interferences encountered. Before installing, verify exact location and elevations at work site. DO NOT SCALE plans. If field conditions, details, changes in equipment or shop drawing information require an important rearrangement, report same to Owner's Representative for review. Obtain written approval for all major changes before installing.

C. Install work so that items both existing and new are operable and serviceable. Eliminate interference with removal of coils, motors, filters, belt guards and/or operation of doors. Provide easy, safe, and code mandated clearances at controllers, motor starters, valve access, and other equipment requiring maintenance and operation. Provide new materials, including new piping and insulation for relocated work.

D. Coordinate work with other trades and determine exact route or location of each duct, pipe, conduit, etc., before fabrication and installation. Coordinate with Architectural Drawings. Obtain from Owner's Representative exact location of all equipment in finished areas, such as thermostat, fixture, and switch mounting heights, and equipment mounting heights. Coordinate all work with the architectural reflected ceiling plans and/or existing Architecture. Mechanical and electrical drawings show design arrangement only for diffusers, grilles, registers, air terminals, lighting fixtures, sprinklers, speakers, and other items. Do not rough-in contract work without reflected ceiling location plans.

E. Before roughing for equipment furnished by Owner or in other Divisions, obtain from Owner and other Divisions, approved roughing drawings giving exact location for each piece of equipment. Do not "rough in" services without final layout drawings approved for construction. Cooperate with other trades to insure proper location and size of connections to insure proper functioning of all systems and equipment. For equipment and connections provided in this contract, prepare roughing drawing as follows:
   1. New Equipment: Obtain equipment roughing drawings and dimensions, then prepare roughing-in-drawings. If such information is not available in time, obtain an acknowledgement in writing, then make space arrangements as required with Owner's Representative.

## 1.13 EQUIPMENT AND MATERIAL REQUIREMENTS

A. Provide materials that meet the following minimum requirements:
   1. Materials shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, in accordance with NFPA 255.
   2. All equipment and material for which there is a listing service shall bear a UL label.
   3. Potable water systems and equipment shall be built according to AWWA Standards.
   4. Gas-fired equipment and system shall meet AGA Regulations and shall have AGA label.
   5. All electrical equipment and systems, as a whole, shall be tested and listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL) for the intended use in accordance with the applicable standards and have a physical label indicating such.
   6. Fire protection equipment shall be UL listed and FM approved.

B. Exterior and wet locations shall utilize materials, equipment supports, mounting, etc. suitable for the intended locations. Metals shall be stainless steel, galvanized or with baked enamel finish as a minimum. Finishes and coatings shall be continuous and any surface damaged or cut ends shall be field corrected in accordance with the manufacturer's recommendations. Hardware (screws, bolts, nuts, washers, supports, fasteners, etc.) shall be:
   1. Stainless steel where the associated system or equipment material is stainless steel or aluminum.

2. Hot dipped galvanized or stainless steel where the associated system or equipment is steel, galvanized steel or other.

## 1.14 PAINTING

A. Paint all insulated and bare piping, pipe hangers and supports exposed to view in mechanical equipment rooms, penthouse, boiler rooms and similar spaces. Paint all bare piping, ductwork and supports exposed to the out-of-doors with rust inhibiting coatings. Paint all equipment that is not factory finish painted (i.e. expansion tanks, etc.).

B. All painting shall consist of one (1) prime coat and two (2) finish coats of non-lead oil base paint, unless otherwise indicated herein. Provide galvanized iron primer for all galvanized surfaces. All surfaces must be thoroughly cleaned before painting. Review system color coding prior to painting with the Owner's Representative or Architect.

C. All items installed after finished painting is completed and any damaged factory finish paint on equipment furnished under this contract must be touched up by the Contractor responsible for same.

D. Include painting for patchwork with color to match adjacent surfaces. Where color cannot be adequately matched, paint entire surface. Provide one (1) coat of primer and two (2) finish coats or as called for in the Specifications.

E. All primers and paint used in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

F. Refer to Division 9 - Finishes, for additional information.

## 1.15 CONCEALMENT

A. Conceal all contract work above ceilings and in walls, below slabs, and elsewhere throughout building. If concealment is impossible or impractical, notify Owner's Representative before starting that part of the work and install only after their review. In areas with no ceilings, install only after Owner's Representative reviews and comments on arrangement and appearance.

## 1.16 CHASES

A. New Construction:
   1. Certain chases, recesses, openings, shafts, and wall pockets will be provided as part of General Construction Trade. Mechanical and Electrical trades shall provide all other openings required for their contract work.
   2. Check Architectural and Structural Design and Shop Drawings to verify correct size and location for all openings, recesses and chases in general building construction work.
   3. Assume responsibility for correct and final location and size of such openings.
   4. Rectify improperly sized, improperly located or omitted chases or openings due to faulty or late information or failure to check final location.
   5. Provide 18 gauge galvanized sleeves and inserts. Extend all sleeves 2 inch (50.8 mm). above finished floor. Set sleeves and inserts in place ahead of new construction, securely fastened during concrete pouring. Correct, by drilling, omitted or improperly located sleeves. Assume responsibility for all work and equipment damaged during course of drilling. Firestop all unused sleeves.
   6. Provide angle iron frame where openings are required for contract work, unless provided by General Construction trade.

## 1.17 PENETRATION FIRESTOPPING

A. Refer to Division 07 for project-wide fire stopping information.

## 1.18 NON-RATED WALL PENETRATIONS

A. Each trade shall be responsible for sealing wall penetrations related to their installed work, including but not limited to ductwork, piping, conduits, etc. See individual specification sections for requirements.

## 1.19 SUPPORTS

A. Provide required supports, beams, angles, hangers, rods, bases, braces, and other items to properly support contract work. Modify studs, add studs, add framing, or otherwise reinforce studs in metal stud walls and partitions as required to suit contract work. If necessary, in stud walls, provide special supports from floor to structure above.

B. For precast panels/planks and metal decks, support mechanical/electrical work as determined by manufacturer and the Engineer. Provide heavy gauge steel mounting plates for mounting contract work. Mounting plates shall span two or more studs. Size, gauge, and strength of mounting plates shall be sufficient for equipment size, weight, and desired rigidity.

C. For finished areas without a finished ceiling system such as classrooms, offices, conference rooms, etc., where decking and structure is exposed, and ductwork/piping/conduit is exposed: All mounting brackets, channel support systems and mounting hardware for ductwork, piping, lighting, etc. shall be concealed and approved by the Architect/Engineer prior to the installation. AirCraft cable style hanging for ductwork is required. It is recommended that room mockups be done and receive Architect/Engineer approval prior to proceeding with installation.

D. Equipment, piping, conduit, raceway, etc. supports shall be installed to minimize the generation and transmission of vibration.

E. Materials and equipment shall be solely supported by the building structure and connected framing. Gypboard, ceilings, other finishes, etc. shall not be used for support of materials and equipment.

## 1.20 ACCESS PANELS

A. Provide access panels for required access to respective trade's work. Location and size shall be the responsibility of each trade. Access panels provided for equipment shall provide an opening not smaller than 22 inch (558.8 mm). by 22 in. Panels shall be capable of opening a minimum of 90 degrees. Bear cost of construction changes necessary due to improper information or failure to provide proper information in ample time. Access panels over 324 square inches shall have two cam locks. Provide proper frame and door type for various wall or ceiling finishes. Access panels shall be equal to "Milcor" as manufactured by Inland Steel Products Co., Milwaukee, Wisconsin. Provide General Construction trade with a set of architectural plans with size and locations of access panels.

## 1.21 CONCRETE BASES

A. Provide concrete bases for all floor mounted equipment. Provide 3,000 lb. concrete, chamfer edges, trowel finish, and securely bond to floor by roughening slab and coating with cement grout. Bases 4 inch (101.6 mm). high (unless otherwise indicated); shape and size to accommodate equipment. Provide anchor bolts in equipment bases for all equipment provided for the project, whether mounted on new concrete bases or existing concrete bases.

## 1.22 HVAC EQUIPMENT CONNECTIONS

A. Contractor is responsible for draining, filling, venting, chemically treating and restarting any systems which are affected by work shown on the Contract Documents unless specifically noted otherwise.

B. Provide final condensate, hot water, glycol, chilled and condenser water, drain connections to all equipment as required by the equipment. Provide final connections, including domestic water piping, wiring, controls, and devices from equipment to outlets left by other trades. Provide equipment waste, drip, overflow and drain connections extended to floor drains.

C. Provide for Owner furnished and Contractor furnished equipment all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, insulation, sheet metal work, controls, dampers, as required.

## 1.23 PLUMBING EQUIPMENT CONNECTIONS

A. Contractor is responsible for draining, filling, venting, chemically treating and restarting any systems which are affected by work shown on the Contract Documents unless specifically

noted otherwise.

B. Provide roughing and final water, waste, vent, gas, air connections to all equipment. Provide loose key stops, sanitary "P" traps, tailpiece, adapters, gas or air cocks, and all necessary piping and fittings from roughing point to equipment. Provide installation of sinks, faucets, traps, tailpiece furnished by others. Provide cold water line with gate valve and backflow prevention device at locations called for. Provide continuation of piping and connection to equipment that is furnished by others. Provide relief valve discharge piping from equipment relief valves.

C. Provide valved water outlet adjacent to equipment requiring same. Provide equipment type floor drains, or drain hubs, adjacent to equipment.

D. Install controls and devices furnished by others.

E. Refer to Contract Documents for roughing schedules, and equipment and lists indicating scope of connections required.

F. Provide for Owner furnished and Contractor furnished equipment all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, as required.

**1.24 ELECTRICAL EQUIPMENT CONNECTIONS**

A. Provide complete power connections to all electrical equipment. Provide control connections to equipment. Heavy duty NEC rated disconnect ahead of each piece of equipment. Ground all equipment in accordance with NEC.

B. Provide for Owner furnished and Contractor furnished equipment all power wiring, electric equipment, control wiring, switches, lights, receptacles, and connections as required.

**1.25 STORAGE AND PROTECTION OF MATERIALS AND EQUIPMENT**

A. Store Materials on dry base, at least 6 inch (152.4 mm). aboveground or floor. Store so as not to interfere with other work or obstruct access to buildings or facilities. Provide waterproof/windproof covering. Remove and provide special storage for items subject to moisture damage. Protect against theft or damage from any cause. Replace items stolen or damaged, at no cost to Owner.

B. Refer to Division 01 for additional information.

**1.26 FREEZING AND WATER DAMAGE**

A. Take all necessary precautions with equipment, systems and building to prevent damage due to freezing and/or water damage. Repair or replace, at no change in contract, any such damage to equipment, systems, and building. Perform first seasons winterizing in presence of Owner's operating staff.

**1.27 OWNER INSTRUCTIONS**

A. Before final acceptance of the work, furnish necessary skilled labor to operate all systems by seasons. Instruct designated person on proper operation, and care of systems/equipment. Repeat instructions, if necessary. Obtain written acknowledgement from person instructed prior to final payment. Contractor is fully responsible for system until final acceptance, even though operated by Owner's personnel, unless otherwise agreed in writing. List under clear plastic, operating, maintenance, and starting precautions procedures to be followed by Owner for operating systems and equipment.

**1.28 OPERATION AND MAINTENANCE MANUALS**

A. Submit by email (preferred) or digital media, thru the normal project submittal process. Include a copy of each final approved Shop Drawing, wiring diagrams, piping diagrams, spare parts lists, final testing and balancing report, as-built drawings and manufacturer's instructions. Include typewritten instructions, describing equipment, starting/operating procedures, emergency operating instructions, summer-winter changeover, freeze protection, precautions and recommended maintenance procedures. Include name, address, and telephone number of installing contractor and of supplier manufacturer Representative and service agency for all

major equipment items. Provide a table of contents page and dividers based upon specification section numbers. Submit in a compiled and bookmarked PDF format as outlined below. Each item listed in the table of contents shall include a hyperlink to the associated section of the O&M Manual, in addition to the bookmarking.

B. Provide content for Operation and Maintenance Manuals as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Engineer will comment on whether content of operation and maintenance submittals is acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

C. Submit Operation and Maintenance Manuals in the following format:
   1. Submit by uploading to web-based project software site, or by email to Architect, as a formal project submittal in conformance with the project specific submittal procedures. Enable reviewer comments on draft submittals.
   2. 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.
   3. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in the 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.

D. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing Owner training. Engineer will comment on whether general scope and content of manual are acceptable.

E. Final Manual Submittal: Submit O&M manual in final form prior to requesting inspection for Substantial Completion and at least 2 weeks before commencing Owner training. Engineer will return copy with review comments.
   1. Correct or revise O&M manual to comply with Engineer's comments. Submit copies of each corrected manual within 2 weeks of receipt of Engineer's comments.

F. Refer to Division 01 for additional requirements.

**1.29 RECORD DRAWINGS**

A. The Contractor shall obtain at his expense one (1) set of construction Contract Drawings, (including non-reproduction black and white prints or electronic files) for the purpose of recording as-built conditions.

B. The Contractor shall perform all survey work required for the location and construction of the work and to record information necessary for completion of the record drawings. Record drawings shall show the actual location of the constructed facilities in the same manner as was shown on the bid drawings. All elevations and dimensions shown on the drawings shall be verified or corrected so as to provide a complete and accurate record of the facilities as constructed.

C. It shall be the responsibility of the Contractor to mark EACH sheet of the contract documents in red and to record thereon in a legible manner, any and all approved field changes and conditions as they occur. A complete file of approved field sketches, diagrams, and other changes shall also be maintained. At completion of the work, the complete set of red marked contract documents, plus all approved field sketches and diagrams shall be submitted to the engineer and used in preparation of the record drawings.

D. A complete set of red marked contract drawings shall be submitted, at one time, as the "Record" set. If there are no changes to a specific drawing, the contractor shall indicate "NO CHANGES" on that drawing. ALL drawings shall be included in the "Record" set.

E. The complete set of red marked Contract Documents or electronic files shall be certified by the Contractor as reflecting record conditions and submitted to the engineer for review.

F. The Contractor shall have the marked up set scanned, if they are not already electronic files, and then submit them to the Engineer as the "Record Set".

G. Refer to Division 01 for additional requirements.

**1.30 FINAL INSPECTION**

A. Upon completion of all Engineering Site Observation list items, the Contractor shall provide a copy of the Engineering Site Observation Report back to the Engineer with each items noted as completed or the current status of the item.

**1.31 COMMISSIONING**

A. Refer to General Commissioning Requirements in Division 01 for additional requirements.

**1.32 TEMPORARY HEATING AND COOLING**

A. Refer to the General Conditions of the Contract for Construction and Supplemental General Conditions.

**1.33 TEMPORARY FACILITIES**

A. Refer to the Division 01 Sections, General Conditions and Supplemental General Conditions.

**1.34 TEMPORARY LIGHT AND POWER**

A. Refer to the Division 01 Sections, General Conditions and Supplemental General Conditions.

**1.35 CLEANING**

A. It is the Contractor's responsibility to keep clean all equipment and fixtures provided under this contract for the duration of the project. Each trade shall keep the premises free from an accumulation of waste material or rubbish caused by his operations. The facilities require an environment of extreme cleanliness, and it is the Contractor's responsibility to adhere to the strict regulations regarding procedures on the existing premises. After all tests are made and installations completed satisfactorily:
   1. Thoroughly clean entire installation, both exposed surfaces and interiors.
   2. Remove all debris caused by work.
   3. Remove tools, surplus, materials, when work is finally accepted.

**1.36 TRANSFER OF ELECTRONIC FILES**

A. M/E Engineering, P.C. will provide electronic files for the Contractor's use in the preparation of sheet metal shop drawings, coordination drawings, or record drawings related to the project, subject to the following terms and conditions:
   1. The Contractor shall submit a formal request for electronic drawing files on the M/E Engineering, P.C. website, by utilizing the following website link: http://www.meengineering.com/contact-pages/contractor-request
   2. M/E Engineering, P.C. makes no representation as to the compatibility of these files with the Contractor's hardware or the Contractor's software beyond the specific release of the referenced specifications.
   3. M/E Engineering can only provide CAD files of M/E/P/FP drawing levels for which we are the Engineer of Record. CAD files of Architectural backgrounds, reflected ceiling plans, structural plans, etc. must be obtained separately from the Architect of Record.
   4. Data contained on these electronic files is part of M/E Engineering, P.C.'s instruments of service shall not be used by the Contractor or anyone else receiving data through or from the Contractor for any purpose other than as convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by the Contractor or by others will be at the Contractor's sole risk and without liability or legal exposure to M/E Engineering, P.C. The Contractor agrees to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against M/E Engineering, P.C., its officers, directors, employees, agents or sub-consultants which may

arise out of or in connection with the Contractor's use of the electronic files.

5. Furthermore, the Contractor shall, to the fullest extent permitted by law, indemnify and hold harmless, M/E Engineering, P.C. from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from the Contractor's use of these electronic files.
6. These electronic files are not contract documents. Significant difference may arise between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. M/E Engineering, P.C. makes no representation regarding the accuracy or completeness of the electronic files the Contractor receives. In the event that a conflict arises between the signed contract documents prepared by M/E Engineering, P.C. and electronic files, the signed contract documents shall govern. The Contractor is responsible for determining if any conflicts exist. By the Contractor's use of these electronic files the Contractor is not relieved of the Contractor's duty to comply with the contract documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, field verify conditions and coordinate the Contractor's work with that of other contractors for the project.

**END OF SECTION 22 05 00**

**SECTION 22 05 23**
**VALVES**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Document.

### 1.02 SUBMITTALS

A. Submit manufacturer's data in accordance with Basic Mechanical and Electrical Requirements. Obtain approval prior to ordering material.

B. Provide submittals for all items specified under Part 2 of this section.

## PART 2 - PRODUCTS

### 2.01 VALVES - GENERAL

A. Valves shall have following requirements:
   1. Working pressure stamped or cast on bodies.
   2. Stem packing serviceable without removing valve from line.
   3. All items here-in used to convey water for potable use shall be lead free in accordance with NSF Standard, Standard 61, Section 9 - Standard for Drinking Water and Lavatory Faucets and NSF Standard 372 - Maximum Lead Requirements. Compliance shall be via third party testing and certification.

B. Acceptable Manufacturers:
   1. Thermostatic Balance Valves: Caleffi, Bell & Gossett, ThermOmegaTech
   2. Ball Valves: Apollo, Hammond, Milwaukee, Nibco, Red White, Watts.
   3. Check Valves: Hammond, Milwaukee, Nibco, Red White, Stockham, Watts.
   4. To establish a standard of quality and identify features, certain manufacturer's numbers are given in the following paragraphs.

### 2.02 DOMESTIC WATER VALVES

A. Check Valves:
   1. 2 in. and Smaller: Lead-free swing check with silicone bronze body, bonnet and trim, PTFE disc seat and stainless steel seat disc washer, 200 psi working pressure, Nibco T-413-Y-LF (threaded) or Nibco's S-413-Y-LF (solder).

B. Ball Valves:
   1. 2 in. and Smaller: American-made, lead-free, bronze 2-piece body, chrome-plated lead-free brass ball, lead-free brass stem, full port, teflon seats and stem packing, separate packing and handle nut, blow out proof stem extended for insulation, vinyl insulator for handle, 600 WOG, 150 SWP: Watts #LFB-6080G2 (threaded ends) or Watts #LFB-6081G2 (sweat ends).

C. Thermostatic Balance Valves:
   1. 2 in. and Smaller: Lead-free, DZR low-lead brass body, threaded or solder ends, rated for 230 psi; ABS temperature adjustment dial, range of 95F - 140F, include optional check valve, and pre-formed insulation to permit access for balancing and readout; Caleffi 1161 Series.
   2. 2 in. and Smaller: stainless steel, rated for 200 PSIG working pressure and 250°F max. temperature, have a fixed, non-adjustable (tamper proof) temperature setpoint; temperature setpoints range from 80°F to 170°F in 5°F increments. The valve shall have a temperature accuracy of ±3.0°F, and shall have a wax thermostatic element. ThermOmegaTech CircutSolver Series.

D. Valves for Gauges and Instruments:
   1. 1/2 in. Size: Brass bar stock for 1000 psi and 300°F; Trerice No. 735 needle valve.

E. Hose Thread Drain Valves:

1. Ball valve, bronze body, hardened chrome ball with hose thread end, cap and chain; Watts #LFFBV/FBVS-3C-CC.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Provide all shutoff, check, balancing and other type valves as indicated, as required by Code and as required for proper system maintenance, isolation and safety. Provide at major building and systems sections. Provide shutoff valves on all branch lines serving two fixtures or more, at all equipment, fixtures, before and after automatic control valves, and at future connections.

B. Locate valves for easy access and provide separate support where necessary. Install valves with stems at or above the horizontal position. Install swing check valves in horizontal position with hinge pin level.

C. Provide drain valves with hose thread connections on all equipment. Provide hose thread drain valves at all low points to enable complete drainage of all piping systems including, water mains, branches, at base of vertical risers and at strainers.

D. Inspect valves for proper operation before installation. Install underground valve boxes vertically over each valve. Adjust top of box to proper grade. Immediately backfill with crushed stone and carefully tamp into place. Unless otherwise noted, leave in the open position.

### 3.02 DOMESTIC WATER SYSTEM

A. Install balance valves in each hot water circulation branch and where noted.

**END OF SECTION 22 05 23**

**SECTION 22 05 53**
**PLUMBING IDENTIFICATION**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services as required for the complete installation designed in Contract Documents.

### 1.02 QUALIFICATIONS

A. All identification devices shall comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles.

### 1.03 SUBMITTALS

A. Submit manufacturer's technical product data and installation instructions for each identification material and device. Submit valve schedule for each piping system typewritten on an 8-1/2 in. x 11 in. paper (minimum), indicating valve number, location and valve function. Submit schedule of pipe, equipment and name identification for review before stenciling or labeling.

### 1.04 MAKES

A. Allen Systems, Inc., Brady (W.H.) Co.; Signmark Div., Industrial Safety Supply Co., Inc., Seton Name Plate Corp.

## PART 2 - PRODUCTS

### 2.01 GENERAL

A. Provide manufacturer's standard products of categories and types required for each application. In cases where there is more than one type specified for an application, selection is installer's option, but provide single selection for each product category.

B. All adhesives used for labels in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits as called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

### 2.02 PIPING IDENTIFICATION

A. Identification Types:
   1. Pressure Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color coded, pressure sensitive vinyl pipe markers complying with ANSI A13.1. Provide a 360° wrap of flow arrow tape at each end of pipe label.

B. Lettering:
   1. Piping labeling shall conform to the following list:

| PIPE FUNCTION | IDENTIFICATION |
|---|---|
| Cold Water | DOMESTIC COLD WATER |
| Hot Water | DOMESTIC HOT WATER |
| Hot Water Recirculating | DOMESTIC HOT WATER RECIRCULATING |
| Sanitary Waste | SANITARY WASTE |
| Storm | STORM |
| Vent | VENT |
| Pump Discharge | PUMP DISCHARGE |

### 2.03 VALVE IDENTIFICATION

A. Valve Tags:
   1. Standard brass valve tags, 2 in. diameter with 1/2 in. high black-filled numerals. Attach to valve with brass jack chain and "S" hook. Identify between heating and plumbing services with 1/4 in. letters above the valve number.

2. Acceptable Manufacturers: Seton Style No. M4507, or approved equal.

B. Valve Chart:
   1. Provide valve chart for all valves provided as a part of this project. Frame and place under clear glass. Mount in Mechanical Room.

**2.04 ABOVE CEILING EQUIPMENT LOCATOR**

A. 3/4 in. diameter adhesive stickers placed on ceiling grid and color-coded.

B. The color for all plumbing valves shall be BLUE.

**PART 3 - EXECUTION**

**3.01 GENERAL**

A. Provide valve tags for all valves provided on project.

B. Provide equipment tags for all equipment provided on project.

C. Provide piping identification with directional flow arrows for all piping on project, maximum intervals of 20'-0". For piping installed through rooms, provide at least one (1) pipe label in each room, for each pipe function.

**END OF SECTION 22 05 53**

## SECTION 22 05 80
## EXCAVATION AND BACKFILL

### PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

### 1.02 WORK INCLUDED

A. Provide labor, materials, equipment, and services to perform operations required for the complete installation and related work as required in the Contract Documents.

### 1.03 SUBMITTALS

A. Not required.

### 1.04 CODES

A. Comply with local, state, and federal codes, regulations, and laws affecting work of this section.

### PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Cushion Sand: Clean, coarse, and free of organic matter, conforming to New York State DOT Item No. 703.06.

B. Crushed Stone: Crushed stone, graded, free of organic materials, No. 1 to No. 4 size. Conforming to New York State DOT Item No. 703-0201.

C. Gravel Fill: Well-graded natural inorganic sand and gravel conforming to New York State DOT Item No. 703-0202.

D. Ordinary Fill: Well-graded, natural soil, meeting the following requirements:
   1. Free of organic and other compressible materials, debris and frozen materials, and of stones larger than 4 in. maximum dimension.
   2. Be of such nature and character that it can be compacted to the specified densities.
   3. Free of highly plastic clays, of materials subject to decay, decomposition, or dissolution, and of cinders, ash and other corrosive materials.
   4. Maximum dry density of not less than 115 lbs. per cu. ft.
   5. Material from excavation on the site may be used as ordinary fill if it meets the above requirements.

### PART 3 - EXECUTION

### 3.01 PREPARATORY WORK, SCHEDULING SHUTDOWNS, AND TEMPORARY WORK

A. Build lines to grade and elevations shown. Provide stakes, grade boards, cleats, nails, and instruments. Locate and stake each new run for its entire length. Verify elevations given. Start excavation at low point. Notify Engineer of elevation discrepancies. Protect marks and stations. Before starting excavation work, coordinate with and furnish schedule of work to Owner's Representative and other trades. Provide and maintain temporary walks and bridges over excavations where underground utility lines, sewers, water lines, etc., cross access roads, walks, and streets. Make necessary arrangement with authorities having jurisdiction.

### 3.02 PROTECTION

A. Provide bracing, shoring, sheathing and other work for protection of personnel, the contract work, excavations, trees, shrubs, existing structures, and surrounding properties. Provide and maintain barricades, warning signs, flags, and lights for the protection of work, workmen, public, and property. Plank walks, pavements, and curbs to be crossed by equipment. Protect adjacent property, fences, trees, shrubs, roads, curbs, sidewalks, manholes, hydrants, and other items.
   1. Restore, repair or replace any items damaged or destroyed to a condition equal to that existing before such damage occurred.

B. The use of equipment with metal tracks over paved areas is not permitted unless the pavement is protected with methods as approved by the Owner's Representative.

C. Saw cut floor slabs perpendicular to surface and parallel with/perpendicular to walls. Replace slabs and adjacent surfaces damaged by excavation operations with materials equal to adjacent existing materials.

**3.03 CUTTING AND PATCHING**

A. Prior to starting work, obtain necessary permits and pay all costs and fees. Cut paved areas, perpendicular to surface and in straight saw-cut lines. Replace pavements, roadways, streets, blacktop areas and walks damaged by excavating operations with materials equal to adjacent pavements.

**3.04 EXCAVATION**

A. Provide for buried work in contract both inside and outside of building. Excavate to proper depth and width for installation work and comply with rules set forth by New York State Department of Labor. Remove materials including masonry work, rubble, earth, brickwork, concrete, sand, debris, abandoned pipe lines, drains, sewers, rocks, boulders, and concrete, all of which is considered "earth excavation". Provide for legal disposition of excess excavated materials. Make allowance for gravel fill, sand bases, form work, floor slabs, manholes, anchor and thrust blocks, sheet piling, drainage pumps, and work space. Start excavation at rough grade and provide form work and sheet piling where required.

B. Trench Excavation:
   1. By open cut, to proper depth and grade no wider than required for placement of work and not more than 100 ft. in advance of utility being installed.
   2. Should trench bottom be wet, unstable or otherwise incapable of supporting the contract work, immediately report the condition to the Owner's Representative. Should it be deemed unsuitable, excavate to depth as directed and backfill with gravel to trench depth, or provide concrete cradling.
   3. Should rock be encountered, excavate 6 in. deeper and fill space between trench bottom and pipe with coarse sand, well compacted to form a firm pipe bed.

C. Shoring, Bracing, Sheathing:
   1. In addition to governing codes, protect sides of excavations with shoring, bracing and sheathing to prevent sliding or caving of banks and to protect adjacent structures. Remove as backfill is placed.
   2. Provide at locations adjacent to existing manholes, hydrants, and similar items.

D. General Excavation:
   1. As required for all buried work. This shall include, but not be limited to, piping, tanks, ductbanks, conduits, footings, manholes, anchors, concrete pads, thrust blocks, fixture bases, and other work in contract.

**3.05 BACKFILL**

A. Bedding:
   1. Around piping with cushion sand from 6 in. below to 8 in. above. Apply by hand and compact under and at sides by mechanical means.
   2. Piping, jackets and sand bed must be inspected and tested prior to backfill of any nature. Provide necessary anchors, thrust blocks, for testing.

B. Remainder of Trench:
   1. Backfill remainder of trench in 12 in. layers, with ordinary fill materials, except as otherwise specified. Do not use frozen material. Remove boulders, stones, broken rock, wood, bricks, blocks, and debris from fill materials before backfill operation.

C. Compaction Requirements:
   1. Compaction to not less than 95% density compared to maximum laboratory tests by weight, per modified ASTM D1557-64T, latest editions, Method "A" under slab on grade,

roadways, drives, and other paved areas and 85% for general grading.

### 3.06 REMOVAL OF WATER

A. Provide pumps, hoses, pipe, labor and fuel, necessary to keep excavations free of water accumulation. Maintain and operate equipment. Discharge water in manner not to interfere with any trade's work, undermine or disturb adjacent structures or properties. Grade to prevent surface water from flowing into all excavations and trenches. Do not discharge dirt, backfill or debris into sanitary or storm drainage systems.

### 3.07 FLOOR SLABS

A. Upon completion of backfilling, drill and grout steel dowels into existing slab, place steel rebar and pour concrete slab the same thickness as the existing slab. All work shall be performed by workmen skilled in the appropriate trade in accordance with the requirements of the Architect.

B. New slab shall be finished smooth and flush with existing slab.

### 3.08 RESTORATION

A. On completion of the work, clean the entire site, remove surplus earth, large stones and debris and legally dispose to an off-site location. Remove tools and equipment and leave the entire area in a neat condition.

**END OF SECTION 22 05 80**

**SECTION 22 07 00**
**INSULATION**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 SUBMITTAL

A. Shall include product description, manufacturer's installation instructions, types and recommended thicknesses for each application, and location of materials.

## PART 2 - PRODUCTS

### 2.01 GENERAL

A. Insulation, jackets, adhesive, and coatings shall comply with the following:
   1. Treatment of jackets or facing for flame and smoke safety must be permanent. Water-soluble treatments not permitted.
   2. Insulation, including jackets, finishes and adhesives on the exterior surfaces of pipes and equipment, shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less.
   3. Asbestos or asbestos bearing materials are prohibited.
   4. 2020 Energy Conservation Code of New York State
   5. All adhesives and sealants used for insulation in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits as called for in the current version of U.S. Green Building Council LEED Credits EQ E4.1 and EQ E4.2.
   6. Provide materials which are the standard products of manufacturers regularly engaged in the manufacture of such products and that essentially duplicate items that have been in satisfactory use for at least two (2) years prior to bid opening. Provide insulation systems in accordance with the approved MICA or NAIMA Insulation Standards.
   7. Insulation shall be clearly marked with manufacturer's name, identification of installed thermal resistance (R) value, out-of-package R value, flame spread and smoke developed indexes in accordance with Energy Code requirements.

### 2.02 REFERENCE STANDARDS

A. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2020.

B. ASTM F1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor; 2020.

### 2.03 ACCEPTABLE MANUFACTURERS

A. Fiberglass: Knauf, Johns Manville, Owen-Corning, Certainteed

### 2.04 PIPE INSULATION (RIGID FIBERGLASS TYPE)

A. Product meeting ASTM C 547, ASTM C 585, and ASTM C 795; rigid, molded, noncombustible.

B. 'K' Value: ASTM C 335, 0.23 at 75°F mean temperature. Maximum Service Temperature: 1000°F.

C. Vapor Retarder Jacket: ASJ/SSL conforming to ASTM C 1136 Type I, secured with self-sealing longitudinal laps and butt strips.

D. Field-Applied PVC Fitting Covers with Flexible Fiberglass Insulation: Proto Corporation 25/50 or Indoor/Outdoor, UV-resistant fittings, jacketing and accessories, white or colored. Fitting cover system shall consist of pre-molded, high-impact PVC materials with blanket type fiberglass wrap inserts. Blanket fiberglass wrap inserts shall have a thermal conductivity ('K') of 0.26 at 75°F mean temperature. Closures shall be stainless steel tacks, matching PVC tape, or PVC adhesive per manufacturer's recommendations.

## 2.05 FIRE RATED INSULATION

A. Wrap shall be fully tested against external fires (ASTM E 119/UL263), through penetration insulated piping fires (ASTM 814/UL1479), wall fires (ASTM E 119), and surface burning (ASTM E 84/UL723). Wrap for engine exhaust applications shall use two layers of 1-1/2 in. wrap. The interior layer shall be applied with a butt joint. The second layer shall be offset a minimum of six inches from the initial layer, with an overlap of three inches and the insulated pipe is banded with stainless steel straps.

B. Acceptable Manufacturers: John Mansville Firetemp Wrap, Certainteed FlameChek or approved equal.

## 2.06 FIELD-APPLIED JACKETS

A. Piping:

1. PVC Pipe Jacket: High-impact, ultraviolet-resistant PVC; 20 mils thick; 25 or less flame spread rating/50 or less smoke developed rating, roll stock ready for shop or field cutting and forming. Adhesive: As recommended by insulation material manufacturer. PVC Jacket Color: White.

## 2.07 COATINGS, MASTICS, ADHESIVES AND SEALANTS

A. Vapor Barrier Coatings: Used in conjunction with reinforcing mesh to coat insulation on below ambient services temperatures. Permeance shall be no greater than 0.08 perms at 45 mils dry as tested by ASTM F1249. Foster 30-65 Vapor Fas; Childers CP-34, or approved equal.

B. Lagging Adhesives: Used in conjunction with canvas or glass lagging cloth to protect equipment/piping indoors. Foster 30-36 Sealfas; Childers CP-50AMV1 Chil Seal, or approved equal.

C. Weather Barrier Mastic: Used outdoors to protect above ambient insulation from weather. Foster 46-50 Weatherite; Childers CP-10 Vi Cryl, or approved equal.

D. Fiberglass Adhesive: Used bond low density fibrous insulation to metal surfaces. Shall meet ASTM C916 Type II. Foster 85-60; Childers CP-127, or approved equal.

## 2.08 PIPE SUPPORT INSULATION INSERTS

A. 20 lbs./cu. ft. molded fiberglass, for -120°F to +450°F service temperature, non-combustible, 0.30 thermal conductivity (k), same thickness as pipe insulation.

B. Acceptable Manufacturers: Hamfab "H" Block, or approved equal.

## 2.09 MATERIALS AND SCHEDULES

A. See Exhibits at the end of this section.

# PART 3 - EXECUTION

## 3.01 GENERAL REQUIREMENTS

A. All materials shall be installed by skilled labor regularly engaged in this type of work. All materials shall be installed in strict accordance with manufacturer's recommendations, building codes, and industry standards.

B. Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such a manner as to protect all raw edges, ends and surfaces of insulation. No glass fibers shall be exposed to the air.

C. All pipe insulation shall be continuous through hangers, sleeves, walls, ceiling, floor, or roof openings, unless not allowed by fire stop system. Refer to Sections 220500, "Basic Plumbing Requirements" and 221010, "Piping Systems and Accessories" for firestop systems.

D. Provide thermal insulation on clean, dry surfaces and after piping and equipment (as applicable) have been tested. Do not cover pipe joints with insulation until required tests are completed.

E. All cold surfaces that may "sweat" must be insulated. Vapor barrier must be maintained; insulation shall be applied with a continuous, unbroken moisture and vapor seal. All hangers,

supports, anchors, or other projections that are secured to cold surfaces shall be insulated and vapor sealed to prevent condensation. Cover valves, fittings and similar items in each piping system with insulation as applied to adjoining pipe run. Extra care must be taken on piping appurtenances to insure a tight fit to the piping system. For piping systems with fluid temperatures below ambient, all vapor retarder jacket (ASJ) seams must be coated with vapor barrier coating. All associated elbows, fittings, valves, etc. must be coated with vapor barrier coating and reinforcing mesh to prevent moisture ingress. Valve extension stems require Elastomeric insulation that is tight fitting to the adjoining fiberglass system insulation. Pumps, strainers, drain valves, etc. must be totally encapsulated with Elastomeric insulation.

F. Items such as manholes, handholds, clean-outs, plugged connections, pet cocks, air vents, ASME stamp, and manufacturers' nameplates, may be left un-insulated unless omitting insulation would cause a condensation problem. When such is the case, appropriate tagging shall be provided to identify the presence of these items. Provide neatly beveled edges at interruptions of insulation.

G. Provide protective insulation as required to prevent personal injury.

H. All pipes shall be individually insulated.

I. If any insulation material becomes wet because of transit or job site exposure to moisture or water, the contractor shall not install such material, and shall remove it from the job site.

J. All exposed surfaces shall be white, unless noted otherwise.

**3.02 PIPE INSULATION**

A. Insulate piping systems including fittings, valves, flanges, unions, strainers, and other attachments installed in piping system, whether exposed or concealed .

B. Insulation installed on piping operating below ambient temperatures must have a continuous vapor retarder. All joints, seams and fittings must be sealed. Insulation shall be continuous through hangers on all water piping and storm water piping.

C. Hanger Shields: Refer to Section 221010 "Piping Systems and Accessories".

D. Hanger shields shall be installed between hangers or supports and the piping insulation. Rigid insulation inserts shall be installed as required between the pipe and the insulation shields. Inserts shall be of equal thickness to the adjacent insulation and shall be vapor sealed as required.
   1. Pre-Insulated Type: Butt insulation to hanger shields and apply a wet coat of vapor barrier cement to the joints and seal with 3 in. wide vapor barrier tape.
   2. Field Insulated Type: Provide Hamfab Co. "H" blocks per manufacturers recommended spacing between pipe and shield.
   3. Tape shields to insulation.

E. Joints in section pipe covering made as follows:
   1. All ends must be firmly butted and secured with appropriate butt-strip material. On high-temperature piping, double layering with staggered joints may be appropriate. When double layering, the inner layer should not be jacketed.
   2. Standard: Longitudinal laps and butt joint sealing strips cemented with white vapor barrier coating, or factory supplied pressure sensitive adhesive lap seal.
   3. Vapor Barrier: For cold services, Longitudinal laps and 4 in. vapor barrier strip at butt joints shall be sealed with white vapor barrier coating. Seal ends of pipe insulation at valves, flanges, and fittings with white vapor barrier coating.

F. Fittings, Valves and Flanges:
   1. Domestic Hot and Cold Water: Premolded fitting insulation of the same material and thickness as the adjacent pipe insulation.
   2. White PVC jacketing, with continuous solvent weld of all seams. Tape all fittings.

G. Apply PVC jacket where indicated, with 1 in. overlap at longitudinal seams and end joints. Seal with manufacturers recommended adhesive.

H. Piping in exterior walls, spaces, overhangs, attics, or where subject to freezing: Insulate pipe with double the thickness called for. Piping in wall chases: In addition to the above, pack chase with loose glass fiber insulation.

I. Provide insulation on exposed hot and cold plumbing piping to within 18 in. of fixture or equipment connection.

J. Insulate exposed domestic water and waste piping for plumbing fixtures designated for use by the handicapped.

**3.03 EXHIBIT "I" - PIPE INSULATION MATERIALS**

| SERVICE | INSULATION MATERIAL | THICKNESS | REMARKS |
|---|---|---|---|
| Domestic cold water | Glass fiber | 1-1/2 in. and larger: 1 in.<br>1-1/4 in. and smaller: 1 in. | |
| Domestic hot, tempered and circulation water (105°F - 140°F) | Glass fiber | 1-1/2 in. and larger: 1-1/2 in.<br>1-1/4 in. and smaller: 1 in. | |
| AC unit drains, overflows and indirect waste piping associated with any HVAC equipment | Glass fiber | All sizes: 1/2 in. | Not required for exposed PVC drains |
| Storm and secondary storm water | Glass fiber | All sizes: 1 in. | Insulate body of drain and storm water piping, horizontal and vertical, down to connection below ground floor slab or in crawl space |
| Sanitary and waste | Glass fiber | All sizes: 1/2 in. | |

**END OF SECTION 22 07 00**

## SECTION 22 10 10
## PIPING SYSTEMS AND ACCESSORIES

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 SUBMITTALS

A. Provide a schedule of pipe materials, fittings and connections.

B. Provide a detailed matrix listing the specific UL approved firestop system assembly to be used for each type of piping provided and each type of construction to be penetrated along with all associated UL assembly details.

### PART 2 - PRODUCTS

### 2.01 GENERAL

A. Pipe and fittings shall be new, marked with manufacturer's name and comply with applicable ASTM and ANSI Standards.

B. All items here-in used to convey water for potable use shall be lead free in accordance with NSF, Standard 61, Section 9 - Standard for Drinking Water and Lavatory Faucets and NSF Standard 372 - Maximum Lead Requirements. Compliance shall be via third party testing and certification.

C. All adhesives, sealers and primers used for piping in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits called for in the current version of U.S. Green Building Council LEED Credits EQ4.1 and EQ4.2.

### 2.02 REFERENCE STANDARDS

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.

B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.

C. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2018.

D. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2021.

E. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.

F. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV); 2020.

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; 2023.

I. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.

J. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2020.

K. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

L. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.

M. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2020.

N. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

## 2.03 STEEL PIPING AND FITTINGS

A. Pipe: ASTM A53, or ASTM A106 seamless, Schedule 40 weight; black finish as called for; ends chamfered for welding or grooved for grooved mechanical connections.

B. Fittings: Same material and pressure class as adjoining pipe.
   1. Threaded fittings: Cast or malleable iron, black or galvanized, as called for; drainage type where called for; UL listed and FM approved for fire protection systems. Street type 45° and 90° elbows are not acceptable.

C. Flanges, Unions, and Couplings:
   1. Threaded Connections:
      a. Unions: Malleable iron, bronze to iron seat, 300 lb. wwp; for sizes 2 in. and smaller.
      b. Couplings: Malleable iron. Steel thread protectors are not acceptable as couplings.

D. Gauge and Instrument Connections: Nipples and plugs for adapting gauges and instruments to piping system shall be IPS brass.

## 2.04 COPPER TUBE AND FITTINGS

A. Pipe: ASTM B88; Type K or L, hard temper. Soft temper only as called for. Plans show copper tube sizes.

B. Fittings: Wrought copper and copper alloy, ASME B16.22 or cast copper alloy, ASME B16.18; solder end connections.

C. Joints: Comply with the requirements of ASTM B828.

D. Unions and Flanges: 2 in. and smaller use unions, solder type, cast bronze, ground joint, 150 lb. swp: 2-1/2 in. and over use flanges, cast bronze, companion type, ASME drilled, solder connection, 150 lb. swp.

E. Flux Materials: Flux shall comply with ASTM B813 and the provisions of the New York State Plumbing Code.

F. Solder Materials: No-lead solder, using alloys made from tin, copper, silver and nickel. Harris, Inc., "Stay-Safe 50" and "Bright", Engelhard "Silvabright 100", Canfield "Watersafe" or approved equal.

## 2.05 COPPER TUBE AND FITTINGS - PRESS FITTINGS

A. Tubing Standard: Copper tubing shall conform to ASTM B75 or ASTM B88.

B. Fitting Standard: Copper fittings shall conform to ASME B16.18, ASME B16.22, or ASME B16.26.

C. Press Fittings: Copper press fittings shall conform to the material and sizing requirements of ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM.

D. Acceptable Manufacturers: Apollo, Mueller, Nibco, Viega.

## 2.06 COPPER DRAINAGE TUBE AND FITTINGS

A. Pipe: ASTM B306, Type DWV, hard temper.
   1. Copper not allowed for urinal waste.

B. Fittings: Wrought copper, ANSI B16.29 or cast bronze, ANSI B16.23; solder end connections.

C. Flux Materials: Flux shall comply with ASTM B813 and the provisions of the New York State Plumbing Code.

D. Solder Materials: No lead solder, using alloys made from tin, copper, silver and nickel.

E. Acceptable Manufacturers: Harris, Inc., "Stay-Safe 50" and "Bright", Engelhard "Silvabright 100", Canfield "Watersafe", or approved equal.

## 2.07 HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS

A. Pipe: ASTM A74 service weight cast iron, bitumen coated.

B. Fittings: Cast iron, service weight, hub and spigot, drainage pattern, bitumen coated.

C. Connections: ASTM C564 neoprene gaskets and lubricant.

D. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

**2.08 NO-HUB CAST IRON SOIL PIPE AND FITTINGS**

A. Pipe: ASTM A888, CISPI Standard 301, no-hub cast iron, bitumen coated.
   1. For above grade only.

B. Fittings: Cast iron, no-hub drainage pattern, bitumen coated.

C. Couplings:
   1. 1-1/2 in. to 2 in.: CISPI standard 310 with 300 series stainless steel corrugated shield and clamp assembly with ASTM C564 neoprene sealing sleeve (or) same as specified for 3 in. and larger.
   2. 3 in. and Larger: 24 gauge, Type 304 stainless steel housing clamp assembly with ASTM C564 neoprene sealing sleeve, 60 in. lbs. minimum torque rating, shall meet requirements of pipe manufacturer and shall be compatible with specified pipe. Acceptable Manufacturers: Clamp-All Coupling System, Tyler "Wide Body", Husky "Series 2000", Mission "Heavy Weight", Ideal Tridon or approved equal.

D. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

**2.09 PVC SOLID WALL PIPE AND FITTINGS - DWV SYSTEM**

A. Pipe: PVC Schedule 40 solid wall pipe, iron pipe size conforming to ASTM D1785 and ASTM D2665. Pipe shall be manufactured from PVC compounds as identified in ASTM D1784. Both pipe and fittings shall conform to National Sanitation Foundation Standard 14.

B. Fittings: Type DWV, socket type conforming to ASTM D2665. Fittings shall be manufactured from PVC compounds as identified in ASTM D1784. Solvent cement joints shall be made utilizing a two-step process with primer manufactured for thermoplastic piping and solvent cement conforming to ASTM D2564.

**2.10 DIELECTRIC PIPE FITTINGS**

A. Description: Assembly or fitting having insulating material isolating joined dissimilar metals to prevent galvanic action and stop corrosion.

B. Unions: Factory fabricated, for 250 psi minimum working pressure at 180°F, threaded or solder ends, insulating material suitable for system fluid, pressure and temperature.

C. Acceptable Manufacturers: EPCO, Capitol Manufacturing, Watts or approved equal.

**2.11 HANGERS, INSERTS AND SUPPORTS**

A. Hangers, Inserts, Clamps: B-Line, Grinnell, Michigan Hanger, PHD Manufacturing.

B. Hangers:
   1. Adjustable, wrought malleable iron or steel with electroplated zinc or cadmium finish. PVC coated where in contact with copper piping.
   2. Adjustable ring type where piping is installed directly on hanger for piping 3 in. and smaller.
   3. Adjustable steel clevis type for piping 4 in. and larger.
   4. Nuts, washers and rods with electroplated zinc or cadmium finish.
   5. Provide hot dipped galvanized finish for hangers and accessories installed in exterior locations and interior areas with moist environment conditions such as pools, pool filter rooms, areaways, garages and similar areas.

C. Spacing Schedule:

| Pipe Size | Steel | Copper | Plastic | Cast Iron | Rod Size |
|---|---|---|---|---|---|
| 3/4 in. to 1 in. | 8 ft. | 6 ft. | 3 ft. | Each | 3/8 in. |

| | | | | | |
|---|---|---|---|---|---|
| 1-1/4 in. to 2 in. | 10 ft. | 6 ft. | 3 ft. | Horizontal | 3/8 in. |
| 2-1/2 in. to 4 in. | 12 ft. | 10 ft. | 4 ft. | Joint 5 ft. | 1/2 in. |
| 5 in. and over | 12 ft. | 10 ft. | 4 ft. | Maximum | 5/8 in. |
| | | | | O.C. | |

D. Cast Iron No-Hub Supports:
   1. In accordance with manufacturer's recommendations.
   2. Vertical piping supported at each stack base, at each floor and 15 ft. on center, maximum. Freestanding vertical pipe should be adequately staked or braced during construction to maintain alignment. Bases of stacks shall be supported on concrete, brick laid in cement mortar, metal brackets attached to the building construction or by other methods approved by the Owner's Representative.
   3. Horizontal piping supported within 24 in. each side of the coupling joint at 10 ft. intervals for 10 ft. pipe lengths and at 5 ft. intervals for 5 ft. pipe lengths. Supports or hangers placed to maintain alignment and grade with provision made to prevent shear. Greater than 3 in. diameter pipe braced at changes of direction to prevent horizontal movement.

E. Beam Attachments:
   1. C-Clamp style, locknut, restraining strap, electroplated finish, UL listed, FM approved for pipe sizes 2 in. and smaller.
   2. Center loaded style with clamp attachments that engage both edges of beam, electroplated finish, UL listed, FM approved, for pipe sizes larger than 2 in., refer to "Supports" for additional requirements.

F. Inserts: Carbon steel body and square insert nut, galvanized finish, maximum loading 1300 lbs., for 3/8 in. to 3/4 in. rod sizes, reinforcing rods on both sides, MSS-SP-69 Type 19 or approved equal.

G. Supports:
   1. Provide intermediate structural steel members where required for hanger attachment. Members shall span across the bar joists at panel points of joists. Secure member to structure. Select size of members based on a minimum factor of safety of four.
   2. For Weights Under 1000 lbs.: "Drill-In" inserts, "U" shaped Channel, beam clamps or other structurally reviewed support. The factor of safety shall be at least four. Follow manufacturer's recommendations.
   3. For Metal Decks: Drill hole through for hanger rods and imbed a welded plate in concrete or use devices designed for this application, with a safety factor of four.
   4. Acceptable Manufacturers: Hilti, ITW Ramset, Phillips "Red Head" or approved equal.

H. Cabinet Pipe Space Supports:
   1. Piping below casework countertops within space behind cabinet shall be supported using continuous slot metal channels with pipe clamps.
   2. Acceptable Manufacturers: B-Line, Kindorf, Unistrut or approved equal.

I. Hanger Insulation Shields:
   1. Hanger insulation shields shall be provided for all water and storm water piping. Hangers shall attach directly to pipe for all remaining services.
   2. Piping 2 in. and Smaller: Pipe insulated with glass fiber insulation shall be protected at point of support by a sheet metal shield. Shield shall be #18 gauge, galvanized steel, minimum 120 degree arc, formed to fit insulation thickness and 12 in. long. Tape shields to pipe insulation.
   3. Piping 3 in. and Larger: Pipe insulated with glass fiber insulation shall be protected at point of support by a sheet metal shield and pipe support insulation insert(s) between pipe and hanger. Shield shall be #18 gauge, galvanized steel, minimum 120 degree arc, formed to fit insulation thickness and 12 in. long. Tape shields to pipe insulation. Provide temporary blocking to maintain proper spacing for insulation.

## 2.12 PIPING ACCESSORIES

A. Escutcheon Plates: Steel or cast brass, split hinge type with setscrew, high plates where required for extended sleeves. Chrome plated in finished areas and at plumbing fixtures.

B. All cleanout plugs, bushings and nipples, required for instruments and gauges shall be brass.

C. Hubless cast iron fitting restraints shall be Holdrite Series #117 or approved equal.

## 2.13 SLEEVES

A. Standard Type:

1. Schedule 40 PVC sleeves or sheet metal sleeves for nonstructural surfaces and existing construction. Sheet metal sleeves shall be 18 gauge minimum and braced to prevent collapsing.

## 2.14 SEALING ELEMENTS

A. Expanding neoprene link type, watertight seal consisting of interlocking links with zinc plated bolts.

1. Acceptable Manufacturers: Thunderline "Link-Seal" Series 200, 300 or 400, Pyropac, Calipco.

## 2.15 FIRESTOP SYSTEM FOR OPENINGS THROUGH FIRE RATED WALL AND FLOOR ASSEMBLIES

A. Materials for firestopping seals shall be listed by an approved independent testing laboratory for "Through-Penetration Firestop Systems". The system shall meet the standard fire test for Through-Penetration Firestop Systems designated ASTM E814. Firestop system seals shall be provided at locations where piping pass through fire rated wall, floor/ceiling, or ceiling/roof assembly. Minimum required fire resistant ratings of the assembly shall be maintained by the Firestop System. Installation shall conform with the manufacturer's recommendations and other requirements necessary to meet the testing laboratory's listing for the specific installation.

## 2.16 STACK SLEEVE

A. Cast iron body with caulking recess, flashing clamp and under deck clamp.

B. Acceptable Manufacturers: Jay R. Smith Series 1720, Zurn, Wade.

## 2.17 PIPING MATERIALS AND SCHEDULE

A. See Exhibit "A", "Schedule of Piping Materials" at end of this Section for (Plumbing) piping.

B. See Exhibit "B", "Testing" at end of this Section.

# PART 3 - EXECUTION

## 3.01 EQUIPMENT AND SYSTEMS

A. Install equipment and systems in accordance with provisions of each applicable Section of these Specifications, and Local/State Codes/Regulations having jurisdiction. Accurately establish grade and elevation of piping before setting sleeves. Install piping without springing or forcing, except where specifically called for, making proper allowance for expansion and anchoring. Changes in sizes shall be made with reducing fittings. Reducing couplings are not acceptable. Arrange piping at equipment with necessary offsets, unions, flanges, and valves, to allow for easy part removal and maintenance. Offset piping and change elevation as required to coordinate with other work. Avoid contact with other mechanical or electrical systems. Provide adequate means of draining and venting units, risers, circuits and systems. Conceal piping unless otherwise called for. Copper tubing shall be cut with a wheeled tubing cutter or other approved copper tubing cutter tool. The tubing must be cut square to permit proper joining with the fittings. Ream pipes after cutting and clean before installing. Cap or plug equipment and pipe openings during construction. Install piping parallel with lines of building, properly spaced to provide clearance for insulation. Make changes in direction and branch connections with fittings. Do not install valves, unions and flanges in inaccessible locations. Materials within a system and between systems shall be consistent. If this is not possible, install dielectric fittings.

### 3.02 PIPING OVER ELECTRICAL EQUIPMENT

A. Contractor shall route piping to avoid installation directly over electric equipment, including, but not limited to panels, transformers, disconnects, starters, motor control center, adjustable speed drives and fused switches.

B. Piping shall not be installed in the dedicated electric and working space as defined by NEC 110. Dedicated electrical space is generally equal to the depth and width of electrical equipment, and extends 6 ft. above the electrical equipment, or to a structural ceiling. Dedicated working space is a minimum of 30 in. wide or the width of equipment (whichever is larger) a minimum of 6 ft.-6 in. tall, with a depth of 3ft. to 9 ft. depending on the voltage.

### 3.03 HANGERS, INSERTS AND SUPPORTS

A. Piping shall not be supported by wires, band iron, chains, from other piping, or by vertical expansion bolts. Support piping with individual hangers from concrete inserts, wood construction, welded supports, or beams clamps of proper configuration and loading design requirements for each location; replace if not suitable. Follow manufacturer's safe loading recommendations. Suspend with rods of sufficient length for swing and of size called for, using four (4) nuts per rod. Provide additional structural steel members, having one coat rustproof paint, where required for proper support. Provide oversized hangers where insulation/supports must pass between pipe and hanger. Provide continuous support or extra supports for plastic piping per manufacturer's requirements. Hangers, when attached to joists, shall only be placed at the top or bottom chord panel point. Only concentric type hangers are permissible on piping larger that 2-1/2 in.; "C" types are permitted for piping 2 in. and smaller on joists. Provide riser clamps for each riser at each floor. Use trapeze hangers where a group of piping can be installed.

B. Provide a pipe hanger within 12 inches of pipe unions and piping connections to equipment, in order to facilitate disconnections of piping without pipe sagging.

### 3.04 HANGERS ATTACHED TO JOISTS

A. Individual hangers may be suspended directly from the bottom chord panel point provided that the sum of the concentrated loads within the chord panel does not exceed 100 pounds and the attachments are concentric to the chord. (Eccentrically loaded joists using beam clamps or other attachment methods are not acceptable.)

B. For nominal concentrated loads between panel chords, which have been accounted for in the specified uniform design load for the joists, this Contractor is to provide struts to transfer the load to a panel point on the opposite chord as reviewed and acceptable by the Structural Engineer of Record.

### 3.05 PIPE CONNECTIONS

A. No-Lead Solder Connections: Nonacid flux and clean off excess flux and solder.

B. Copper Press Connections: Copper press fittings shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer.

C. Threaded Connections: Clean out tapering threads, made up with pipe dope; screwed until tight connection. Pipe dope must be specifically selected for each application.

D. Dielectric Pipe Fittings: Provide dielectric unions at ALL equipment connections where dissimilar metals meet. In addition, provide dielectric unions in all open type piping systems (condensing water, domestic water, etc.) where dissimilar metals are to be joined.

E. Solvent-Cement Plastic Piping 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. Apply primer.

2. PVC Piping: Join according to ASTM D 2855.

**3.06 SLEEVES**

A. Provide for pipes passing through floors, walls or ceilings. Not required for floors that are core-drilled, except where floor is waterproofed.

B. Extend 1/8 in. above finished floor in finished areas. In above grade Mechanical Rooms and other areas with floor drains, use steel pipe sleeves 2 in. above floor.

C. Use steel pipe sleeves in bearing wall, structural slabs, beams and other structural surfaces, and where called for.

D. Sleeves shall be as small as practical, consistent with insulation, so as to preserve fire rating.

E. Fill abandoned sleeves with concrete.

F. Provide rubber grommet seals for pipes passing through ducts or air chambers or built-up housings.

**3.07 SLEEVE PACKING**

A. Seal void space at sleeves as follows:
   1. Interior Locations: Firmly pack with fiberglass and caulk.
   2. Exterior Walls and Below Grade Cored Holes: Use sealing element.
   3. Cored Holes: Use sealing element.
   4. Fire Rated, Partitions and Floor Slabs: Use fire rated sealing elements, materials and methods. Provide per manufacturer's instructions to maintain firestop.
   5. Waterproofed Walls/Floors: Use waterproof sealing element, device or compound.

**3.08 ESCUTCHEON PLATES**

A. Provide polished chrome setscrew type escutcheon plates for all exposed piping passing through floors, walls or ceilings, in all rooms except in Boiler, Fan and Mechanical Rooms.

**3.09 TESTS**

A. Refer to Exhibit "B" at the end of this section for testing of Plumbing Systems.

B. Provide all necessary items to complete proper testing of work. Perform all testing in accordance with governing Codes, local utilities and other agencies having jurisdiction and as specified. Pay all costs to perform tests. Perform all testing in a safe manner. Isolate existing systems.

C. Domestic Water:
   1. Do not cover joints with insulation until required tests are completed and the Owner's Representative accepts the system.
   2. Make leaks tight; no caulking permitted. Replace defective fittings, pipe or connections. Piping shall be tight and show no loss of pressure.
   3. Air test not acceptable as final test.
   4. Confirm in writing that tests and flushing have been conducted and successfully completed. Submit copy of the test report to Owner's Representative.

D. Sanitary and Storm:
   1. There shall be no loss of water when testing interior piping.
   2. Air test not acceptable as final test.
   3. Should any leaks, defective joints or defective construction be detected in sewers and/or floors or walls of appurtenant structures, they shall be permanently stopped. Should any defective pipes, fittings or accessories be discovered they shall be removed and replaced at the Contractor's expense.
   4. Confirm in writing that tests have been conducted and successfully completed. Submit copy of the test report to Owner's Representative.

### 3.10 DOMESTIC WATER PIPING CLEANING AND DISINFECTION

A. Cleaning and disinfecting shall be in accordance with requirements of New York State Department of Health and authority having jurisdiction. Prior to disinfecting, flush piping to remove any sediment and debris.

B. Clean and disinfect water distribution piping systems and parts of existing potable water systems that have been altered, extended or repaired.

C. After disinfection procedures, submit water samples in sterile bottles to an approved Department of Health Laboratory. Samples shall be proven equal to the water quality served to the public from the existing water supply system and acceptable to the Department of Health. Flush and disinfect all sections of pipe that fail the laboratory tests. Submit test results indicating water is potable.

### 3.11 PIPE LINE SIZING

A. Pipe sizes called for are to be maintained. Pipe size changes made only as reviewed by Owner's Representative. Where discrepancy in size occurs, the larger size shall be provided.

### 3.12 EXHIBIT "A" - PIPING MATERIALS (PLUMBING)

| SERVICE | PIPE MATERIALS | FITTINGS | CONNECTIONS |
|---|---|---|---|
| Water service | SEE "UNDERGROUND PIPING AND ACCESSORIES" SECTION 221020 | | |
| Water service (2 in. and smaller) | SEE "UNDERGROUND PIPING AND ACCESSORIES" SECTION 221020 | | |
| Domestic water interior/hot, cold and circulating 3 in. and smaller | Type L copper | Wrought or cast copper | No-lead solder |
| | Type L copper | Wrought or cast copper | Press fit |
| Sanitary, sanitary vent, and storm (buried) | SEE "UNDERGROUND PIPING AND ACCESSORIES" SECTION 221020 | | |
| Sanitary, sanitary vent | Service weight cast iron soil pipe | Cast iron hub and spigot | Neoprene compression type gasket |
| | Service weight cast iron soil pipe | No hub | No hub neoprene gasket and stainless steel clamp assembly |
| | Type DWV copper | Wrought copper | No-lead solder |
| | Schedule 40 PVC, solid wall | PVC, socket type | Solvent cement |
| Storm | Service weight cast iron soil pipe | Cast iron hub and spigot | Neoprene compression type gasket |
| | Service weight cast iron soil pipe | No hub | No hub neoprene gasket and stainless steel clamp assembly |
| | Schedule 40 PVC, solid wall | PVC, socket type | Solvent cement |

### 3.13 EXHIBIT "B" - TESTING

| SERVICE | TEST REQUIREMENTS |
|---|---|
| Domestic water | Test hydrostatically at 150 PSI for two (2) hours or at 1.5 times the working pressure when working pressure exceeds 100 PSI |
| Sanitary, sanitary vent, storm | Maintain 10 ft. head of water for two (2) hours. |

**END OF SECTION 22 10 10**

## SECTION 22 10 20
## UNDERGROUND PIPING AND ACCESSORIES

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents

### 1.02 SUBMITTALS

A. Provide a schedule of pipe materials, fittings and connections.

### PART 2 - PRODUCTS

### 2.01 GENERAL

A. Pipe and fittings new and marked with manufacturer's name, complying with applicable ASTM and ANSI Standards.

### 2.02 REFERENCE STANDARDS

A. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2021.

B. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.

C. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2020.

D. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

E. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.

F. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2020.

G. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances; 2025.

### 2.03 CAST IRON SOIL PIPE AND FITTINGS

A. Pipe: ASTM A74 service weight cast iron, bitumen coated, hub and spigot.

B. Fittings: Service weight cast iron, bitumen coated, hub and spigot, ASTM C564 service weight neoprene gasket of same manufacturer as piping.

C. All cast iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

### 2.04 PVC SOLID WALL PIPE AND FITTINGS - DWV SYSTEM

A. Pipe: PVC Schedule 40 solid wall pipe, iron pipe size conforming to ASTM D1785 and ASTM D2665. Pipe shall be manufactured from PVC compounds as identified in ASTM D1784. Both pipe and fittings shall conform to National Sanitation Foundation Standard 14.

B. Fittings: Type DWV, socket type conforming to ASTM D2665. Fittings shall be manufactured from PVC compounds as identified in ASTM D1784. Solvent cement joints shall be made utilizing a two-step process with primer manufactured for thermoplastic piping and solvent cement conforming to ASTM D2564.

### 2.05 DETECTABLE TAPE

A. Detectable underground warning tape, 5 mil. polyethylene, 6 in. wide, aluminum backing, APWA approved background colors within permanent black lettering identifying service below.

B. Schedule:
   1. Sanitary: Green color, "Caution Buried Sewer Line Below".
   2. Storm: Green color, "Caution Buried Sewer Line Below".

3. Water: Blue color, "Caution Buried Water Line Below".
4. Gas: Yellow color, "Caution Buried Gas Line Below".
5. Electric: Red color, "Caution Buried Electric Line Below".

C. Acceptable Manufacturers: Seton, Terra Tape, Pro-Line Safety Products, Inc.

**2.06 SCHEDULE OF PIPING MATERIALS**

A. See Exhibit "A", Schedule of Piping Materials at end of this section for piping.

**PART 3 - EXECUTION**

**3.01 TESTING**

A. Sanitary and Storm:
1. Do not backfill over piping until required tests are completed and the Owner's Representative accepts the system.
2. There shall be no loss of water when testing interior piping inside the building foundation.
3. Air test not acceptable as final test.
4. Should any leaks, defective joints or defective construction be detected in sewers, floors or walls of appurtenant structures, they shall be permanently stopped. Should any defective pipes, fittings or accessories be discovered they shall be removed and replaced at the Contractor's expense.
5. Test exterior piping outside the building foundation in 100 ft. sections. The allowable rate of leakage per 24 hours per in. of diameter per 1,000 ft. of sewer tested shall not exceed 25 gallons. Piping shall be inspected and tested prior to backfill.
6. Confirm in writing that tests have been conducted and successfully completed. Submit copy of the test reports to Owner's Representative.

B. Domestic Water:
1. Do not backfill over piping until required tests are completed and the Owner's Representative accepts the system.
2. Make leaks tight; no caulking permitted. Replace defective fittings, pipe or connections. Piping shall be tight and show no loss of pressure.
3. Air test not acceptable as final test.
4. Confirm in writing that tests and flushing have been conducted and successfully completed. Submit copy of the test report to Owner's Representative.

C. Test exterior water service piping outside the building foundation hydrostatically at 200 psi for two (2) hours. The amount of leakage shall not exceed two (2) quarts per hour per 100 gaskets or joints. Conform to NFPA 24.

**3.02 DETECTABLE TAPE**

A. Provide detectable tape directly over the buried pipe lines at a depth of 1 ft. - 0 in. below finished grade. Install tape over the continuous length of the pipe.

**3.03 EXHIBIT "A" - PIPING MATERIALS (PLUMBING)**

| SERVICE | PIPE MATERIALS | FITTINGS | CONNECTIONS |
|---|---|---|---|
| Water service | (Refer to Site Utility Plans for incoming well service line) | | Mechanical |
| Sanitary and Vent | Service weight cast iron soil pipe | Cast iron, hub and spigot | Neoprene gasket compression type |
| | Schedule 40 PVC, solid wall | PVC, socket type | Solvent cement |
| Storm | Service weight cast iron soil pipe | Cast iron, hub and spigot | Neoprene gasket compression type |

| | | | |
|---|---|---|---|
| | Schedule 40 PVC, solid wall | PVC, socket type | Solvent cement |

**3.04 EXHIBIT "B" - TESTING**

| SERVICE | TEST REQUIREMENTS |
|---|---|
| Water service | Test hydrostatically at 150 PSI for two (2) hours. |
| Sanitary, sanitary vent, storm | Maintain 10 ft. head of water for two (2) hours. |

**END OF SECTION 22 10 20**

**SECTION 22 10 30**
**PUMPS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. NSF 61 - Drinking Water System Components - Health Effects; 2023, with Errata.

### 1.02 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.03 QUALITY ASSURANCE

A. Follow all requirements, recommendations and appendices to comply with the following publications, codes, standards and listings/approvals:
   1. All items here-in used to convey water for potable use shall be lead free in accordance with NSF 61, Standard 61, Section 9 - Standard for Drinking Water and Lavatory Faucets and NSF Standard 372 - Maximum Lead Requirements. Compliance shall be via third party testing and certification.

### 1.04 SUBMITTALS

A. Submit manufacturer's data in accordance with the Basic Mechanical and Electrical Requirements. Obtain approval prior to ordering material.

B. Provide submittals for all items specified under Part 2 of this Section.

## PART 2 - PRODUCTS

### 2.01 HOT WATER CIRCULATING PUMP

A. Pump: Inline wet rotor, 304 Stainless Steel, 145 psi maximum operating pressure, 230°F maximum water temperature, Aluminum Oxide Ceramic shaft, upper and lower radial bearings, Carbon thrust bearing and EPDM retainer, EP O'ring and Gaskets, PES Composite Impeller, Integral ACETAL check valves with 302 Stainless Steel spring and Nitrile Rubber Seats, flange mount.

B. Motor: Three speed, Impedance protected, non-overloading throughout the pump curve.

C. Electric On-Demand Control: Activates pump when hot water demand is initiated in the building, and turns off when there is a temperature rise or a set point on the hot water return line. Controller Features:
   1. Recirc Pump Control: Activation with hot water demand, turn off with temperature rise adjustable between 5 deg.F. and 25 deg.F., and set lockout point between 80 deg.F. and 125 deg.F.. Maximum runtime after activation of 10 minutes.
      a. Autoprime feature, pulse pump activation based on intervals between 10 minutes and 4 hours.
      b. Onboard dipswitches allow changes to other pump control modes, including on-demand, continuous, temp based, or sensor based operation.
   2. Local Data Logging and Diagnostics: Record min., max, avg. temperature points, equipment runtime, and sensor activity data to onboard SD card. Onboard LED's provide relay runtime, lockout status, and equipment runtime activity.
   3. Remote Monitoring and Control Option: Integral LCD screen for real time data and control, and status of remote connection. Optional built-in WiFi for connection to existing onsite network or hotspot with cellular connection (subscription required). View data online, configure alert notifications on any sensor, control system equipment and parameters remotely.
   4. Outputs:
      a. Relay 1- 16A normally open for recirc pump control. External relay option available for control of large pumps.

b. Relay 2 - 16A Normally Closed for boiler setpoint control or outdoor reset of a heating pump.

5. Inputs:
   a. Three (3) temperature sensors for 10k thermistors (included).
   b. One (1) dry switch activation
   c. One (1) activation input with 5v/12v DC power cord
   d. Two (2) to four (4) dry contact CT switch inputs to track equipment runtime, with optional two (2) dry contact CT ports with remote monitored models.

D. Compliance and Approvals: NSF 61, UL and IAPMO PS1 15-2007 compliance.

E. System Options:
   1. FS-100 Flow Sensor (installed on cold water make-up feed.

F. Refer to schedule on drawings for capacity and electrical characteristics.

G. Acceptable Manufacturers: Enovate AutoHot, Grundfos, Bell and Gossett.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Pumps shall be installed, aligned and started in accordance with manufacturers written installation instruction.

B. Install pumps in locations to provide access for maintenance and replacement of parts.

C. Support pumps and piping separately so that piping does not support pumps.

D. Provide the services of a factory trained mechanic to start up the system based on factory recommendations. Provide Owner instruction at time of start up. Submit three (3) copies of start up report to the Owner's Representative.

### 3.02 HOT WATER CIRCULATING PUMP

A. Install shutoff valve and strainer on pump suction; check valve, balancing valve and shutoff valve in pump discharge. Install pressure gauge on suction and discharge piping. Adjust gpm of each circulating pump to capacity as noted.

### 3.03 TESTING

A. Test hot water recirculating pumps for operation.

B. Certify in writing that tests have been performed and the systems are properly operating. Submit three (3) copies of all test reports to the Owner's Representative.

**END OF SECTION 22 10 30**

**SECTION 22 11 00**
**WATER SUPPLY**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 QUALITY ASSURANCE

A. Follow all requirements, recommendations and appendices to comply with the following publications, codes, standards, and listings/approvals:
   1. New York State Health Department.
   2. Local municipality requirements and standards.
   3. All items here-in used to convey water for potable use shall be lead free in accordance with NSF 61, Standard 61, Section 9 - Standard for Drinking Water and Lavatory Faucets and NSF Standard 372 - Maximum Lead Requirements. Compliance shall be via third party testing and certification.

### 1.03 SUBMITTALS

A. Provide submittals for all items specified under Part 2 of this Section.

## PART 2 - PRODUCTS

### 2.01 WATER PIPING

A. Piping Materials: Refer to Specification Section 221010, "Piping Systems and Accessories" and Section 221020, "Underground Piping and Accessories".

### 2.02 VACUUM BREAKERS

A. Hose Connection Type:
   1. Brass body, stainless steel working parts, rubber diaphragm and disc, drainable, non-removable feature, polished chrome for finished areas.
   2. Design Equipment: Watts #8A.
   3. Acceptable Manufacturers: Watts, Conbraco, Zurn or approved equal.

B. Pressure Type - Exterior use (Irrigation Systems):
   1. Lead free bronze body, anti-siphon and pressure vacuum type, silicone rubber seat disc, replaceable seats, ball valve shutoffs on inlet and outlet, test connections.
   2. Design Equipment: Watts #LF800M4QT.
   3. Acceptable Manufacturers: Watts, Conbraco, Zurn or approved equal.

## PART 3 - EXECUTION

### 3.01 GENERAL

A. Coordinate work with all other trades and utility companies.

B. Inspect pipe, fittings and equipment prior to installation. Remove all defective materials from the site.

C. Do not backfill until inspection by Owner's Representative.

D. Install pipe and equipment in accordance with manufacturer's recommendations and in a workmanlike manner as determined by the Owner's Representative.

### 3.02 REFERENCE STANDARDS

A. NSF 61 - Drinking Water System Components - Health Effects; 2023, with Errata.

### 3.03 WATER SERVICE

A. Install all piping on firm bed, using caution where piping passes over excavation. Provide concrete thrust blocks to support hydrant and prevent movement at all changes in direction of piping. Thrust blocks not required for Type K copper piping installation. Provide rods, clamps

and retainer glands on all elbows and fittings in accordance with manufacturer's recommendations to prevent fitting from blowing off under line pressure. Coat all clamps, rods, nuts with two coats of bitumastic.

B. Minimum earth cover shall be 5 ft. - 0 in. unless otherwise noted.

C. Water mains crossing sanitary or storm sewers shall be installed to provide a minimum vertical distance of 1 ft. - 6 inches between the outside of the pipes where the water main is above or below the sewer. Locate the water pipe so that the crossing of the sewer occurs at the mid-section of a full length of pipe. The minimum horizontal separation between water mains and sewer mains shall be 10 ft. - 0 in. measured from the outside of the pipes. If separation or distance of joints from pipe crossing cannot be established, encase water piping in 6 in. concrete for a distance 10 ft. - 0 in. each side of crossing.

**3.04 PIPING**

A. Run slightly off level to low points; provide drain valves at low points. Provide shock absorbers where shown or specified. Branch headers serving flush valves shall be full size as shown. Exposed water piping in Kitchen shall be chrome plated brass (from insulation to fixture or equipment connection.). Provide dielectric pipe fittings when connecting to piping systems of dissimilar metals. All supply piping to fixtures, faucets, hydrants and flush valves shall be anchored to prevent movement.

B. Provide shock absorbers where flush valves and quick closing valves are used as specified in Section 223010.

**3.05 CLEANING AND DISINFECTING**

A. Refer to Specification Section 221010, "Piping Systems and Accessories" for domestic water piping cleaning and disinfecting requirements.

**3.06 TESTS**

A. Provide all necessary items to complete proper testing of work. Perform all testing in accordance with governing codes, local utilities and other agencies having jurisdiction and as specified. Pay all costs to perform tests. Perform all testing in a safe manner.

B. Refer to Specification Section 221010, "Piping Systems and Accessories" for pipe testing requirements.

**END OF SECTION 22 11 00**

**SECTION 22 13 00**
**SANITARY, WASTE AND STORM DRAINAGE SYSTEMS**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 SUBMITTALS

A. Provide submittals for all items specified under Part 2 of this section.

## PART 2 - PRODUCTS

### 2.01 PLUMBING DRAINAGE SYSTEM

A. Piping Materials: Refer to Section 221010, "Piping Systems and Accessories" and 221020, "Underground Piping and Accessories" for piping materials.

### 2.02 HYDROFLUSHING

A. The hydroflushing equipment used for sewer cleaning shall be designed and constructed for sewer cleaning and be capable of removing sludge, grease, dirt and other foreign materials. It shall consist of, but not be limited to, booster pump, high pressure hose, water spray jet, cutting nozzles and all accessories required to complete the work.

## PART 3 - EXECUTION

### 3.01 GENERAL

A. Prior to commencing work, the Contractor shall verify inverts and locations. Any discrepancy between plans and field conditions shall be reported to the Owner or Engineer. No work shall start until discrepancies have been resolved. All costs related to Contractor's failure to verify and report discrepancies will be borne by the Contractor.

B. Install pipe and equipment in accordance with manufacturer's recommendations and in a workmanlike manner as determined by the Owner's Representative.

### 3.02 PIPE INSTALLATION

A. Minimum Slope: 3 in. and under - 1/4 in. per ft.; 3 in. to 6 in. - 1/8 in. per ft; 8 in. and larger - 1/16 in. per ft.

B. All underground sanitary piping shall be a minimum of 2 inch size and sloped no less than 1/4 inch per foot.

C. Urinal Waste: Copper is not allowed.

D. Slope piping as indicated on drawing; verify inverts given. Inspect piping before installation to detect apparent defects. Remove defective piping from site. Lay piping beginning at low point of system, true to grades and alignment indicated, with unbroken continuity of invert. Install piping and gaskets in accordance with manufacturer's recommendations and other special installation requirements. Clean interior of piping of dirt and other foreign material as work progresses. Place plugs in ends of pipe at end of day or whenever work stops. Flush lines if required to remove collected debris.

E. Inspect piping to determine whether line displacement or other damage has occurred. Make inspections after lines have been installed and approximately 2 ft. of backfill is in place, and again at completion of project. If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects, and reinspect.

### 3.03 HYDROFLUSHING

A. Upon completion of the project, mechanically auger and hydroflush clean all new buried sanitary, waste and storm drainage piping 4 in. and larger. Use cutting nozzles when applicable. Do not mechanically auger or use cutting nozzles when piping is plastic piping.

B. Hydroflush piping utilizing full length of jet hose. Thoroughly flush all piping for 30 minutes upon completion of hydroflushing. Piping shall be clean.

C. Field check existing piping layout prior to commencement of cleaning operations. Take all precautions to prevent water leaks within the buildings.

D. Determine the existing sewer materials prior to cleaning. Should pipe be any material other than cast iron, do not proceed. Notify Owner's Representative.

E. All hydroflushing of drain lines shall be performed against the direction of flow of the waste water, unless otherwise noted.

F. Restore all areas disturbed to match existing.

G. The cleaning and flushing services shall be performed by one approved service firm.

**3.04 TESTING**

A. Refer to Specification Section 221010, "Piping Systems and Accessories" for pipe testing requirements.

**END OF SECTION 22 13 00**

**SECTION 22 30 10**
**EQUIPMENT**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ASSE 1017 - Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems; 2023.

### 1.02 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Document.

### 1.03 SUBMITTALS

A. Provide submittals for all items specified under Part 2 of this section.

## PART 2 - PRODUCTS

### 2.01 FLOOR DRAINS

A. Drain Description: All Floor Drains Type A unless otherwise noted.
   1. Type A: Cast iron body, flashing collar with weepholes, nickel bronze, 7 in. diameter adjustable strainer; Jay R. Smith Figure #2010-A.
   2. Type B: Cast iron body, flashing collar with weepholes, 8 in. diameter cast iron grate medium duty, removable sediment bucket; Jay R. Smith Figure #2110.

B. Make: Josam, Jay R. Smith, Mifab, Watts or Zurn.

### 2.02 ROOF DRAINS

A. Drain Description: All Roof Drains Type A unless otherwise noted.
   1. Type A: Coated cast iron body with round sump and flange, bottom threaded outlet, cast iron removable locking type dome, deck clamp, receiver, cast iron bolted flashing clamp ring integral with V-notched gravel stop with adjustable extension; Jay R. Smith Figure #1015.
   2. Type B: (Secondary overflow roof drain) Coated cast iron body with round sump and flange, bottom outlet, removable cast iron locking type dome, deck clamp, sump receiver, cast iron bolted flashing clam ring integral with V-notched gravel stop, adjustable extension, standpipe type water dam, no hub outlet; Jay R. Smith Figure #1074.

B. Expansion Joints:
   1. Coated cast iron, bronze sleeve, packing gland, bolted pressure ring; Jay R. Smith Figure #1710.

C. Downspout Nozzles
   1. Cast bronze nozzle and flange, machined nozzle that slips over cast iron pipe, nickel bronze finish and bird screen. J.R. Smith Figure 1771
   2. Stainless steel type 304 downspout cover with hinged perforated cover. J.R. Smith Figure 1775

D. Make: Josam, Jay R. Smith, Mifab, Watts or Zurn.

### 2.03 CLEANOUTS

A. Floors: Cast iron body, nickel-bronze top with adjustable feature, bronze plug and flashing clamp where required, carpet marker and tile cover where applicable; Jay R. Smith Series #4028.

B. Walls: Cast iron ferrule, with bronze plug and stainless steel smooth access cover.
   1. Horizontal: Jay R. Smith Figure #4402.
   2. Vertical: Jay R. Smith Figure #4531.

C. Yard Cleanout:

1. Cast iron body, adjustable round heavy duty top, with tractor cover, vandal proof screws and bronze plug; Jay R. Smith Figure #4246.

D. Make: Josam, Jay R. Smith, Mifab, Watts or Zurn.

**2.04 WALL HYDRANTS**

A. Recessed box type hose connection, quarter turn valve, nonfreeze type, 3/4 in. hose connection, self draining, integral vacuum breaker with vandal resistant cap, loose key control, wall clamp and stainless steel box with nickel bronze face; Jay R. Smith Figure #5509QT.

B. Make: Jay R. Smith, Prier, Watts, Woodford or Zurn.

**2.05 HOSE BIBBS (INTERIOR)**

A. Inside sill faucet, vacuum breaker, lead-free, solder connection, 3/4 in. hose thread outlet, lock shield cap, loose key control, flanged female inlet, polished chrome plate finish for finished rooms, rough chromium for unfinished rooms.

B. Make: Woodford Model 84, Prier, Chicago Faucets or Acorn in finished room; Chicago Faucets #998 in Mechanical Rooms, Boiler Room, Penthouse, or other unfinished rooms.

**2.06 SHOCK ABSORBERS**

A. Hydropneumatically controlled with permanently sealed expansion chamber pre-charged with non-combustible gas; lead-free, threaded connection, meets or exceeds Plumbing and Drainage Institute Standard PDI WH-201 and ASSE Standard 1010.
   1. Bellows Type: Stainless steel construction with stainless steel bellows.
   2. Piston Type: Hard drawn copper body with brass piston, cap and adapter, and elastomer seals.

B. Elastomer or rubber compound type bellows not allowed.

C. Make: Watts #LF15M2, Precision Plumbing Products, Jay R. Smith, or Zurn.

**2.07 TRAP GUARDS**

A. Elastomeric, normally closed seal to prevent evaporation of P-traps. Inserts into throat of floor drain. Provide for each new floor drain.

B. Make: ProVent Systems, Inc. "ProSet Trap Guard".

**2.08 WATER PRESSURE GAUGES**

A. Construction to be Bourdon tube type; 4-1/2 in. diameter, minimum dial face, stamped stainless steel, replaceable glass lens, with snap-on rings. Phosphor bronze tube, bronze bushed rotary movement, silver brazed or soldered to brass socket and brass tip, 1/4 in. bottom connection. Accuracy, on (1.0) percent of included scale range. White dial face with black numerals, graduated in pounds; equipped with bronze pulsation dampener or snubber and needle valve.

B. Make: Trerice, Weiss, Weksler, Winters.

**2.09 PIPING SYSTEM THERMOMETERS**

A. Industrial type, plastic, aluminum or steel case, glass or plastic front, non-toxic organic liquid filled, red reading column, white or silver V-shaped scale, black numerals. Union flange mounted, separable socket with thermowell, extension necks were required; range as called for service. Universal adjustable type, 9 in. scale. For installation in water systems where the maximum temperature is less than 120°F, graduations of 1°F, accurate to within 1/2°F. For installation greater than 120°F, graduations of 2°F, accurate to within 1°F.

B. Make: Trerice, Weiss, Weksler, Winters.

**2.10 TEMPERATURE MIXING VALVE - ELECTRONIC TYPE**

A. Valve shall mix 140°F hot water with 40°F cold water to obtain a water outlet temperature of 120°F.
   1. Valve shall have 1 in. inlet and 1-1/4 in. outlet. Flow capacity of 37 gpm at 5 psi pressure drop, and 78 gpm at 20 psi pressure drop. Minimum system draw shall be 0.5 gpm.

B. Dual, lead free digital water temperature control and monitoring system shall feature 3.5" full-color touchscreen interface which is configurable on location and does not require factory pre-programming. System shall control water temperature to +/- 2°F in accordance with ASSE 1017 and resist "temperature creep" during periods of low/zero demand.
   1. Controller shall be password protected and feature a user-adjustable outlet temperature range of 60 - 180°F with high and low temperature alerts, and an approach temperature of 2°F.

C. System shall digitally control and monitor mixed outlet temperature. Controller shall integrate with building automation systems (separate module not required) through BACnet and Modbus protocols and feature local and remote temperature alarms. System will feature a user-set, high-temperature sanitization mode for thermal disinfection of bacteria and a programmable temperature set back feature to improve energy efficiency. System will also feature high speed actuator with override feature. In the event of a power failure, system will open full cold supply. In case of a loss of cold water, the system will close hot water supply.

D. System shall be listed/approved to ASSE 1017, cUPC, NSF, CSA 24/UL873 and BTL (BACnet Testing Laboratories)

E. Provide valves on hot, cold and tempered water piping with fittings, nipples, trim piping and escutcheon plates. Horizontal stem dial thermometers on hot, cold and tempered water piping.

F. Design Equipment: Powers LFIS100VL.

G. Acceptable Manufacturer: Powers, Leonard, Symmons, Watts.

### 2.11 HYDROPNEUMATIC PRESSURE TANK AND ACCESSORIES

A. Well-X-Trol Model No. WX-251, Bladder type hydropneumatics pressure tank to accept incoming well water supply. 62 gallon tank volume, 0.55 max. acceptance volume. 22” diameter x 47” high with factory attached base ring. 1-1/4” NPTF system connection. Provide tank as specified with the following required accessories:
   1. Pressure switch set at 50/70 psi. coordinate power supply with electrical contractor and site well pump installer.
   2. 1-1/4” brass or stainless “tank tee” 1-1/4” male threaded connections on all three branches. Pre-manufactured tee to include tappings for pressure gauge, relief valve, drain valve, and pressure switch listed above.
   3. ½” boiler drain type valve
   4. Relief valve
   5. Pressure gauge
   6. Fittings required to transition from incoming 1” well pump supply line to 1-1/4” tank tee listed above.
   7. Refer to drawing detail 1/P501for piping schematic and tie-in to new UV water treatment system.

## PART 3 - EXECUTION

### 3.01 EQUIPMENT CONNECTIONS

A. Plumbing Contractor shall:
   1. Provide all roughing and final water, waste, vent, gas, air, vacuum, diesel and/or oxygen connections to all equipment requiring same as called for on Contract Documents.
   2. Refer to Contract Documents for roughing schedules, and equipment and lists indicating scope of connections required.
   3. Provide loose key stops, "P" traps, tailpieces, adapters, gas or air cocks and all necessary piping and fittings from roughing point to equipment.
   4. Provide for installation of sinks, faucets, traps, tailpieces provided by an Equipment Contractor. These items to be delivered, in easily identified cartons, to the proper room for Contractor's installation.
   5. Install controls and devices furnished by others.
   6. Install relief valve discharge piping from equipment relief valves.

7. Provide for Owner furnished equipment:
    a. Connect complete and ready for use, including all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, insulation, sheet metal work, controls, dampers, etc., as required by Owner.

**3.02 ROOF DRAINS**

A. Install according to manufacturer's written installation instructions.

B. Clean drains and strainers just prior to final inspection.

C. Provide expansion joints for roof drains located more than 25 ft. - 0 in. above finished floor.

**3.03 CLEANOUTS**

A. Install cleanouts out of traffic patterns and flush to floor. Provide offset from sanitary line served. Do not locate under doors or under lockers. Maintain distance between cleanouts on piping 4 in. and smaller, 50 ft.; over 4 in., 100 ft. At changes in direction greater than 45°. Install at base of soil, waste, vent, stacks and roof conductors and where called for.

B. Cleanouts: Same nominal size as pipe, but not larger than 4 in.

**3.04 WALL HYDRANTS**

A. Install minimum 24 in. above grade.

**3.05 HOSE BIBBS**

A. Install at low points of piping system.

**3.06 SHOCK ABSORBERS**

A. Install in vertical position.

**3.07 THERMOMETERS**

A. Provide on piping system where called for and shown, with thermometer well at each location, mounted in oversize tee or elbow to provide as little restriction as possible to fluid flow, stems or proper length to allow accurate reading. Arrange to be easily read from floor.

B. Select range such that the maximum system working temperature is in the middle one-third of the scale.

**3.08 PRESSURE GAUGES**

A. Provide in piping system where called for and shown, with needle valve and pulsation damper or snubber at each location. Arrange to be easily read from the floor.

B. Select range such that the maximum system working temperature is in the middle one-third of the scale.

**3.09 TEMPERATURE MIXING VALVE**

A. Provide where called for. Provide 2 ft. - 0 in. deep heat trap on hot water supply line ahead of connection to mixing valve.

B. Provide factory-trained technician to start up, adjust and inspect the mixing valve and piping for correct installation and temperature adjustment.

**3.10 HYDROPNEUMATIC TANK SYSTEM**

A. Connect tank piping to new 1” well water supply. Coordinate with site utility contractor.

B. Coordiante with electrical contractor for final connection to installed pressure switch (well pump control).

**END OF SECTION 22 30 10**

**SECTION 22 34 00**
**WATER HEATERS**

## PART 1 - GENERAL

### 1.01 SCOPE OF WORK

A. Work of this section shall be performed in accordance with the requirements of the Contract Documents, including but not limited to Instructions to Bidders, Agreement and General Conditions, General Requirements and Basic Mechanical/Electrical Requirements.

B. Provide labor, materials, equipment and services to perform work and related work required by Contract Documents for a complete operating system.

### 1.02 SUBMITTALS

A. Submit manufacturer's data for approval in accordance with Basic Mechanical/Electrical Requirements. Obtain approval prior to ordering material.

B. Provide submittals for all products to be installed including, but not limited to:
   1. Water Heater.
   2. Tank Protective Valves.
   3. Expansion Tank.
   4. All Heater and Tank Accessories.
   5. All System Wiring Diagrams.

### 1.03 SPECIAL COORDINATION

A. Coordinate all work of other trades in Mechanical Room.

B. Furnish Division 26 "Electric" with dimensional drawings showing location of electrical connections, location of equipment mounted on walls, and of other equipment requiring electrical connections, removals or replacements.

## PART 2 - PRODUCTS

### 2.01 WATER HEATER - ELECTRIC, TANK TYPE

A. 55 gallon, glass lined 125 PSI Non-ASME certified and stamped storage tank with individually fused elements per NEC. Total kW to be 5.5 at 208 volts, 1 phase with recovery of 25 gph at 90□F rise. Three (3) year commercial warranty.

B. Provide high temperature limit, operating temperature control and magnesium anode rods, insulation to meet current energy codes.

C. Provide temperature and pressure relief valve, ASME stamped and rated for full heating capacity. Pipe relief to drain.

D. Design Equipment: Bradford White Model No. LE255T3-3

### 2.02 THERMAL EXPANSION TANK

A. Vertical steel expansion tank constructed and designed per ASME Code Section VIII, 125 PSI working pressure, steel outer shell, rigid polypropylene liner, heavy duty butyl rubber diaphragm and non-ferrous system connection tapping, suitable for potable hot water, factory pre-charged at 55 PSI. Tank will have a 12 in. diameter and a height of 14 in. with a 6.4 gallon total volume and 0.80 maximum acceptance factors. The manufacturer will be similar to Model ST-12C by Amtrol, Wessel or approved equal.

B. Design Equipment: Amtrol.

### 2.03 TANK PROTECTIVE VALVES

A. Temperature and Pressure Relief Valve:
   1. ASME stamped and rated (for steam or hot water).
   2. Size for full heat input.
   3. Valve shall be sized and selected by manufacturer for tank and heater installed.
   4. Make: Camco, Cash-Acme, Watts, or approved equal.

## PART 3 - EXECUTION

### 3.01 WATER HEATERS

A. Install each heater on a 6 in. high concrete pad.

B. Pipe pressure and temperature relief valve drain to discharge to nearest floor drain.

C. Provide all electric wiring and equipment in accordance with manufacturer's wiring diagrams and instructions. Make all final connections.

D. Provide all piping, valves and fittings in accordance with manufacturer's piping instructions. Make all final connections.

E. Provide equipment in accordance with contract drawings and all local codes.

F. Provide start-up services of a factory trained technician to inspect the installation based on factory recommendations. Items include but are not limited to:
   1. Verification of proper piping arrangement.
   2. Verification of proper temperature rise across heater(s).
   3. Operating and safety controls.
   4. Proper operation of equipment.
   5. Verification of piping arrangement and aquastat location.
   6. All control settings.

G. Submit three (3) copies of startup reports in writing with all factory checkout data signed by the factory authorized service agent to the Owner's Representative.

H. Place equipment in operation.

I. The installation of water heaters shall be based on the details shown on the drawings and specified in this Section. Approved water heaters provided other than type shown or specified shall be installed in accordance with manufacturer's recommended installation instructions and piping diagrams.

**END OF SECTION 22 34 00**

**SECTION 22 40 00**
**PLUMBING FIXTURES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Flush valve water closets.

B. Wall hung urinals.

C. Lavatories.

D. All-in-one lavatory system.

E. Sinks.

F. Under-lavatory pipe supply covers.

G. Shower receptors.

H. Showers.

I. Indoor drinking fountains.

J. Bottle filling drinking fountains.

K. Bi-level, electric water coolers.

L. Mop sinks.

### 1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).

C. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).

D. ASME A112.18.1 - Plumbing Supply Fittings; 2018, with Errata.

E. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).

F. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2018, with Errata.

G. ASME A112.19.3 - Stainless Steel Plumbing Fixtures; 2022.

H. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2022.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

J. IAPMO Z124 - Plastic Plumbing Fixtures; 2022, with Editorial Revision.

K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

L. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

M. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

N. NSF 61 - Drinking Water System Components - Health Effects; 2023, with Errata.

O. NSF 372 - Drinking Water System Components - Lead Content; 2022.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

## 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

## 1.05 DELIVERY, STORAGE, AND HANDLING

## 1.06 WARRANTY

A. See Section 01 78 00 - 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.

## 2.02 REGULATORY REQUIREMENTS

A. Comply with applicable codes for installation of plumbing systems.

## 2.03 FLUSH VALVE WATER CLOSETS

A. Water Closets Wall Hung:
   1. Vitreous china, ASME A112.19.2, wall hung, siphon jet flush action, china bolt caps.
   2. Bowl: ASME A112.19.2; 16.5 inches (420 mm) high with elongated rim.
   3. Flush Valve: Exposed (top spud).
   4. Flush Operation: Sensor operated.
   5. Handle Height: 44 inches (1117 mm) or less.
   6. Manufacturers:
      a. Basis of Design: TOTO USA, Wall-Hung Toilet, # CT708UG; www.totousa.com
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Flush Valves:
   1. Valve Supply Size: 1 inch (25 mm, DN).
   2. Manufacturers:
      a. Basis of Design: TOTO USA, Sensor, Ecopower Diaphragm Flushometer Valve, Model: TET1GA32#CP; 1.6GPF: www.totousa.com
      b. Substitutions: See Section 01 60 00 - Product Requirements.
   3. Sensor-Operated:
      a. Type: ASME A112.19.5; chloramine-resistant clog-resistant dual-seat diaphragm valve complete with vacuum breaker, stops and accessories.
      b. Mechanism: Solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
      c. Supplied Volume Capacity: 1.6 gal (6.1 L) per flush.
   4. Metering Type: Easily accessible adjustment nut.

C. Water Closets, Floor Mounted:
   1. Vitreous china, ASME A112.19.2, floor mounted, siphon jet flush action, china bolt caps.
   2. Bowl: ASME A112.19.2; 16.5 inches (420 mm) high with elongated rim.
   3. Flush Valve: Exposed (top spud).
   4. Flush Operation: Sensor operated.
   5. Manufacturers:
      a. Basis of Design: TOTO USA, Commercial Floor-Mounted Toilet, # #MS626124CEF; www.totousa.com
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Flush Valves:
   1. Valve Supply Size: 1 inch (25 mm, DN).

2. Manufacturers:
    a. Basis of Design: TOTO USA, Sensor, Ecopower Diaphragm Flushometer Valve, Model: TET1GA32#CP; 1.28PF: www.totousa.com
    b. Substitutions: See Section 01 60 00 - Product Requirements.
3. Sensor-Operated:
    a. Type: ASME A112.19.5; chloramine-resistant clog-resistant dual-seat diaphragm valve complete with vacuum breaker, stops and accessories.
    b. Mechanism: Solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
    c. Supplied Volume Capacity: 1.6 gal (6.1 L) per flush.
4. Metering Type: Easily accessible adjustment nut.

E. Institutional Ligature-Resistant Water Closets:
1. Type 304 stainless steel, ASME A112.19.3, floor mounted, siphon jet flush action, vandal-resistant bolt caps.
2. Flush Valve: Exposed or top spud.
3. Flush Operation: Sensor operated.
4. Handle Height: 44 inches (1117 mm) or less.

F. Institutional Ligature-Resistant Flush Valves:
1. Type: ASME A112.18.1, diaphragm type, complete with vacuum breaker, stops and accessories.

G. Toilet Seats:
1. Manufacturers:
    a. Basis of Design: TOTO USA, Heavy Duty Commercial: www.totousa.com
    b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Plastic: selected by Architect from manufacturer's standard finish, open front, extended back, self-sustaining hinge, brass bolts, with cover.

H. Water Closet Carriers:
1. Manufacturers:
    a. Grohe America, Inc: www.grohe.com/us/#sle.
    b. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
    c. JOSAM Company: www.josam.com/#sle.
    d. Zurn Industries, LLC: www.zurn.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.
2. ASME A112.6.1M; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

## 2.04 WALL HUNG URINALS

A. Manufacturers:
1. Basis of Design: TOTO USA, INC. Model #UT104E(V); www.totousa.com
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Vitreous china, ASME A112.19.2, wall hung with side shields and concealed carrier.
1. Consumption Volume: 1.0 gal (3.7 L) per flush, maximum.
2. Flush Valve: Exposed (top spud).
3. Flush Operation: Sensor operated.
4. Trapway Outlet: Integral.
5. Outlet Size and Location: 2 inches (50 mm), rear side.

C. Flush Valves:
1. Manufacturers:
    a. Basis of Design: TOTO USA, INC. Model #: TEU1LA12#CP; www.totousa.com
2. Sensor-Operated:

a. Type: ASME A112.19.5; chloramine-resistant, clog-resistant dual-seat diaphragm valve with vacuum breaker, stops and accessories.
b. Mechanism: Solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
c. Supplied Volume Capacity: 1.2 gal (4.5 L) per flush.

D. Urinal Carriers:
1. Manufacturers:
a. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
b. JOSAM Company: www.josam.com/#sle.
c. Zurn Industries, LLC: www.zurn.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.
2. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

## 2.05 LAVATORIES

A. Manufacturers:
1. Basis of Design: TOTO USA, INC. ; www.totousa.com
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall-Hung Basin:
1. Products:
a. Basis of Design: TOTO USA, INC. Model ##LHT242(G), Wall Hung Lavatory, with back; www.totousa.com
b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Carrier:
a. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded studs for fixture hanger, bearing plate and studs.
b. Manufacturers:
1) Jay R. Smith MFG. Co: www.jrsmith.com/#sle.
2) JOSAM Company: www.josam.com/#sle.
3) Zurn Industries, LLC: www.zurn.com/#sle.
4) Substitutions: See Section 01 60 00 - Product Requirements.

C. Under-Mount Basin:
1. Vitreous China: ASME A112.19.2; white interior, oval shape, front overflow, seal of putty, caulking, or concealed vinyl gasket, and white exterior finish. Size as indicated on drawings.
2. Products:
a. Basis of Design: TOTO USA, INC. Model #LT231, Atherton Undercounter Lavatory; www.totousa.com
b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Supply Faucet:
1. Wall Mounted Faucet Manufacturers:
a. Basis of Design: TOTO USA; Faucet: Sensor, Model GF Single-Handle Faucet; Model #TLG11301U: www.totousa.com.
b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Deck Mounted Faucet Manufacturers:
a. Basis of Design: TOTO USA; Faucet: Sensor, Model TEL115-D10E: www.totousa.com.
b. Substitutions: See Section 01 60 00 - Product Requirements.
3. ASME A112.18.1; chrome plated combination supply fitting with pop-up waste, water economy aerator with maximum flow of 2.2 gpm (8.3 L/min), indexed handles.

## 2.06 ALL-IN-ONE LAVATORY SYSTEM

A. Manufacturers:
   1. Basis of Design: Sloan AER_DEC Model #AD-8200; wall mount, 2 station; faucet, soap dispenser, hand dryer: www.sloan.com
   2. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.07 SINKS

A. Manufacturers:
   1. Basis of Design: Elkay: www.elkay.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Single Compartment Bowl, Top Mount
   1. ASME A112.19.3; 25 by 22 by 12-1/8 inch (_____ by _____ by _____ mm) outside dimensions, 16 gauge , 0.0598 (1.518 mm) thick, type 304 stainless steel, self-rimming and undercoated, with ledge back drilled for trim.
   2. ADA Accessible ASME A112.19.3; 19 by 17 by 6-1/2 inch (_____ by _____ by _____ mm) outside dimensions, 20 gauge, 0.0375 inch (0.95 mm) thick, type 304 stainless steel, self-rimming and undercoated, with ledge back drilled for trim.
   3. Products:
      a. Basis of Design: Elkay, model Lustertone: www.elkay.com.
      b. Basis of Design: Elkay, ADA model Celebrity: www.elkay..com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Double Compartment Bowl, Top Mount:
   1. ASME A112.19.3; 33 by 22 by 9 inch (_____ by _____ by _____ mm) outside dimensions, 18 gauge, 0.050 inch (1.27 mm) thick, type 304 stainless steel, self- rimming and undercoated, with ledge back drilled for trim.
   2. Products:
      a. Basis of Design: Elkay, model LR3322: www.elkay.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Undermount-Installed Single Compartment Bowl:
   1. ASME A112.19.3, stainless steel, 33-1/2 by 18 by inch 10 (_____ by _____ by _____ mm), 16 gauge , 0.0598 (1.518 mm), type 304 stainless steel.
   2. Undercoated bottom sound deadening pads.
   3. Products:
      a. Basis of Design: Elkay, model Crosstown: www.elkay.com.
      b. Basis of Design: ADA accessible; Elkay model Lustertone Classic, ELUHAD141845PD: www.elkay.com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

E. Kitchen Faucets:
   1. Manufacturers:
      a. Basis of Design: Delta Faucet: www.deltafaucet.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Single Handle Faucet with Three-Function Pulldown Spray Head:
      a. Type: Deck-mount, swivel faucet with mounting plate.
      b. Spray Functions: Stream, full spray and pause at 1.8 gpm (6.8 L/min), maximum.
      c. ASME A112.18.1, ADA Standards, and NSF 61 compliant assembly.
      d. Materials: Ceramic disc-cartridge valve on brass body with polished chrome finish.
      e. Products:
         1) Basis of Design: Delta Faucet, Model #9159-DST: www.deltafaucet.com.

## 2.08 UNDER-LAVATORY PIPE SUPPLY COVERS

A. Manufacturers:
   1. Plumberex Specialty Products, Inc: www.plumberex.com/#sle.

B. 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 (3.2 mm) PVC with antimicrobial, antifungal and UV resistant properties.
      a. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
      b. Comply with ICC A117.1.

## 2.09 SHOWER RECEPTORS

A. Solid Surfacing Shower Receptors: Solid plastic resin casting, self-supporting, for installation over conventional subfloor; complying with IAPMO Z124.
   1. Material: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, renewable material filler, and pigments; homogenous, nonporous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
   2. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 450 or less, Class A, when tested in accordance with ASTM E84.
   3. Finish on Exposed Surfaces: Provide satin or matte, gloss rating of 3 to 20.
   4. Color and Pattern: As selected by from manufacturer's full line.
   5. Manufacturers:
      a. Basis of Design: Claron Bathware; www.clarionbathware.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Drain Trim: Removable chrome-plated strainer and tail piece.

C. ADA Solid Surfacing Shower Receptors: Solid plastic resin casting, self-supporting, for installation over conventional subfloor; complying with IAPMO Z124.
   1. Material: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, renewable material filler, and pigments; homogenous, nonporous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
   2. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 450 or less, Class A, when tested in accordance with ASTM E84.
   3. Finish on Exposed Surfaces: Provide satin or matte, gloss rating of 3 to 20.
   4. Color and Pattern: As selected by from manufacturer's full line.
   5. Manufacturers:
      a. Basis of Design: Claron Bathware; www.clarionbathware.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.10 SHOWERS

A. Shower Trim:
   1. Single Handle: ASME A112.18.1; lever-handle operated, pressure balanced mixing valve with integral service stops, bent shower arm with adjustable spray ball joint shower head with maximum flow, and escutcheon.

B. Shower Valve:
   1. Comply with ASME A112.18.1.
   2. Provide with integral thermostatic mixing valve to supply 1.5 gpm (5.6 L/min).
   3. Manufacturers:
      a. Basis of Design: Delta Lahara Bath Collection Model: Shower only #142938-H2O Series: www.deltafaucet.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Shower Slide Bar:
   1. NSF Standard: Comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects," for shower materials that will be in contact with potable water.
   2. Shower Faucets and Mixing Valve:

a. Provide Optional Delta H2OKindetic 3-Setting Slide Bar4 Hand Shower
b. Supply Connections: NPS 1/2.

D. Shower Seat: #400-33.5" SDL Folding Seat

E. Curtain and Rod: #CR-35 1/2 Curtain Rod and Curtain

F. Collapsible Threshold Kit 2.5a

**2.11 INDOOR DRINKING FOUNTAINS**

**2.12 BOTTLE FILLING DRINKING FOUNTAINS**

A. Manufacturers:
1. Basis of Design: Elkay Manufacturing Company; Model #LZWSM8K : www.elkay.com/#sle.

**2.13 BI-LEVEL, ELECTRIC WATER COOLERS**

A. Manufacturers:
1. Basis of Design: Elkay Manufacturing Company dual height ADA; Elkay #LZS-LRPBM28K.: www.elkay.com/#sle.
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Water Cooler: Bi-level, electric, mechanically refrigerated; surface mounted, ADA compliant; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
1. Capacity: 8 gph (30.3 Lph) of 50 degrees F (10 degrees C) water with inlet at 80 degrees F (27 degrees C) and room temperature of 90 degrees F (32 degrees C), when tested in accordance with ASHRAE Std 18.
2. Electrical: 115 VAC, 60 Hertz compressor, 6 foot (2 m) cord and plug for connection to electric wiring system including grounding connector.

**2.14 MOP SINKS**

A. Terrazzo Mop Sink Manufacturers:
1. Basis of Design: Fiat, Service Basin, Model #TSB-300 32" x 32": www.fiatproducts.com
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Material: Precast terrazzo composed of marble chips cast in Portland cement.

C. Type: Rectilinear, standard height.

D. Grid strainer: Stainless steel; integral; removable.

E. Rim Guard: On front top surfaces.

F. Accessories:
1. Standard: ASME A112.18.1/CSA B125.1.
2. Service Sink Faucet: Fiat 830AA
3. Hose/Bracket Combination: 832AA
4. Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless-steel wall flange.
5. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
6. Operation: Loose key.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

**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 components level and plumb.

### 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

### 3.06 CLEANING

A. Clean plumbing fixtures and equipment.

### 3.07 PROTECTION

A. Protect installed products from damage due to subsequent construction operations.

B. Repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION 22 40 00**

**SECTION 22 67 00**
**WATER TREATMENT EQUIPMENT**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform work and related work required by Contract Documents for a complete operating system.

### 1.02 SUBMITTALS

A. Submit manufacturer's data in accordance with Basic Mechanical/Electrical Requirements and Division 01. Obtain approval prior to ordering material.

B. Provide submittals for all products specified under Part 2 of this Section as well as the following:
   1. All pretreatment equipment including electrical devices and controls.
   2. All post-treatment equipment including electrical devices and controls.
   3. Wiring diagrams for all electrical power and control connections.
   4. Final equipment layout.
   5. Final piping layout.

### 1.03 QUALITY ASSURANCE

A. Follow all requirements, recommendations and appendices to comply with the equipment manufacturer's specifications and instruction manuals.

B. Equipment selected to provide a complete water treatment system shall be supplied by a single manufacturer. Items purchased from various manufacturers will not be accepted.

C. The equipment manufacturer shall have at least five (5) years' experience with water treatment installations.

### 1.04 REGULATION REQUIREMENTS

1. UV Disinfection Assembly equipment must meet the following: NSF Standard 61 and Standard 55 Class A certified. No exception per New York State Department of Health Regulations for Water Disinfection.

## PART 2 - PRODUCTS

### 2.01 PIPING

A. Refer to Specification Section 221010, "Piping Systems and Accessories".

### 2.02 VALVES

A. Refer to Specification Section 220523, "Valves".

B. Sampling Ports/Valves. Refer to drawing P201 for location and quantity of sampling stations.
   1. Ball valve or drain valve type fitting. Polished brass, smooth bore outlet.
   2. Boiler drain type valves with hose threads are not acceptable.

### 2.03 SEDIMENT FILTER (SF-1)

A. Provide one (1) single stainless steel cartridge housing tank, with (2) two 20 micron filter cartridges as follows:
   1. 316 SS housing material.
   2. Service Flow: 50 GPM.
   3. Pipe Size: 2 in.

B. Design Equipment: Watts Series PWHSJUMBO Model No. PHSJUM40 @ 50 gpm. Watts Jumbo Filter Cartridge Series "40" Model No. PWJPL40M100, 20 micron filter. (provide initial cartridge and one subsequent spare cartridge and turn spare over to owner)

### 2.04 ULTRAVIOLET STERILIZER (UV-A, UV-B)

A. Provide (2) two, vertical, stainless steel, self-contained, 20 gpm, ultraviolet water purifiers. Type 316L SST stainless housing rated for 300 PSI, with remote control panel for each unit.

Removable UV lamps quartz sleeve. Units will be piped in parallel for normal operation of all three units. System design at 40 gpm, system can operate on any two units at one time. Specific required items/accessories listed below:

1. No. of UV Lamps (each unit): 1.
2. Flow Rate: (each unit, UV-A, B): 20 GPM.
3. Pipe Sizes: 1-1/4 in.
4. Electrical Requirements: 120/1/60. Power consumption 160 watts, Ultraviolet lamp output: 140 watts.
5. Quartz sleeve on UV lamp.
6. Quick lamp change caps without the need for shutdown of water pressure.
7. Removable flange head.
8. Drain plug.
9. 1-1/4" solenoid valve on outlet of each unit.
10. Inlet chamber ports will integrate a maximum 20 gpm flow restrictor.
11. Flow Meter with control panel interface wiring/cabling.
12. UV Sensor. Mounted to UV lamp chamber. Include control panel interface wiring/cabling.
13. UV Housing Cooling Fan Assembly. Include control panel interface wiring/cabling.
14. Control Panel, Controller interface. (One control panel required for each UV unit/assembly). Lamp status and monitoring control device required. Include BMS Communication option on each control panel. Each panel will be capable of providing the following: Audible Alarm, Audible Alarm Mute, Replacement lamp counter reset, Lamp operation indicator, Controller operation indicator, Solenoid valve operation indicator, cooling fan operation indicator, UV Sensor reading indicator, and Flow Meter operation indicator.
15. UV Disinfection Assembly equipment must meet the following: NSF Standard 61 and Standard 55 Class A certified. No exception per New York State Department of Health Regulations for Water Disinfection.
16. The two UV units are to be installed vertically side by side. The two control panels are to be wall mounted side by side.
17. Provide Uni-strut type structural framing as required to wall mount the UV chambers. See drawing P101W for location.
18. Vertical UV nits must be installed to allow clearance for UV lamp removal from top of each UV unit assembly.
19. Provide all wiring and cabling needed to connect Control Panels to UV assembly devices. Devices requiring electrical connections to panel: UV Sensor, Flow Meter, Solenoid Valve, UV Lamp electrical connection (top of UV Chamber), and Cooling Fan.
20. Refer to Drawing P101W and Schematic Detail on drawing P501; Provide "balancing" header for inlet and outlet sides of UV assemblies. Piped balancing header is required for even distribution of water flow into and out of the parallel UV Water Treatment Design.
21. Design basis unit size (UV-A, UV-B): 31" long x 4" diameter.

B. Design Equipment: VIQUA Model PRO20, 20 gpm, 1-1/4" NPT connections with 20 gpm integral flow restrictor on inlet chamber, 1-1/4" solenoid valve on outlet port, Preheat type germicidal lamps. VIQUA Controller Interface, UV Sensor, Flow Meter, Cooling Fan. VIQUA COMMcenter with Building Management System interface device.

**2.05 METERS AND GAUGES**

A. Pressure gauges shall be liquid filled, with 1/4 in. NPT stem mount, 2.5 in. dial face, stainless steel exterior, stainless steel intervals, 0 - 160 PSI range.

B. Water Meter: 2" Totalizing type Water Meter with digital readout.
   1. Manufacturer: Assured Automation Model G2-2" NPT inlet and outlet. Or equal equipment accepted.
   2. Install meter at entrance of raw water supply from well pump. Meter required per NYSDOH for recording gallons of water entering the UV Treatment Plant

## PART 3 - EXECUTION

### 3.01 EQUIPMENT AND SYSTEMS

A. Install equipment and systems in accordance with provisions of each applicable Section of these Specifications.

B. The system manufacturer shall provide startup supervision by a qualified technical representative.

C. The manufacturer shall warrant all equipment for the following: UV Chamber - ten (10) years, Electrical (controller) and Hardware Components - five (5) years, UV Lamps, Sleeves, and UV Sensors - one (1) year. All warranties from date of purchase.

D. Installing contractor: period of one (1) full year from the time of satisfactory equipment start-up.

E. The manufacturer shall supervise the installation of the equipment and verify that the equipment produces the quality and quantity of water specified.

### 3.02 TESTS

A. Test all system piping with inert gas (Nitrogen) at a pressure of 1.5 times the system operating pressure. The pressure shall remain constant without a drop in pressure for one (1) hour.

B. Entire piping system shall be cleaned, flushed, sterilized and rinsed with hydrogen peroxide prior to being put into service. Work shall be performed in accordance with the system manufacturer.

### 3.03 INSTALLATION OF PIPING

A. Install air release valve (as indicated on the drawings) at the high point of the piping system on the top floor to assure that the system can be completely vented.

B. Do not conceal piping until inspected by the Owner's Representative.

**END OF SECTION 22 67 00**

**SECTION 22 70 10**
**NATURAL GAS SYSTEMS**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 SUBMITTALS

A. Provide manufacturer's data sheets and installation instructions for all equipment and accessories in this section in accordance with Basic Mechanical/Electrical Requirements and Division 01.

### 1.03 QUALITY ASSURANCE

A. Follow all requirements, recommendations, and appendices to comply with the following publications, codes, standards, and listings:
   1. 2020 Fuel Gas Code of New York State.
   2. American Gas Association.
   3. Central Hudson Gas and Electric

B. Provide equipment and accessories that are listed and labeled by a nationally recognized testing laboratory.

### 1.04 GAS SERVICE

A. All new underground gas service piping from the street main to, and including, the gas meter will be installed by Central Hudson Gas.

B. The cost of this work shall be included in this Contractor's bid.

### 1.05 GAS PRESSURE

A. The maximum allowable gas pressure inside the building is 1/2 psi.

### 1.06 UNDERGROUND GAS PIPING

A. All underground gas piping located downstream of the gas meter shall be installed by a approved utility contractor in accordance with the gas company's requirements.

B. The cost of this work shall be included in this Contractor's bid.

## PART 2 - PRODUCTS

### 2.01 GAS PIPING

A. Piping Materials: Refer to Specification Section 221010, "Piping Systems and Accessories" and Section 221020, "Underground Piping And Accessories".

B. All exposed exterior and interior piping shall be primed and painted with one coat of alkyd primer and two coats of exterior acrylic latex gloss enamel. Color shall be as selected.

### 2.02 VALVES

A. Refer to Specification Section 220523, "Valves".

### 2.03 FLEXIBLE CONNECTORS

A. Stainless steel construction and in accordance with ANSI Z21.24.

### 2.04 LOCATOR TAPE

A. Yellow plastic tape, intended for direct-burial service, not less than 6 inch (152.4 mm). wide x 4 mils (0.1016 mm) thick with #10 AWG coated stranded copper wire tracer. Lettering on the tape shall state, "CAUTION: BURIED GAS LINE BELOW".

B. Manufacturers: Calpico, Griffolyn, Terra Tape or approved equivalent.

**2.05 TRANSITION RISERS (PE UNDERGROUND GAS PIPE TO STEEL PIPING ABOVE GROUND)**

**2.06 A. 2" ANODELESS, PREBENT GAS SERVICE RISER. QUANITY(2) TWO: AT GENERATOR, AT GAS METER ASSEMBLY.**

**PART 3 - EXECUTION**

**3.01 ARRANGEMENTS**

A. Make arrangements with Central Hudson Gas and Electric to provide the gas service and meter at the indicated location.

B. Contact the utility company for the cost of the service, its fees and required permits. Pay all costs and include within the base bid.

C. The service load is 2,400,000 Btuh. The pressure at the meter outlet shall be set at 7-11 inch (279.4 mm). wc. Natural gas fired emergency generator is specified as needing 7" – 11" wc for operation.

D. Coordinate all service requirements with the utility company.

E. Coordinate Emergency Generator gas connection location with Electric Contractor prior to installing gas service riser from gas meter to generator.

F. The contractor shall arrange for the plumbing inspector to inspect the gas piping and vent installations upon completion including underground and rough-ins, as well as installation of gas-fired appliances.

**3.02 GAS DISTRIBUTION SYSTEM**

A. Provide distribution system from gas meter outlet, including mains, risers, branches, drips, shut-offs and other required parts. Connect to equipment indicated or specified as requiring gas for their operation.

B. Provide shutoff valve at the meter outlet. Provide all parts and accessories needed to connect to meter.

C. Furnish sleeve and sealing element for above ground gas piping entry through outside wall. Make entry gas and watertight.

**3.03 PIPING INSTALLATION**

A. Install gas piping at a uniform slope of 1/4 inch (6.35 mm). in 15 feet (457.2 cm) to prevent traps. Horizontal lines shall slope upward to risers to the equipment.

B. Drips and Sediment Traps: Install drips at points where condensate may collect. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate would be subject to freezing. The sediment trap shall be installed in the gas supply line to gas fired equipment. The trap shall be a tee fitting having a threaded capped nipple installed vertically in the bottom most opening of the tee.

C. Make reductions in pipe sizes using eccentric reducer fittings installed with the level side down. Connect branch piping from top or side of horizontal piping.

D. Install unions in pipes 2 inch (50.8 mm). and smaller, adjacent to each valve, regulator and at final connection to each piece of equipment. Unions are not required on flanged devices.

E. Provide pressure regulator in supply to each gas fired appliance as required.

**3.04 WELDING**

A. Welding shall be performed in compliance with the welding procedure specifications prepared by the National Certified Pipe Welding Bureau. Welded pipe fabricated by certified welder. Contractor shall submit proof of current certification of each welder if requested by the Owner. Use full-length pipe where possible; minimum distance between welds, 18 inch (457.2 mm). on straight runs. Welds must be at least full thickness of pipe with inside smooth; remove cutting beads, slag and excess material at joints; chamfer ends. Minimum gap 1/8 inch (3.18 mm)., maximum 1/4 inch (6.35 mm). for butt welds. Overlaps on position and bench welds to be not less than 3/4 inch (19.05 mm). One internal pass and one external pass minimum required on

slip-on flanges. Do not apply heat to rectify distorted pipe due to concentrated welding; replace distorted pipe. Exercise caution to prevent heat related damage to plastic parts within the gas meter or regulators.

B. Welder qualifications: Welded piping fabricated by certified welder. Welder shall be certified under ASME or API Code III.

**3.05 CONNECTIONS**

A. Install gas piping next to gas-utilizing equipment and appliances for servicing and maintenance. Connect gas piping to gas-utilizing equipment and appliances with shutoff valves and unions. Make connections to equipment downstream of valves and unions with flexible connectors. Valves, unions and flexible connectors shall be same size as the gas supply piping to the equipment.

B. Install a gas valve upstream within 6 feet (182.88 cm) of each gas-utilizing appliance. Install a union connection downstream from the valve to permit removal of controls.

C. Sediment Traps: Install full size threaded tee fittings forming drips, as close as practical to gas appliance inlets. Cap or plug bottom outlet.

**3.06 UNDERGROUND PIPING INSTALLATION**

A. All underground piping shall be installed by a utility approved contractor in accordance with the gas company's requirements.

B. Qualification by the utility company is required for the individual making heat-fusion joints.

C. The service main shall be installed with a minimum 36 inch (914.4 mm). cover and shall in all cases conform to be requirements of the pipe manufacturer instructions.

**3.07 LOCATOR TAPE**

A. Install the locator tape with the gas main, which can be used to help determine the location of the gas piping at a future time. Locate directly over the buried gas line at a depth of 6 inch (152.4 mm). below finished grade.

B. Terminate tracer wire in cast iron boxes. Maximum spacing between boxes shall be 500 feet (15240 cm)

**3.08 GAS PIPING TESTS**

A. Test natural gas systems according to 2020 Fuel Gas Code of New York State and the local utility requirements unless otherwise noted:
   1. Test pressure shall be 15 psi (103.42 kPa) for one (1) hour for steel piping.
   2. Pressure testing of plastic piping shall be per utility's requirements.

B. Tests shall be witnessed by utility company. Make arrangements, provide all necessary items to complete testing and pay all costs.

C. All tests shall be performed prior to the connection of equipment. Regulator shall be isolated from test pressures. Soap test shall be conducted on all joints. Repair leaks and defects with new materials. Retest system until satisfactory results are obtained.

D. Verify correct pressure settings for pressure regulators.

E. Provide written certification that tests have been conducted and satisfactorily completed. Submit to Owner's Representative.

**3.09 GAS LINE PURGING**

A. At completion of pressure test, purge all natural gas systems according to 2020 Fuel Gas Code of New York State and the utility company requirements.

B. Provide three (3) days notice to utility company to have the meter unlocked for service and equipment start up. Make all arrangements and pay all fees as required by the Utility Company.

**END OF SECTION 22 70 10**

**SECTION 23 05 00**
**BASIC MECHANICAL REQUIREMENTS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

B. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.02 WORK INCLUDED

A. Provide all labor, tools, materials, accessories, parts, transportation, taxes, and related items, essential for installation of the work and necessary to make work, complete, and operational. Provide new equipment and material unless otherwise called for. References to codes, specifications and standards called for in the specification sections and on the drawings mean, the latest edition, amendment and revision of such referenced standard in effect on the date of these contract documents. All materials and equipment shall be installed in accordance with the manufacturer's recommendations.

### 1.03 LICENSING

A. The Contractor shall hold a license to perform the work as issued by the authority having jurisdiction.

B. [Plumbing contract work shall be performed by, or under, the direct supervision of a licensed master plumber.]

C. [Electrical contract work shall be performed by, or under, the direct supervision of a licensed electrician.]

### 1.04 PERMITS

A. Apply for and obtain all required permits and inspections, pay all fees and charges including all service charges. Provide certificate of approval from the Authorities Having Jurisdiction prior to request for final payment.

B. Provide electrical inspection certificate of approval from Middle Department Inspection Agency, Commonwealth Inspection Agency, or an Engineer approved Inspection Agency prior to request for final payment.

### 1.05 CODE COMPLIANCE

A. Provide work in compliance with the following Codes and Standards based on the current edition in effect at project location:
   1. Building, Code of New York State.
   2. Existing Building Code of New York State.
   3. Fire Code of New York State.
   4. Plumbing Code of New York State.
   5. Mechanical Code of New York State.
   6. Fuel Gas Code of New York State.
   7. Property Maintenance Code of New York State.
   8. Energy Conservation Code of New York State
   9. Accessible and Usable Buildings and Facilities, ICC A117.1.
   10. New York State Department of Labor Rules and Regulations.
   11. New York State Department of Health.
   12. National Electrical Code (NEC).
   13. Occupational Safety and Health Administration (OSHA).
   14. Local Codes and Ordinances.
   15. Life Safety Code, NFPA 101.
   16. City of [Albany] [Buffalo] [Ithaca] [Syracuse] Plumbing Department.

## 1.06 GLOSSARY

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| ACI | American Concrete Institute |
| AGA | American Gas Association |
| AGCA | Associated General Contractors of America, Inc. |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AFBMA | Anti-Friction Bearing Manufacturer's Association |
| AMCA | Air Moving and Conditioning Association, Inc. |
| ANSI | American National Standards Institute |
| ARI | Air Conditioning and Refrigeration Institute |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. |
| ASME | American Society of Mechanical Engineers |
| ASPE | American Society of Plumbing Engineers |
| ASTM | American Society for Testing Materials |
| AWSC | American Welding Society Code |
| AWWA | American Water Works Association |
| FM | Factory Mutual Insurance Company |
| IBR | Institute of Boiler & Radiation Manufacturers |
| IEEE | Institute of Electrical and Electronics Engineers |
| IRI | Industrial Risk Insurers |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturer's Association |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NYS/DEC | New York State Department of Environmental Conservation |
| SBI | Steel Boiler Institute |
| SMACNA | Sheet Metal and Air Conditioning Contractors National Association |
| UFPO | Underground Facilities Protective Organization |
| UL | Underwriter's Laboratories, Inc. |
| OSHA | Occupational Safety and Health Administration |
| XL - GAP | XL Global Asset Protection Services |

## 1.07 DEFINITIONS

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| Acceptance | Owner acceptance of the project from Contractor upon certification by Owner's Representative. |
| As Specified | Materials, equipment including the execution specified/shown in the contract documents. |
| Basis of Design | Equipment, materials, installation, etc. on which the design is based. (Refer to the article, Equipment Arrangements, and the article, Substitutions.) |
| Code Requirements | Minimum requirements. |
| Concealed | Work installed in pipe and duct shafts, chases or recesses, inside walls, above ceilings, in slabs or below grade. |
| Coordination Drawings | Show the relationship and integration of different construction elements and trades that require careful coordination during fabrication or installation, to fit in the space provided or to function as intended. |
| Delegated-Design Services | Performance and Design criteria for Contractor provided professional services. Where professional design services or certifications by a design professional are specifically required of a Contractor, by the Contract Documents. Provide products and systems with the specific design criteria indicated.<br><br>If criteria indicated is insufficient to perform services or certification required, |

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| | submit a written request for additional information to the Engineer.<br><br>Submit wet signed and sealed certification by the licensed design professional for each product and system specifically assigned to the Contractor to be designed or certified by a design professional.<br><br>Examples: structural maintenance ladders, stairs and platforms, pipe anchors, seismic compliant system, wind, structural supports for material equipment, sprinkler hydraulic calculations. |
| Equal, Equivalent, Equal To, Equivalent To, As Directed and As Required | Shall all be interpreted and should be taken to mean "to the satisfaction of the Engineer". |
| Exposed | Work not identified as concealed. |
| Extract | Carefully dismantle and store where directed by Owner's Representative and/or reinstall as indicated on drawings or as described in specifications. |
| Furnish | Purchase and deliver to job site, location as directed by the Owner's Representative. |
| Inspection | Visual observations by Owner's site Representative. |
| Install | Store at job site if required, proper placement within building construction including miscellaneous items needed to affect placement as required and protect during construction. Take responsibility to mount, connect, start-up and make fully functional. |
| Labeled | Refers to classification by a standards agency. |
| Manufacturers | Refer to the article, Equipment Arrangements, and the article, Substitutions. |
| Prime Professional | Architect or Engineer having a contract directly with the Owner for professional services. |
| Product Data | Illustrations, standard schedules, performance charts, instructions, brochures, wiring diagrams, finishes, or other information furnished by the Contractor to illustrate materials or equipment for some portion of the work. |
| Provide (Furnish and Install) | Contractor shall furnish all labor, materials, equipment and supplies necessary to install and place in operating condition, unless otherwise specifically stated. |
| Relocate | Disassemble, disconnect, and transport equipment to new locations, then clean, test, and install ready for use. |
| Remove | Dismantle and take away from premises without added cost to Owner, and dispose of in a legal manner. |
| Review and Reviewed | Should be taken to mean to be followed by "for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents". |
| Roughing | Pipe, duct, conduit, equipment layout and installation. |
| Samples | Physical full scale examples which illustrate materials, finishes, coatings, equipment or workmanship, and establishes standards by which work will be judged. |
| Satisfactory | As specified in contract documents. |
| Shop Drawings | Fabrication drawings, diagrams, schedules and other instruments, specifically prepared for the work by the Contractor or a Sub-contractor, manufacturer, supplier or distributor to illustrate some portion of the work. |
| Site Representative | Owner's Inspector or "Clerk of Works" at the work site. |
| Submittals Defined (Technical) | Any item required to be delivered to the Engineer for review as requirement of the Contract Documents. |

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| | The purpose of technical submittals is to demonstrate for those portions of the work for which a submittal is required, the manner in which the Contractor proposes to conform to the information given and design concepts expressed and required by the Contract Documents. |

**1.08 EXISTING CONDITIONS**

A. Contractor shall review all available record documents of existing construction or other existing conditions and hazardous material information. Owner does not guarantee that existing conditions are the same as those indicated in these documents. Contractor shall record existing conditions via measured drawings and preconstruction photographs or video. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage, removal or construction operations.

B. Owner will occupy portions of the building immediately adjacent to the area(s) of removals. Conduct removals so Owner's operations are not disrupted. Contractor shall locate, identify, disconnect and seal or cap mechanical, plumbing, fire protection and/or electrical systems serving areas of removals, unless noted otherwise in the contract documents. Contractor shall arrange shut-down of systems with the Owner. Piping and ductwork indicated to be removed shall be removed and capped or plugged with compatible materials. If services/systems are required to be removed, relocated or abandoned, provide temporary services/systems the bypass area(s) of removals to maintain continuity of services/systems to other parts of the building, as required.

**1.09 SHOP DRAWINGS/PRODUCT DATA/SAMPLES**

A. Provide submittals on all items of equipment and materials to be furnished and installed. Submittals shall be accompanied by a transmittal letter, stating name of project and contractor, name of vendor supplying equipment, number of drawings, titles, specification sections (name and number) and other pertinent data called for in individual sections. Submittals shall have individual cover sheets that shall be dated and contain: Name of project; name of prime professional; name of prime contractor; description or names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. Individual piecemeal or incomplete submittals will not be accepted. Similar items, (all types specified) shall be submitted at under one cover sheet per specification section (e.g. lighting fixtures, valves, plumbing fixtures, etc.). Submittals shall include all required documentation for each product listed in the specification section at the same time as a complete package. Number each submittal by trade. Indicate deviations from contract requirements on Letter of Transmittal. Submittals will be given a general review only. Corrections or comments made on the Submittals during the review do not relieve Contractor from compliance with requirements of the drawings and specifications. The Contractor is responsible for: confirming and correcting all quantities; checking electrical characteristics 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. If submitting hard copies, submit four (4) copies for review.

B. [The Engineer will review up to two (2) submissions of any single submittal. The Contractor will be invoiced on an hourly rate basis for the time spent reviewing the same shop drawing in excess of twice.]

C. If submittals are to be submitted electronically, all requirements in Item A apply. Submittals shall be emailed in PDF format to specific email address provided by the Construction Manager, General Contractor, Architect or Project Manager. Name of project shall be in subject line of email. Send emails to [mealbasubmittalclerk@meengineering.com]

D. Refer to Division 01 for additional requirements.

**[DESIGNER NOTE: VERIFY AND EDIT.]**

**2.01 [PROTECTION OF PERSONS AND PROPERTY**

A. Contractor shall assume responsibility for construction safety at all times and provide, as part of contract, all trench or building shoring, scaffolding, shielding, dust/fume protection, mechanical/electrical protection, special grounding, safety railings, barriers, and other safety feature required to provide safe conditions for all workmen and site visitors.]

**2.02 EQUIPMENT ARRANGEMENTS**

A. The contract documents are prepared using one manufacturer as the Basis of Design, even though other manufacturers' names are listed. If Contractor elects to use one of the listed manufacturers other than Basis of Design or if the physical size, performance or electrical characteristics for the Basis of Design equipment differs from what is indicated in the contract documents, submit detailed drawings, indicating proposed installation of equipment. Show maintenance clearances, service removal space required, and other pertinent revisions to the design arrangement. Make required changes in the work of other trades, at no increase in any contract. Provide larger motors, feeders, breakers, and equipment, additional control devices, valves, fittings and other miscellaneous equipment required for proper operation, and assume responsibility for proper location of roughing and connections by other trades. Remove and replace doorframes, access doors, walls, ceilings, or floors required to install. If revised arrangement submittal is rejected, revise and resubmit specified Basis of Design item which conforms to Contract Documents.

**2.03 SUBSTITUTIONS**

A. If Contractor desires to bid on any other kind, type, brand, or manufacture of material or equipment than those named in specifications, secure prior approval. To request such approval, Contractor shall submit complete information comparing (item-for-item) material or equipment offered with design material or equipment. Include sufficient information to permit quick and thorough comparison, and include performance curves on same basis, capacities, power requirements, controls, materials, metal gauges, finishes, dimensions, weights, etc., of major parts. If accepted, an addendum will be issued to this effect ahead of bid date. Unless such addendum is issued, substitution offered may not be used.

B. Refer to Division 01 for additional requirements.

**2.04 UTILITY COMPANY SERVICES**

A. Division 26 shall make arrangements with local utility company for electric service to the Owner's distribution equipment. Provide underground or overhead electric service as called for and transformers, meter sockets or meter compartments as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the electric service shall comply with the published Utility Company standards. [PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.]

B. Division 22 shall make arrangements with local utility company for gas service to the Owner's distribution system. Provide service to the building as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the gas service shall comply with the published Utility Company standards. [PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.]

**2.05 ROUGHING**

A. The Contract Drawings have been prepared in order to convey design intent and are diagrammatic only. Drawings shall not be interpreted to be fully coordinated for construction.

B. Due to small scale of Drawings, it is not possible to indicate all offsets, fittings, changes in elevation, interferences, etc. Make necessary changes in contract work, equipment locations, etc., as part of a contract to accommodate work to avoid obstacles and interferences encountered. Before installing, verify exact location and elevations at work site. DO NOT SCALE plans. If field conditions, details, changes in equipment or shop drawing information require an important rearrangement, report same to Owner's Representative for review. Obtain

written approval for all major changes before installing.

C. Install work so that items both existing and new are operable and serviceable. Eliminate interference with removal of coils, motors, filters, belt guards and/or operation of doors. Provide easy, safe, and code mandated clearances at controllers, motor starters, valve access, and other equipment requiring maintenance and operation. Provide new materials, including new piping and insulation for relocated work.

D. Coordinate work with other trades and determine exact route or location of each duct, pipe, conduit, etc., before fabrication and installation. Coordinate with Architectural Drawings. Obtain from Owner's Representative exact location of all equipment in finished areas, such as thermostat, fixture, and switch mounting heights, and equipment mounting heights. Coordinate all work with the architectural reflected ceiling plans and/or existing Architecture. Mechanical and electrical drawings show design arrangement only for diffusers, grilles, registers, air terminals, lighting fixtures, sprinklers, speakers, and other items. Do not rough-in contract work without reflected ceiling location plans.

E. Before roughing for equipment furnished by Owner or in other Divisions, obtain from Owner and other Divisions, approved roughing drawings giving exact location for each piece of equipment. Do not "rough in" services without final layout drawings approved for construction. Cooperate with other trades to insure proper location and size of connections to insure proper functioning of all systems and equipment. For equipment and connections provided in this contract, prepare roughing drawing as follows:
   1. Existing Equipment: Measure the existing equipment and prepare for installation in new location.
   2. New Equipment: Obtain equipment roughing drawings and dimensions, then prepare roughing-in-drawings. If such information is not available in time, obtain an acknowledgement in writing, then make space arrangements as required with Owner's Representative.

**2.06 COORDINATION DRAWINGS**

A. Before construction work commences, Divisions for all trades shall submit coordination drawings in the form of CAD drawing files, drawn at not less than 1/4 in. scale. Such drawings will be required throughout all areas, for all Contracts. These drawings shall show resolutions of trade conflicts in congested areas. Mechanical Equipment Rooms shall be drawn early in coordination drawing process simultaneous with all other congested areas. Prepare Coordination Drawings as follows:
   1. Division 23 shall prepare the base plan CAD coordination drawings showing all ductwork, all pertinent heating piping, and equipment. These drawings may be CAD files of the required Ductwork Shop Drawings. The drawings shall be coordinated with lighting fixtures, sprinklers, air diffusers, other ceiling mounted items, ceiling heights, structural work, maintenance clearances, electric code clearance, reflected ceiling plans, and other contract requirements. Reposition proposed locations of work after coordination drawing review by the Owner's Representative. Provide adjustments to exact size, location, and offsets of ducts, pipes, conduit, etc., to achieve reasonable appearance objectives. Provide these adjustments as part of contract. Minor revisions need not be redrawn.
   2. Division 23 shall provide CAD files and submit the base plan CAD Coordination Drawings to all Divisions.
   3. Divisions 21 and 22 shall draw the location of piping and equipment on the base plan CAD Coordination Drawings, indicating areas of conflict and suggested resolutions.
   4. Divisions 26, 27 and 28 shall draw the location of lighting fixtures, cable trays, and feeders over 1-1/2 in. on the base plan CAD Coordination Drawings, indicating areas of conflict and suggested resolution.
   5. The General Construction Trade shall indicate areas of architectural/structural conflicts or obstacles on the CAD Coordination Drawings, and coordinate to suit the overall construction schedule.

6. The General Construction Trade shall expedite all Coordination Drawing work and coordinate to suit the overall construction schedule. In the case of unresolved interferences, he shall notify the Owner's Representative. The Owner's Representative will then direct the various trades as to how to revise their drawings as required to eliminate installation interferences.
7. If a given trade proceeds prior to resolving conflicts, then if necessary, that trade shall change its work at no extra cost in order to permit others to proceed with a coordinated installation. Coordination approval will be given by areas after special site meetings involving all Divisions.

B. The purpose of the coordination drawing process is to identify and resolve potential conflicts between trades, and between trades and existing or new building construction, before they occur in construction. Coordination drawings are intended for the respective trade's use during construction and shall not replace any Shop Drawings, or record drawings required elsewhere in these contract documents.

**2.07 REMOVAL WORK**

A. Where existing equipment removals are called for, submit complete list to Owner's Representative. All items that Owner wishes to retain that do not contain asbestos or PCB material shall be delivered to location directed by Owner. Items that Owner does not wish to retain shall be removed from site and legally disposed of. Removal and disposal of material containing asbestos, lead paint, mercury and PCB's shall be in accordance with Federal, State and Local law requirements. Where equipment is called for to be relocated, contractor shall carefully remove, clean and recondition, then reinstall. Remove all abandoned piping, wiring, equipment, lighting, ductwork, tubing, supports, fixtures, etc. Visit each room, crawl spaces, and roofs to determine total Scope of Work. The disturbance or dislocation of asbestos-containing materials causes asbestos fibers to be released into the building's atmosphere, thereby creating a health hazard to workmen and building occupants. Consistent with Industrial Code Rule 56 and the content of recognized asbestos-control work, the Contractor shall apprise all of his workers, supervisory personnel, subcontractors, Owner and Consultants who will be at the job site of the seriousness of the hazard and of proper safeguards and work procedures which must be followed, as described in New York State Department of Labor Industrial Code Rule 56.

B. For materials indicated to contain lead, that are being affected by demolition or construction, the contractor shall comply with all Federal, State and Local law requirements regarding worker exposure to lead disturbance and abatement procedures.

C. Refer to the Owner's Lead Paint Survey. The Survey identifies the surfaces within the buildings that were tested for lead by collecting paint samples and performing laboratory analysis. If any unidentified surfaces are to be impacted the lead content shall be tested by analytical determinations conducted by a qualified laboratory approved by the Owner. The contractor shall review the current owner’s lead paint reports on file before starting any work which may disturb existing surfaces.

**2.08 REFRIGERANT RECOVERY**

A. Existing equipment to be removed, as shown on the plans may contain refrigerant and refrigerant oils. This refrigerant and refrigerant oil must be handled in accordance with Federal, State and Local law requirements.

B. Removal and recovery of refrigerant shall be in accordance with the current edition of Section 608 of the Clean Air Act of 1990, including all final regulations.

C. Refrigerant recovery must be performed by a technician, certified by an EPA-approved certification program, using refrigerant recovery and recycling equipment certified by an EPA-approved testing organization.

D. Owner "reserves the right of first refusal" on ownership of recovered refrigerant. Should Owner choose to maintain ownership of refrigerant, refrigerant shall be reclaimed, cleaned by this Contractor to ARI 700-1993 Standard of Purity, by an EPA certified refrigerant reclaimer.

Refrigerant shall be turned over to the Owner in suitable marked containers to be stored on site, at a place of the Owner's choosing.

## 2.09 EQUIPMENT AND MATERIAL REQUIREMENTS

A. Provide materials that meet the following minimum requirements:
   1. Materials shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, in accordance with NFPA 255.
   2. All equipment and material for which there is a listing service shall bear a UL label.
   3. Potable water systems and equipment shall be built according to AWWA Standards.
   4. Gas-fired equipment and system shall meet AGA Regulations and shall have AGA label.
   5. All electrical equipment and systems, as a whole, shall be tested and listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL) for the intended use in accordance with the applicable standards and have a physical label indicating such.
   6. Fire protection equipment shall be UL listed and FM approved.

B. Exterior and wet locations shall utilize materials, equipment supports, mounting, etc. suitable for the intended locations. Metals shall be stainless steel, galvanized or with baked enamel finish as a minimum. Finishes and coatings shall be continuous and any surface damaged or cut ends shall be field corrected in accordance with the manufacturer's recommendations.
   Hardware (screws, bolts, nuts, washers, supports, fasteners, etc.) shall be:
   1. Stainless steel where the associated system or equipment material is stainless steel or aluminum.
   2. Hot dipped galvanized or stainless steel where the associated system or equipment is steel, galvanized steel or other.

## 2.10 CUTTING AND PATCHING

A. Each trade shall include their required cutting and patching work unless shown as part of the General Construction Contract. Refer to General Conditions of the Contract for Construction, for additional requirements. Cut and drill from both sides of walls and/or floors to eliminate splaying. Patch cut or abandoned holes left by removals of equipment or fixtures. Patch adjacent existing work disturbed by installation of new work including insulation, walls and wall covering, ceiling and floor covering, other finished surfaces. Patch openings and damaged areas equal to existing surface finish. Cut openings in prefabricated construction units in accordance with manufacturer's instructions.

## 2.11 PAINTING

A. Paint all insulated and bare piping, pipe hangers and supports exposed to view in mechanical equipment rooms, penthouse, boiler rooms and similar spaces. Paint all bare piping, ductwork and supports exposed to the out-of-doors with rust inhibiting coatings. Paint all equipment that is not factory finish painted (i.e. expansion tanks, etc.).

B. All painting shall consist of one (1) prime coat and two (2) finish coats of non-lead oil base paint, unless otherwise indicated herein. Provide galvanized iron primer for all galvanized surfaces. All surfaces must be thoroughly cleaned before painting. Review system color coding prior to painting with the Owner's Representative or Architect.

C. All items installed after finished painting is completed and any damaged factory finish paint on equipment furnished under this contract must be touched up by the Contractor responsible for same.

D. Include painting for patchwork with color to match adjacent surfaces. Where color cannot be adequately matched, paint entire surface. Provide one (1) coat of primer and two (2) finish coats or as called for in the Specifications.

E. All primers and paint used in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

F. Refer to Division 9 - Finishes, for additional information.

## 2.12 [EXISTING CEILING REMOVAL AND RE-INSTALLATION

A. In a renovation project, any existing ceiling removal and re-installation work required for the completion of a Contractors or Subcontractors work, shall be removed and re-installed by that Contractor or Subcontractor. This applies in any areas not called for to have a new ceiling installed.

B. The ceiling removal and re-installation shall include lay-in ceiling tile and grid, to the extent necessary to accomplish the work. Removed ceiling tile and grid shall be safely stored during the course of the work, and it shall be re-installed to the original existing condition.

C. The ceiling removal and re-installation shall include gypsum board or plaster ceilings and the associated suspension systems. Removed ceiling areas shall be patched with materials to match the existing ceiling, and painted to match. If paint cannot be matched exactly, paint the entire ceiling a similar color.

## 2.13 CONCEALMENT

A. Conceal all contract work above ceilings and in walls, below slabs, and elsewhere throughout building. If concealment is impossible or impractical, notify Owner's Representative before starting that part of the work and install only after their review. In areas with no ceilings, install only after Owner's Representative reviews and comments on arrangement and appearance.

## 2.14 CHASES

A. New Construction:
   1. Certain chases, recesses, openings, shafts, and wall pockets will be provided as part of General Construction Trade. Mechanical and Electrical trades shall provide all other openings required for their contract work.
   2. Check Architectural and Structural Design and Shop Drawings to verify correct size and location for all openings, recesses and chases in general building construction work.
   3. Assume responsibility for correct and final location and size of such openings.
   4. Rectify improperly sized, improperly located or omitted chases or openings due to faulty or late information or failure to check final location.
   5. Provide 18 gauge galvanized sleeves and inserts. Extend all sleeves 2 in. above finished floor. Set sleeves and inserts in place ahead of new construction, securely fastened during concrete pouring. Correct, by drilling, omitted or improperly located sleeves. Assume responsibility for all work and equipment damaged during course of drilling. Firestop all unused sleeves.
   6. Provide angle iron frame where openings are required for contract work, unless provided by General Construction trade.

## 2.15 PENETRATION FIRESTOPPING

A. Refer to Division 07 for project-wide fire stopping information.

## 2.16 NON-RATED WALL PENETRATIONS

A. Each trade shall be responsible for sealing wall penetrations related to their installed work, including but not limited to ductwork, piping, conduits, etc. See individual specification sections for requirements.

## 2.17 SUPPORTS

A. Provide required supports, beams, angles, hangers, rods, bases, braces, and other items to properly support contract work. Modify studs, add studs, add framing, or otherwise reinforce studs in metal stud walls and partitions as required to suit contract work. If necessary, in stud walls, provide special supports from floor to structure above.

B. For precast panels/planks and metal decks, support mechanical/electrical work as determined by manufacturer and the Engineer. Provide heavy gauge steel mounting plates for mounting contract work. Mounting plates shall span two or more studs. Size, gauge, and strength of mounting plates shall be sufficient for equipment size, weight, and desired rigidity.

C. For finished areas without a finished ceiling system such as classrooms, offices, conference rooms, etc., where decking and structure is exposed, and ductwork/piping/conduit is exposed: All mounting brackets, channel support systems and mounting hardware for ductwork, piping, lighting, etc. shall be concealed and approved by the Architect/Engineer prior to the installation. AirCraft cable style hanging for ductwork is required. It is recommended that room mockups be done and receive Architect/Engineer approval prior to proceeding with installation.

D. Equipment, piping, conduit, raceway, etc. supports shall be installed to minimize the generation and transmission of vibration.

E. Materials and equipment shall be solely supported by the building structure and connected framing. Gypboard, ceilings, other finishes, etc. shall not be used for support of materials and equipment.

**2.18 APPLIED FIREPROOFING**

A. Scope: Provide encapsulation of surfaces where applied fireproofing materials have been disturbed, removed, or left missing by the removal of hangers or upper attachments, or when new hangers or upper attachment are installed.

B. Fire Resistance Rating: Fireproofing shall meet the original hourly rating when applied to the construction assembly where materials have been removed or disturbed, or is missing.

C. Fire Hazard Classification: Fireproofing shall be listed in the Underwriters Laboratories Building Materials Directory with the following performance properties:
   1. Flame Spread: 10 or less.
   2. Smoke Developed: 5 or less.

D. Product Data: Provide manufacturer's product descriptions for each required fireproofing material. Include application instructions, including primer/adhesive requirements and recommended minimum thickness and density for each required hourly rating.

E. Fire Proofing Manufacturer:
   1. Retro-Guard cementitious replacement fireproofing by Grace Construction Products, or equivalent Cafco Blaze Shield, and Cafco 300 by Isolatek.
   2. Physical Properties:
      a. Dry Field Density (ASTM E 605): 15 lb/cu ft minimum average.
      b. Cohesion/Adhesion (Bond Strength) (ASTM E 736): 200 lb/sq ft minimum average.
      c. Compressive Strength (ASTM E 761): 500 lb/sq ft minimum.
      d. Impact (Bond Impact) Resistance (ASTM E 760): Shall not crack or delaminate.
      e. Effect of Deflection (ASTM E 759): Shall not crack or delaminate.
      f. Corrosion Resistance (ASTM E 937): No evidence of corrosion.
      g. Air Erosion (ASTM E 859): Maximum 0.025 g/sq ft weight loss.
      h. Provide primer or adhesive recommended by the fireproofing manufacturer to obtain required bond strength for the specific fireproofing and substrate.

F. Apply fireproofing prior to installation of ductwork, piping, conduits, and other suspended items. Hangers, clips and other supports for these items shall be installed before application of fireproofing.

G. Examine the substrate and conditions under which fireproofing is to be applied. Do not proceed with the fireproofing work until unsatisfactory conditions have been corrected. Verify that hangers, clips, sleeves, and other items that will penetrate the fireproofing are in place. Check paint on substrate for compatibility with primer/fireproofing and adequacy of bond strength in accordance with fireproofing manufacturer's instructions.

H. Surface Preparation: Remove dirt, dust, oil, grease, loose paint and rust, mill scale, and other foreign matter that may impair the bonding of the fireproofing to the substrate. Clean substrate free of contamination from chemicals and solvents. Apply primer/adhesive where necessary to obtain bond strength of fireproofing to steel shop paint and where recommended by the fireproofing manufacturer.

I. Apply the fireproofing in accordance with UL fire test report and the manufacturer's application instructions. Thickness and density of fireproofing shall be in accordance with the approved product data and as required to produce the hourly fire resistance rating required.

## 2.19 ACCESS PANELS

A. Provide access panels for required access to respective trade's work. Location and size shall be the responsibility of each trade. Access panels provided for equipment shall provide an opening not smaller than 22 in. by 22 in. Panels shall be capable of opening a minimum of 90 degrees. Bear cost of construction changes necessary due to improper information or failure to provide proper information in ample time. Access panels over 324 square inches shall have two cam locks. Provide proper frame and door type for various wall or ceiling finishes. Access panels shall be equal to "Milcor" as manufactured by Inland Steel Products Co., Milwaukee, Wisconsin. Provide General Construction trade with a set of architectural plans with size and locations of access panels.

## 2.20 CONCRETE BASES

A. Provide concrete bases for all floor mounted equipment. Provide 3,000 lb. concrete, chamfer edges, trowel finish, and securely bond to floor by roughening slab and coating with cement grout. Bases 4 in. high (unless otherwise indicated); shape and size to accommodate equipment. Provide anchor bolts in equipment bases for all equipment provided for the project, whether mounted on new concrete bases or existing concrete bases.

## 2.21 HVAC EQUIPMENT CONNECTIONS

A. Contractor is responsible for draining, filling, venting, chemically treating and restarting any systems which are affected by work shown on the Contract Documents unless specifically noted otherwise.

B. Provide final condensate, hot water, glycol, chilled and condenser water, drain connections to all equipment as required by the equipment. Provide final connections, including domestic water piping, wiring, controls, and devices from equipment to outlets left by other trades. Provide equipment waste, drip, overflow and drain connections extended to floor drains.

C. Provide for Owner furnished and Contractor furnished equipment all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, insulation, sheet metal work, controls, dampers, as required.

## 2.22 PLUMBING EQUIPMENT CONNECTIONS

A. Contractor is responsible for draining, filling, venting, chemically treating and restarting any systems which are affected by work shown on the Contract Documents unless specifically noted otherwise.

B. Provide roughing and final water, waste, vent, gas, air connections to all equipment. Provide loose key stops, sanitary "P" traps, tailpiece, adapters, gas or air cocks, and all necessary piping and fittings from roughing point to equipment. Provide installation of sinks, faucets, traps, tailpiece furnished by others. Provide cold water line with gate valve and backflow prevention device at locations called for. Provide continuation of piping and connection to equipment that is furnished by others. Provide relief valve discharge piping from equipment relief valves.

C. Provide valved water outlet adjacent to equipment requiring same. Provide equipment type floor drains, or drain hubs, adjacent to equipment.

D. Install controls and devices furnished by others.

E. Refer to Contract Documents for roughing schedules, and equipment and lists indicating scope of connections required.

F. Provide for Owner furnished and Contractor furnished equipment all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, as required.

## 2.23 ELECTRICAL EQUIPMENT CONNECTIONS

A. Provide complete power connections to all electrical equipment. Provide control connections to equipment. Heavy duty NEC rated disconnect ahead of each piece of equipment. Ground all equipment in accordance with NEC.

B. Provide for Owner furnished and Contractor furnished equipment all power wiring, electric equipment, control wiring, switches, lights, receptacles, and connections as required.

## 2.24 STORAGE AND PROTECTION OF MATERIALS AND EQUIPMENT

A. Store Materials on dry base, at least 6 in. aboveground or floor. Store so as not to interfere with other work or obstruct access to buildings or facilities. Provide waterproof/windproof covering. Remove and provide special storage for items subject to moisture damage. Protect against theft or damage from any cause. Replace items stolen or damaged, at no cost to Owner.

B. [Refer to Division 01 for additional information.]

## 2.25 FREEZING AND WATER DAMAGE

A. Take all necessary precautions with equipment, systems and building to prevent damage due to freezing and/or water damage. Repair or replace, at no change in contract, any such damage to equipment, systems, and building. Perform first seasons winterizing in presence of Owner's operating staff.

## 2.26 OWNER INSTRUCTIONS

A. Before final acceptance of the work, furnish necessary skilled labor to operate all systems by seasons. Instruct designated person on proper operation, and care of systems/equipment. Repeat instructions, if necessary. Obtain written acknowledgement from person instructed prior to final payment. Contractor is fully responsible for system until final acceptance, even though operated by Owner's personnel, unless otherwise agreed in writing. List under clear plastic, operating, maintenance, and starting precautions procedures to be followed by Owner for operating systems and equipment.

## 2.27 OPERATION AND MAINTENANCE MANUALS

A. Submit by email (preferred) or digital media, thru the normal project submittal process. Include a copy of each final approved Shop Drawing, wiring diagrams, piping diagrams, spare parts lists, final testing and balancing report, as-built drawings and manufacturer's instructions. Include typewritten instructions, describing equipment, starting/operating procedures, emergency operating instructions, summer-winter changeover, freeze protection, precautions and recommended maintenance procedures. Include name, address, and telephone number of installing contractor and of supplier manufacturer Representative and service agency for all major equipment items. Provide a table of contents page and dividers based upon specification section numbers. Submit in a compiled and bookmarked PDF format as outlined below. Each item listed in the table of contents shall include a hyperlink to the associated section of the O&M Manual, in addition to the bookmarking.

B. Provide content for Operation and Maintenance Manuals as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Engineer will comment on whether content of operation and maintenance submittals is acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

C. Submit Operation and Maintenance Manuals in the following format:
   1. Submit by uploading to web-based project software site, or by email to Architect, as a formal project submittal in conformance with the project specific submittal procedures. Enable reviewer comments on draft submittals.

2. 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.
3. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in the 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.

D. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing Owner training. Engineer will comment on whether general scope and content of manual are acceptable.

E. Final Manual Submittal: Submit O&M manual in final form prior to requesting inspection for Substantial Completion and at least 2 weeks before commencing Owner training. Engineer will return copy with review comments.
1. Correct or revise O&M manual to comply with Engineer'scomments. Submit copies of each corrected manual within 2 weeks of receipt of Engineer's comments.

F. Refer to Division 01 for additional requirements.

**2.28 RECORD DRAWINGS**

A. The Contractor shall obtain at his expense one (1) set of construction Contract Drawings, (including non-reproduction black and white prints or electronic files) for the purpose of recording as-built conditions.

B. The Contractor shall perform all survey work required for the location and construction of the work and to record information necessary for completion of the record drawings. Record drawings shall show the actual location of the constructed facilities in the same manner as was shown on the bid drawings. All elevations and dimensions shown on the drawings shall be verified or corrected so as to provide a complete and accurate record of the facilities as constructed.

C. It shall be the responsibility of the Contractor to mark EACH sheet of the contract documents in red and to record thereon in a legible manner, any and all approved field changes and conditions as they occur. A complete file of approved field sketches, diagrams, and other changes shall also be maintained. At completion of the work, the complete set of red marked contract documents, plus all approved field sketches and diagrams shall be submitted to the engineer and used in preparation of the record drawings.

D. A complete set of red marked contract drawings shall be submitted, at one time, as the "Record" set. If there are no changes to a specific drawing, the contractor shall indicate "NO CHANGES" on that drawing. ALL drawings shall be included in the "Record" set.

E. The complete set of red marked Contract Documents or electronic files shall be certified by the Contractor as reflecting record conditions and submitted to the engineer for review.

F. The Contractor shall have the marked up set scanned, if they are not already electronic files, and then submit them to the Engineer as the "Record Set".

G. Refer to Division 01 for additional requirements.

**2.29 FINAL INSPECTION**

A. Upon completion of all Engineering Site Observation list items, the Contractor shall provide a copy of the Engineering Site Observation Report back to the Engineer with each items noted as completed or the current status of the item.

**2.30 COMMISSIONING**

A. Refer to General Commissioning Requirements in Division 01 for additional requirements.

## 2.31 TEMPORARY HEATING AND COOLING

A. Refer to the General Conditions of the Contract for Construction and Supplemental General Conditions.

## 2.32 TEMPORARY FACILITIES

A. Refer to the Division 01 Sections, General Conditions and Supplemental General Conditions.

## 2.33 TEMPORARY LIGHT AND POWER

A. Refer to the Division 01 Sections, General Conditions and Supplemental General Conditions.

## 2.34 CLEANING

A. It is the Contractor's responsibility to keep clean all equipment and fixtures provided under this contract for the duration of the project. Each trade shall keep the premises free from an accumulation of waste material or rubbish caused by his operations. The facilities require an environment of extreme cleanliness, and it is the Contractor's responsibility to adhere to the strict regulations regarding procedures on the existing premises. After all tests are made and installations completed satisfactorily:
   1. Thoroughly clean entire installation, both exposed surfaces and interiors.
   2. Remove all debris caused by work.
   3. Remove tools, surplus, materials, when work is finally accepted.

## 2.35 TRANSFER OF ELECTRONIC FILES

A. M/E Engineering, P.C. will provide electronic files for the Contractor's use in the preparation of sheet metal shop drawings, coordination drawings, or record drawings related to the project, subject to the following terms and conditions:
   1. The Contractor shall submit a formal request for electronic drawing files on the M/E Engineering, P.C. website, by utilizing the following website link: http://www.meengineering.com/contact-pages/contractor-request
   2. M/E Engineering, P.C. makes no representation as to the compatibility of these files with the Contractor's hardware or the Contractor's software beyond the specific release of the referenced specifications.
   3. M/E Engineering can only provide CAD files of M/E/P/FP drawing levels for which we are the Engineer of Record. CAD files of Architectural backgrounds, reflected ceiling plans, structural plans, etc. must be obtained separately from the Architect of Record.
   4. Data contained on these electronic files is part of M/E Engineering, P.C.'s instruments of service shall not be used by the Contractor or anyone else receiving data through or from the Contractor for any purpose other than as convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by the Contractor or by others will be at the Contractor's sole risk and without liability or legal exposure to M/E Engineering, P.C. The Contractor agrees to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against M/E Engineering, P.C., its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with the Contractor's use of the electronic files.
   5. Furthermore, the Contractor shall, to the fullest extent permitted by law, indemnify and hold harmless, M/E Engineering, P.C. from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from the Contractor's use of these electronic files.

6. These electronic files are not contract documents. Significant difference may arise between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. M/E Engineering, P.C. makes no representation regarding the accuracy or completeness of the electronic files the Contractor receives. In the event that a conflict arises between the signed contract documents prepared by M/E Engineering, P.C. and electronic files, the signed contract documents shall govern. The Contractor is responsible for determining if any conflicts exist. By the Contractor's use of these electronic files the Contractor is not relieved of the Contractor's duty to comply with the contract documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, field verify conditions and coordinate the Contractor's work with that of other contractors for the project.

**END OF SECTION 23 05 00**

**SECTION 23 05 04**
**ELECTRIC WIRING**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services for the complete installation of motor control wiring and temperature control wiring as required in Contract Documents. Provide wiring and conduit, required to connect devices furnished as part of or adjunctive to the automatic temperature control system and for motor control regardless of the source of supply. Control wiring includes 120 volt and lower voltage wiring for control signals directing equipment operation. Control circuits shall be 120 volt maximum. Provide wiring in accordance with requirements specified in Division 26, "Electrical" and the National Electrical Code. Provide devices required for proper system operation, including special electrical switches, transformers, disconnect switches, relays, and circuit breaker protection.

B. Coordinate all work with Division 26, "Electrical".

### 1.02 WORK NOT INCLUDED

A. Power wiring for motors, motor starters and associated starting and control equipment, as well as the motor starters (except in the case of equipment specified to have packaged control/starters), are included in Division 26, "Electrical", unless otherwise called for.

### 1.03 QUALIFICATIONS

A. Wiring shall be installed in compliance with all requirements of Division 26, "Electrical".

### 1.04 SUBMITTALS

A. Provide complete wiring diagrams for equipment systems. Deliver wiring diagrams to proper trades in time for roughing of conduit, equipment connections, and avoid delay in construction schedule. Wiring diagrams and roughing information to be wired as part of the Work of Division 26, "Electrical", shall be clearly indicated.

## PART 2 - PRODUCTS

### 2.01 PRODUCTS

A. Refer to Division 26 specifications for required wiring materials.

## PART 3 - EXECUTION

### 3.01 GENERAL

A. Check electrical wiring pertaining to equipment for completeness and correctness of connections. Correct any misapplied motor and/or motor starter, improper thermal overload device, or device which fails to function and resultant damage, whether due to incorrect connections or improper information on wiring diagrams.

### 3.02 WIRING FOR CONTROL SYSTEMS

A. Provide motor control and temperature control wiring for equipment. All wiring shall be in conduit, unless otherwise noted below, supported on 5ft. centers. Refer to Section 260501 for type of conduit to be used in specific applications.
   1. Provide 18 in. length flexible conduit at motors and devices subject to vibration.
   2. Do not attach directly to hot surfaces, piping, or ductwork.
   3. Control wiring shall be in separate conduit from all other wiring.
   4. Where allowable by Code and contract documents, temperature control wiring may be installed without conduit. Installation and wire insulation types shall be as described by NEC, Article 725. All low voltage wiring circuits 50 volt and under shall:
      a. Have the proper insulation and meet the requirements of NEC Article 300-22 when installed in plenums or other spaces used for environmental air.
      b. Be adequately supported using bridle rings spaced a maximum of 3 ft. on centers or other approved method when installed horizontally above accessible ceilings or run

exposed in unfinished areas.

c. Be run in wall cavity or surface metal raceway where no access is available to wall cavity, in finished areas.

d. Be installed in conduit when installed vertically in Mechanical/Utility Rooms from panels and devices up to above ceiling, or 10 ft. above finished floor if no ceiling, then run exposed.

e. Be installed in conduit in all cases not specifically covered by the above cases, or where subject to physical damage.

B. Provide pushbutton stations, pilot lights, selector switches, auxiliary starter contacts, and other devices required to provide specified functions.

1. Provide green grounding wire circuited from starter, and run ground wire through conduit to each remote auxiliary relay, pushbutton station, remote panel heating device, thermostat, or device with potentials in excess of 50 volts. Size ground wire as required by NEC.

**3.03 EQUIPMENT WIRING**

A. Provide power and control wiring between sections of electrical radiation units, between shipping splits, and between remote panels, thermostats, disconnect switches, and their respective units. Provide control wiring from the package control system, to each respective electric heat coil, reheat coil or motor. Properly mount control package. Power wiring to and including disconnect switch shall be by Division 26 "Electrical".

**3.04 FIELD WIRING IN STARTERS, CONTROLLERS AND PANELS**

A. Wiring within starters, controllers, and temperature control panels, shall be routed neatly in gutter space, away from moving and/or heat producing parts. Provide suitably rated terminal blocks. Do not place more than two wire connections on pilot device or relay terminal. Where more than two circuit connections are required, use terminal blocks. Provide nylon insulated, ring spade terminal for all control wires. Cables and wires shall be neatly bundled and lashed with nylon cable straps.

**END OF SECTION 23 05 04**

**SECTION 23 05 13**
**MOTORS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. NEMA MG 1 - Motors and Generators; 2021.

### 1.02 DESCRIPTION

A. Provide labor, materials, equipment and services as required for the complete installation designed in Contract Documents.

### 1.03 SUBMITTALS

A. Submit manufacturer's product data on all motors.

B. Product Data: For each motor, provide dimensions; mounting arrangements; frame type, enclosure type, location for conduit entries; shipping and operating weights; and manufacturer's technical data on features, performance, electrical ratings and characteristics.

C. Motor Performance Data: For each motor, include the following manufacturers' data:
   1. Motor Performance: Percent Efficiency, Power Factor, Torque, RPM, Duty Rating and Design Category.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Motor manufacturer shall be based and headquartered in the United States of America and shall design and manufacture motors in the United States.
   2. Motor manufacturer shall have over fifteen (15) years-experience in the motor industry and shall maintain active company-wide quality assurance program.
   3. Motor manufacturer shall maintain an authorized service center within 60 miles of the project site, capable of providing training, parts and emergency maintenance and repairs.

B. Motor performance shall be warranted against material and workmanship defects by manufacturer's limited warranty and service policy for the period of at least 18 months from the day of shipment from the factory or the manufacturer's warehouse.
   1. Premium efficiency motors shall be warranted for 36 months.
   2. Severe duty motors (as applicable) shall be warranted for 60 months.
   3. Extended warranty shall be offered for certain products or as agreed by additional terms and specified elsewhere.

## PART 2 - PRODUCTS

### 2.01 MOTORS

A. General Requirements:
   1. Motors built for 60 Hz operation, three phase for 1/2 HP and larger; single phase for 1/3 HP and smaller.
      a. In compliance with NEMA Standards, wound specifically for nameplate voltage, and selected for appropriate duty and environment.
      b. minimum service factor at rated voltage and frequency. 1.0 service factor for inverter duty motors.
      c. Bearings: Bearings shall have a rated fatigue life of L-10 (B-10) of 150,000 hours for direct-coupled applications and 50,000 hours for belted applications minimum. Belted rating shall be based on radial loads and pulley sizes called out in NEMA MG 1-14.43. The calculation will be determined from the pulley centerline being at the end of the motor shaft.
      d. V-belt connected motors with adjustable slide rail bases and pulleys.
      e. Motors shall have Class F insulation system, with Class B temperature rise, insulation meeting NEMA MG 1 Part 31. Maximum allowable motor temperature rise for open drip-proof (ODP) or totally enclosed fan cooled (TEFC) type at 1.15 service factor

shall be 105°C above 40°C ambient with a total temperature rating of 155°C.

f. NEMA locked rotor kVA code as required to match unit equipment torque characteristics.
g. Single-phase motors shall be capacitor start, induction run, or split phase type.
h. Polyphase motors shall be constant speed, squirrel cage, unless otherwise specified.
i. Nameplates shall have as a minimum, all information as described in NEMA Standard MG-1-20.60. Motor nameplate shall be mounted on enclosure with stainless steel fastening pins.

2. Motors for use with adjustable speed drive applications shall be premium efficiency inverter duty rated in accordance with NEMA and be capable of a 20:1 turndown.
   a. These motors shall meet NEMA corona inception voltage requirements, withstanding peak voltages up to 1600 volts, and be manufactured in accordance with NEMA MG 1 Part 30 and 31.
   b. All motors controlled by adjustable speed drives shall be equipped with circumferential micro-fiber shaft grounding rings to provide protection from electrical bearing damage, to meet NEMA MG 1, 31.4.4.3. Provide AEGIS Bearing Protection Ring Kit (or equal), installed in accordance with the manufacturer's recommendation. For motors controlled by adjustable speed drives and 50hp or greater the motor shall have a ceramic electrically insulating bearing assembly on the opposite end of the grounding brushes.
3. EC Motors:
   a. The motor shall be DC rated with permanent magnet rotor and automatically resetting integral overload protection.
   b. The unit shall meet the scheduled voltage, phase, control and other requirements indicated.
   c. Input Control: The unit shall have the following control features as a minimum:
      1) Packaged Unit controls: DDC input to include start/stop/status/general trouble.
      2) External Control: Minimum of Modbus and/or BACnet digital start/stop, digital trouble, 0-10VDC and 4-20mA speed control input.
   d. Unit insulation shall be Class H.
   e. Electrical termination lugs shall be suitable for the intended feed circuit.
   f. Ratings shall be 90% minimum power factor and 10% maximum total harmonic distortion.
   g. Speed control suitable for 100% to 10% operational capability.
   h. Fully programmable and reviewable settings and parameters.
   i. Suitable for operation at ambient conditions of 32 to 104 degrees F.
   j. The power circuiting shall be separated from the low voltage control circuiting.
   k. Output parameters where indicated:
      1) Speed.
      2) Trouble indication.
      3) Overload indication.
4. Three phase motors rated 1 HP and greater shall be copper winding, re-lubable ball bearings, 1.15 service factor (1.0 service factor for inverter duty motors), premium efficiency, energy-saver type with a guaranteed NEMA nominal full-load efficiency, by IEEE Standard 112 Test Method "B". Efficiency rating shall appear on nameplate, and shall be not less than as follows; per NEMA MG 1 Part 12, Table 12-12, nominal minimum efficiencies:

| MINIMUM NOMINAL FULL-LOAD MOTOR EFFICIENCY | | | | | | |
|---|---|---|---|---|---|---|
| HP | ODP MOTORS (RPM) | | | TEFC MOTORS (RPM) | | |
| | | | | | | |

| | 1200 | 1800 | 3600 | 1200 | 1800 | 3600 |
|---|---|---|---|---|---|---|
| 1.0 | 82.5 | 85.5 | 77.0 | 82.5 | 85.5 | 77.0 |
| 1.5 | 86.5 | 86.5 | 84.0 | 87.5 | 86.5 | 84.0 |
| 2.0 | 87.5 | 86.5 | 85.5 | 88.5 | 86.5 | 85.5 |
| 3.0 | 88.5 | 89.5 | 85.5 | 89.5 | 89.5 | 86.5 |
| 5.0 | 89.5 | 89.5 | 86.5 | 89.5 | 89.5 | 88.5 |
| 7.5 | 90.2 | 91.0 | 88.5 | 91.0 | 91.7 | 89.5 |
| 10 | 91.7 | 91.7 | 89.5 | 91.0 | 91.7 | 90.2 |
| 15 | 91.7 | 93.0 | 90.2 | 91.7 | 92.4 | 91.0 |
| 20 | 92.4 | 93.0 | 91.0 | 91.7 | 93.0 | 91.0 |

5. Nominal Motor Voltage Table:

| Nominal System Voltage | Motor Nameplate |
|---|---|
| 480V - 3 phase | 460 volt |
| 240V - 1 phase and 3 phase | 230 volt |
| 208V - 1 phase and 3 phase | 200 volt |
| 120V - 1 phase | 115 volt |

6. Motor Application; Provide the following enclosure types unless noted otherwise:

| Environment/Location | Motor Enclosure Type |
|---|---|
| General Purpose | Open drip-proof, TEFC with cast iron frame, or encapsulated |
| Outdoors, below grade or high humidity | TEFC with cast iron frame |
| Hazardous | Explosion-proof |
| Packaged Refrigeration Compressors | Hermetic or semi-hermetic |

7. Acceptable Manufacturers: Motors need not all be of the same manufacturer. Subject to the requirements of this section provide products by the following:
   a. General Electric Energy & Saver NEMA Premium Efficiency/(ODP); General Electric X$D Ultra NEMA Premium Efficiency (TEFC).
   b. Century/A.O. Smith Speed Plus
   c. Baldor-Reliance Super E.
   d. Lincoln Ultimate E CTAC.
   e. Marathon XRI.
   f. Siemens GO100A.
   g. Nidec Motor Co. (U.S. Motors) Premium Efficient.

**PART 3 - EXECUTION**

**3.01 MOTORS**

A. Furnished by equipment manufacturer and especially manufactured and/or selected, mounted, and installed for intended use. Install motors accessible for maintenance and belt adjustment.

**END OF SECTION 23 05 13**

**SECTION 23 05 14**
**MOTOR CONTROLLERS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. IEC 61800-3 - Adjustable Speed Electrical Power Drive Systems - Part3: EMC Requirements and Specific Test Methods for PDS and Machine Tools; 2022.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

D. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices; 2017.

E. NEMA ICS 7 - Industrial Control and Systems: Adjustable-Speed Drives; 2020.

F. 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.

G. NEMA MG 1 - Motors and Generators; 2021.

H. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.

I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. UL 508 - Industrial Control Equipment; Current Edition, Including All Revisions.

K. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

### 1.02 DESCRIPTION

A. Provide labor, materials, equipment and services as required for the complete installation and full operation of separately enclosed, preassembled, motor controls, rated 600V and less.

### 1.03 DEFINITIONS

A. ASD: Adjustable speed drive motor controller.

B. CPT: Control power transformer.

C. DDC: Direct digital control. Building management/control system.

D. EMI: Electromagnetic interference.

E. PWM: Pulse width modulated.

F. RFI: Radio-frequency interference.

### 1.04 SUBMITTALS

A. Submit manufacturer's product data for each type and rating of motor controller indicated.
   1. Include dimensions, weights, enclosure types, rating capacities, operating characteristics, electrical characteristics, furnished specialties and accessories, mounting and attachment details, method of field assembly, components, and location / size of each field connection.
   2. Include diagrams for power, signal, and control wiring.

B. As part of Operation and Maintenance Data, provide manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor control modules, setting field-adjustable timers, controls, and status and alarm points, and setting field-adjustable overload relays.

### 1.05 QUALITY ASSURANCE

A. All methods of construction, details of workmanship, that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the

acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc., correspond to the nomenclature dictated by those manufacturers. Where "or equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

1. All equipment shall be tested at the factory. Unless specified elsewhere, standard factory inspection and operational tests will be acceptable.

B. Installation shall be in accordance with the manufacturer's recommendations, NFPA-70 (National Electrical Code), National Electrical Safety Code (NESC), state codes, local codes, and requirements of authority having jurisdiction.

C. Equipment shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of applicable published ANSI, NEMA, UL and IEEE Standards.

D. Equipment and systems shall be NRTL tested and labeled.

**1.06 WARRANTY**

A. Provide full system warranty (labor, travel, equipment, etc.) in accordance with Division 1 with a minimum of one (1) year from acceptance.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

A. Acceptable manufacturers include:

B. Adjustable Speed Drives (ASDs):
1. ABB (Design Make - ACH580)
2. Yaskawa
3. Square D
4. Allen-Bradley
5. Eaton Corporation
6. Emerson

C. Manual and Magnetic Motor Controllers:
1. Square-D
2. Cutler Hammer
3. General Electric
4. Allen-Bradley
5. Siemens

**2.02 ADJUSTABLE SPEED DRIVE MOTOR CONTROLLER**

A. General Requirements for ASDs:
1. ASD Description: adjustable speed drive, consisting of power converter that employs pulse-width-modulated inverter, factory built and tested in an enclosure, with integral disconnecting means and overcurrent and overload protection; arranged to provide self-protection, motor protection, and variable-speed control of one or more induction motors by adjusting output voltage and frequency. Comply with NEMA ICS 7, NEMA ICS 61800-2, and UL 508. Suitable for operation of NEMA MG 1, Design A and Design B motors, as defined by NEMA MG 1.

B. Unit Operating Requirements:
1. ASD shall provide full rated output from a line voltage of plus 10% and minus 10% of nominal voltage. ASD shall continue to operate without faulting from a +30% to -35% of nominal line voltage.
2. Input AC Voltage Unbalance: Not exceeding 5 percent.
3. Input Frequency Tolerance: Plus or minus 5 percent of ASD frequency rating.
4. Minimum Efficiency: 98 percent at 60 Hz, full load.
5. Minimum Primary-Side Power Factor: 98 percent under any load or speed condition.
6. Minimum Short-Circuit Current (Withstand) Rating: 100kA.

7. Ambient Operating Temperature Rating: 5 deg F (-15 deg C) to 104 deg F (40 deg C) minimum.
8. Humidity Rating: To 95 percent (noncondensing) minimum.
9. Altitude Rating: Suitable for intended location with 3300 feet minimum.
10. Vibration Withstand: Comply with NEMA ICS 61800-2.
11. Overload Capability: 1.1 times the base load current for 60 seconds; minimum of 1.3 times the base load current for two seconds.
12. Starting Torque: Minimum 140 percent of rated torque from 3 to 60 Hz.
13. Output Carrier Frequency: Selectable; 1 to 12.5 kHz.
14. Stop Modes: Programmable including fast, free-wheel, and dc injection braking.

C. Inverter: ASD shall employ a 6 PWM power electronic system, consisting of:
1. Input Section:
   a. ASD input power stage shall convert three-phase AC line power into a fixed DC voltage via a solid state full wave diode rectifier.
2. Intermediate Section:
   a. DC bus as a supply to the ASD output Section shall maintain a fixed voltage with filtering and short circuit protection.
   b. DC bus shall be interfaced with the ASD diagnostic logic circuit, for continuous monitoring and protection of the power components.
3. Output Section:
   a. Insulated Gate Bipolar Transistors (IGBTs) shall convert DC bus voltage to variable frequency and voltage.
   b. The ASD shall employ pulse width modulated output technology to power the motor.

D. Isolated Control Interface: ASDs control input to follow remote-control signal (selectable 0-10VDC, 4-20mA, 0-20mA, and network) over a minimum 40:1 speed range with electrical signal.

E. Internal Adjustability Capabilities:
1. Minimum Speed: 5 to 25 percent of maximum rpm.
2. Maximum Speed: 80 to 100 percent of maximum rpm.
3. Acceleration: 0.1 to 6000 seconds.
4. Deceleration: 0.1 to 6000 seconds.
5. Current Limit: 30 to minimum of 150 percent of maximum rating.

F. Self-Protection and Reliability Features:
1. Surge Suppression: Factory installed as an integral part of the ASD, complying with UL 1449 SPD, Type 1 or Type 2.
2. Loss of Input Signal Protection: Selectable response strategy, including speed default to a percent of the most recent speed, a preset speed, or stop; with alarm.
3. Under and overvoltage protection.
4. Inverter overcurrent protection.
5. ASD and Motor-Overload/Over temperature Protection: Microprocessor-based thermal protection system for monitoring ASDs and motor thermal characteristics, and for providing ASD over temperature and motor-overload alarm and trip. The settings shall be selectable utilizing the keypad.
6. Critical frequency rejection, with three selectable, adjustable dead bands.
7. Instantaneous line-to-line and line-to-ground overcurrent trips.
8. Loss-of-phase protection.
9. Reverse-phase protection.
10. Short-circuit protection.
11. Motor over-temperature fault.
12. Shut down on indication of motor local disconnect switch open position.

G. Automatic Reset/Restart: Attempt three restarts after drive fault or on return of power after an interruption and before shutting down for manual reset or fault correction; adjustable delay time

between restart attempts. Field adjustable for manual restart.

H. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped, unless "Bidirectional Autospeed Search" feature is available and engaged.

I. Bidirectional Autospeed Search: Capable of starting ASD into rotating loads spinning in either direction and returning motor to set speed in proper direction, without causing damage to drive, motor, or load.

J. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.

K. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.

L. Integral Input Disconnecting Means: magnetic circuit breaker with pad-lockable, door-mounted handle mechanism.

M. The ASD shall include a motor flux optimization circuit that will automatically reduce applied motor voltage to the motor to optimize energy consumption and reduce audible motor noise.

N. The ASD shall provide a programmable loss-of-load (broken belt / broken coupling) Form-C relay output. The drive shall be programmable to signal the loss-of-load condition via keypad warning, Form-C relay output, or over serial communication bus.

O. Unit Mounted Operator Station: front-accessible, sealed keypad and plain-English-language digital display; allows complete programming, program copying, operating, monitoring, and diagnostic capability.
   1. Keypad: In addition to required programming and control keys, include keys for HAND, OFF, and AUTO modes.
   2. Security Access: Provide electronic security access to controls through identification and password with at least three levels of access: View only; view and operate; and view, operate, and service. Coordinate the access codes with the Owner.

P. Status indicators displaying the following conditions:
   1. Power on.
   2. Run.
   3. Overvoltage.
   4. Line fault.
   5. Overcurrent.
   6. External fault.

Q. Historical Logging Information and Displays
   1. Real time clock with current time and date.
   2. Running log of total power versus time
   3. Total run time.
   4. Fault log, maintaining faults with time and date stamp for each.
   5. kWh.

R. Indicating Devices: Digital display mounted flush in ASD door and connected to display ASD parameters including, but not limited to:
   1. Output frequency (Hz).
   2. Motor speed (rpm).
   3. Motor status (running, stop, fault).
   4. Motor current (amperes).
   5. Motor torque (percent).
   6. Fault or alarming status (code).
   7. PID feedback signal (percent).
   8. DC-link voltage (V dc).

9. Set point frequency (Hz).
10. Motor output voltage (V ac).

S. Control Signal Interfaces:
   1. Electric Input Signal Interface:
      a. A minimum of two programmable analog inputs field selectable for 0- to 10-V dc or 4- to 20-mA dc.
      b. A minimum of six multifunction programmable digital inputs.
   2. Remote Signal Inputs: Capability to accept any of the following speed-setting input signals from the DDC system for HVAC or other control systems:
      a. 0- to 10-V dc.
      b. 4- to 20-mA dc.
      c. Potentiometer using up/down digital inputs.
      d. Fixed frequencies using digital inputs.
   3. Output Signal Interface: A minimum of one programmable analog output signal (0- to 10-V dc or 4- to 20-mA dc), which can be configured for any of the following:
      a. Output frequency (Hz).
      b. Output current (load).
      c. DC-link voltage (V dc).
      d. Motor torque (percent).
      e. Motor speed (rpm).
      f. Set point frequency (Hz).
      g. Any aux contacts.
   4. Remote Indication Interface: A minimum of three programmable dry-circuit relay outputs (120-VAC, 1 A) for remote indication of the following:
      a. Motor running.
      b. Set point speed reached.
      c. Fault and warning indication (overtemperature or overcurrent).

T. Interface with DDC System for HVAC: Factory-installed hardware and software shall interface with DDC system for HVAC to monitor, control, display, and record data for use in processing reports. ASD settings shall be retained within ASD's nonvolatile memory.
   1. Provide EIA-485 port as standard. The standard protocols shall be BACnet MS/TP, Modbus RTU and N2. Provide additional ports for any other protocols that are utilized in the project.

U. Interface so ASD has indication of downstream disconnect switch(es) status (open-closed) and operates accordingly.

V. ASDs shall have an input inductive reactance either via 5% impedance AC line reactor or a pair of balanced DC chokes, one on the positive and one on the negative side of the DC bus, with an effective input impedance equivalent to a 5% AC line reactor. Any ASDs that do not meet this requirement must have a 5% AC line reactor added, with the reactor mounted in the same enclosure as the ASD.

W. EMI/RFI Filtering: Onboard filters shall allow ASD assembly to be CE marked; certify compliance with IEC 61800-3 for Category C2.

X. Accessories:
   1. General Requirements for Control-Circuit and Pilot Devices: NEMA ICS 5; factory installed in ASD enclosure cover unless otherwise indicated.
   2. Reversible NC/NO bypass contactor auxiliary contact(s).
   3. Control Relays: Auxiliary and adjustable solid-state time-delay relays.

## 2.03 MOTOR STARTERS

A. Provide motor starters as listed on the Electric Equipment and Control Schedule on the drawings.

B. Starters, contactors and controllers shall comply with NEMA standards having general purpose NEMA 1 or 1B enclosure unless otherwise called for. Provide explosion proof, weather resistant or watertight construction as required. Starters shall be minimum NEMA size 0 with overloads in each phase sized per NEC, motor full load amperage, service factor, and motor operating conditions.

C. Pad lock arrangements shall be provided to lock the disconnect device in the "off" position. Magnetic starters shall be provided with a control power transformer with 120V secondary and primary and secondary fusing and be sized to accept the loads imposed there on. Starters shall have LED type pilot lights. Each starter subject to electrical interlock and/or automatic control shall have necessary auxiliary contacts.

D. Auxiliary Devices: Provide pushbutton stations, pilot lights, devices, relays, transformers, selector switches, electric thermostats, auxiliary starter contacts as required for functions called for. Provide separate relay for each speed to operate electric dampers or other devices as required for multispeed motor circuit.

E. Manual Motor Starter:
   1. Provide all starters with thermal overload(s); and pilot light(s), and handle lock-out provisions. Gang starter with selector switch for multispeed applications. Provide single or 2-pole as required:
      a. 120 volt, single-pole, surface mounted: Square-D FG-5P and handle guard.
      b. 120 volt, single-pole, flush mounted: Square-D FS-1P and handle guard.

F. Manual Motor Starter - Speed Controller: Shall be similar to "Manual Motor Starter," above, except two-gang with motor speed control sized to handle motor indicated, with positive full on and full off bypass of speed control unit.

G. Manual Starter with Relay: Shall be similar to "Manual Motor Starter," above, except to include a two-gang box with relay sized for load indicated, and hand-off-automatic switch. Connect relay for 120V operation on load side of starter in "automatic" mode. Coordinate connection of Form C maintained contact for control with Mechanical Contractor.

H. Magnetic Starter: Shall be single-speed, across-the-line type rated in accordance with NEMA standards, sizes and horsepower ratings. Starters shall be mounted in NEMA 1 enclosures unless otherwise indicated. Magnetic starters shall be equipped with fused control power transformer for 120V control power and double break silver alloy contacts; all contacts shall be replaceable without removing starter or disconnecting power wiring. Starter shall have straight-through wiring. Coils shall be of molded construction and shall be replaceable from the front without removing starter. Overload relays shall be melting alloy type with replaceable control circuit module. Thermal units shall be of one-piece construction and interchangeable. Starter shall be inoperative if thermal unit is removed. Provide hand-off-auto selector switch and "run" pilot light in cover. Wire for maintained contact unless otherwise noted.

I. Combination Magnetic Starter: Shall be similar to "Magnetic Starter," above, except shall include fusible disconnect switch connected ahead of starter. The disconnect handle shall be in control of the disconnect device with the door open or closed. Disconnect handle shall be clearly marked as to whether the disconnect device is "on" or "off".

J. Combination Reduced Voltage Magnetic Starter: Shall be similar to "Combination Magnetic Starter," above, except autotransformer closed transition reduced voltage type with autotransformer protection by winding over-temperature device.

K. Packaged Control Unit: Shall be furnished and mounted by others, and connected by Electrical Contractor. Generally consists of one or more starters, disconnect switches and additional control devices prewired.

L. Contactor: Shall be similar to "Magnetic Starter", above, except without thermal overload units.

**2.04 ENCLOSURES**

A. Enclosures: NEMA 250, to comply with environmental conditions at installed location. Provide Type 1 for dry and clean indoor locations, Type 3R for outdoor locations, Type 4X stainless

steel for kitchen and wash-down areas, and Type 12 for areas subject to dust, falling dirt, and dripping non corrosive liquids.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine areas, surfaces, and substrates to receive motor controllers, with installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.

B. Examine motor controllers before installation. Reject motor controllers that are wet, moisture damaged, or mold damaged.

C. Examine roughing-in for conduit systems to verify actual locations of conduit connections before motor controller installation.

D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

A. Wall-Mounted ASDs: Install with tops at uniform height and with disconnect operating handles not higher than 79 inches above finished floor, unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not on walls, provide freestanding racks.

B. Wall-Mounted Manual and Magnetic Controllers: Install on walls with tops at uniform height, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks.

C. Floor-Mounting Controllers: Install ASDs on 4-inch nominal thickness concrete base.
   1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
   2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
   3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   4. Install anchor bolts to elevations required for proper attachment to supported equipment.

D. Roof-Mounting Controllers: Install ASD on roofs with tops at uniform height and with disconnect operating handles not higher than 79 inches above finished roof surface unless otherwise indicated, and by bolting units to curbs or mounting on freestanding, lightweight, structural-steel channels bolted to curbs. Seal roof penetrations after raceways are installed.

E. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

F. Install fuses, heaters in thermal-overload relays (based on actual nameplate full-load amperes) after motors are installed, and install, connect, and fuse thermal-protector monitoring relays furnished with motor-driven equipment.

G. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.

H. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

I. Setting of Overload Relays: Select and set overloads on the basis of full-load current rating as shown on motor nameplate. Adjust setting value for special motors as required by NFPA 70 for motors that are high-torque, high-efficiency, and so on.

J. Comply with NECA 1.

### 3.03 CONTROL WIRING INSTALLATION

A. Install wiring between ASDs and remote devices.

B. Bundle, train, and support wiring in enclosures.

C. Connect selector switches and other automatic-control devices where applicable.

D. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switches are in manual-control position.

E. Connect selector switches with control circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor-overload protectors.

### 3.04 IDENTIFICATION

A. Identify motor controllers, components, and control wiring. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs. Label each ASD with engraved nameplate. Label each enclosure-mounted control and pilot device. Identify all items as described in Section 260501

### 3.05 FIELD QUALITY CONTROL

A. Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Tests and Inspections for ASDs:
   1. Inspect ASDs, wiring, components, connections, and equipment installation.
   2. Test insulation resistance for each ASD element, component, connecting motor supply, feeder, and control circuits.
   3. Test continuity of each circuit.
   4. Verify that voltages at ASD locations are within 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify Owner's Representative before starting the motor(s).
   5. Test each motor for proper phase rotation.
   6. Perform tests according to the Inspection and Test Procedures for Adjustable Speed Drives stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
   8. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

C. Tests and Inspections for Manual and Magnetic Motor Controllers:
   1. Comply with the provisions of NFPA 70B, "Testing and Test Methods" Chapter.
   2. Visual and Mechanical Inspection:
      a. Compare equipment nameplate data with drawings and specifications.
      b. Inspect physical and mechanical condition, anchorage, alignment, and grounding, and that the controller is clean.
      c. Inspect contactors: Verify mechanical operation and contact gap, wipe, alignment, and pressure are according to manufacturer's published data.
      d. Motor-Running Protection: Verify overload element rating is correct for its application and if protection is provided by fuses, verify correct fuse rating.
      e. Inspect bolted electrical connections for high resistance using one of the two following methods:
         1) Use a low-resistance ohmmeter. Compare bolted connection resistance values with values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
         2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS Table

100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

f. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.

D. Motor controllers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies the ASD and describes results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.

**3.06 STARTUP SERVICE**

A. Engage a factory-authorized service representative to perform startup service. Complete installation and startup checks according to manufacturer's written instructions.

**3.07 ADJUSTING**

A. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.

B. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.

C. Adjust carrier frequency for optimal operation with load and conditions.

D. Adjust the trip settings of instantaneous-only circuit breakers and thermal-magnetic circuit breakers with adjustable, instantaneous trip elements. Initially adjust to 6 times the motor nameplate full-load amperes and attempt to start motors several times, allowing for motor cool-down between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed 8 times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Owner's Representative before increasing settings.

**3.08 DEMONSTRATION**

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, reprogram, and maintain motor controllers.

**END OF SECTION 23 05 14**

**SECTION 23 05 30**
**ROOF CURBS**

## PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Provide labor, materials, equipment and services as required for the complete installation of roof curbs as shown in Contract Documents.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 230550 - Wind Restraint for HVAC Systems.

### 1.03 SUBMITTALS

A. Typical detail and schedule for equipment. Details shall include cross-sectional view illustrating clearly the type of curb being submitted, i.e. double wall insulated, with or without cant.

## PART 2 - PRODUCTS

### 2.01 ROOF CURBS AND PIPE/DUCT/EQUIPMENT SUPPORTS

A. Basis of Design: Subject to compliance with requirements of this section, provide Roof Products and Systems Corp. (RPS) or comparable product by one of the following:
   1. RPI (Roof Products Inc.)
   2. ThyCurb
   3. Greenheck

B. Configuration: Coordinate curb type with roof deck construction and insulation thickness.
   1. Self-flashing without cant strip, with mounting flange (RPS Series 2A).
   2. Built-in cant and mounting flange (RPS Series 3A).
   3. Built-in raised cant and mounting flange (RPS Series 4A).

C. Provide wind restraint in accordance with specified requirements.

### 2.02 FAN CURBS/DUCT CURBS

A. Standard Curb:
   1. Double wall, 1-1/2 in. minimum thickness, fully insulated in the interior cavity with rigid insulation. Curb constructed of galvanized steel, 1-1/2 in. 3# density insulation with continuous welded corner seams and painted at all welds. 20 gauge up to 36 in., 18 gauge 38 to 72 in., 16 gauge over 72 in. in any dimension.
   2. Curb height shall be 18 in. high or as otherwise noted on the drawings.
   3. Provide curb with adhesive backed closed cell foam gasket on the top edge to make airtight seal between curb and ventilator, fan, or air handling unit.

B. Basis of Design: RPS - RC Roof Curbs.

### 2.03 EQUIPMENT SUPPORTS

A. Double wall, minimum 18 in. high. Constructed of 18 gauge galvanized steel with continuous welded corner seams and painted at all welds. Constructed of heavier gauge steel where standard rail cannot support unit weight. Provide with top cap counter flashing. Width to be 5-1/2 inches.

B. Basis of Design: RPS - Equipment Rail ER2.

### 2.04 PIPE SUPPORTS

A. Same construction as "Equipment Supports". Provide with full length galvanized steel bracket, U bolts and accessories as required to secure piping to the pipe support as detailed on Contract Drawings. All fasteners shall be stainless steel.

B. Basis of Design: RPS - Pipe Mounting Pedestal Model ER.

### 2.05 PIPE CURB ASSEMBLY - PIPE PORTAL

A. Fully insulated with rigid 1-1/2 in. 3# density insulation. Minimum 18 in. high. Constructed of 18 gauge galvanized steel with continuous welded corner seams and painted at all welds.

B. Acrylic coated ABS rib reinforced curb cover and integral counter flashing, size and number of pipe and conduit openings as required to suit job conditions.

C. EPDM protective rubber pipe boots and stainless steel clamps secured around each pipe individually. Curb provided with raised cant, flanged or recessed. Curb flange shall suit roof construction and type of insulation being applied.

D. Basis of Design: RPS - Pipe Portal Flashing System.

## PART 3 - EXECUTION

### 3.01 GENERAL

A. Installation shall be in accordance with manufacturer's written instructions and in accordance with [seismic and] wind restraint requirements.

B. Height as recommended by equipment manufacturer, not less than described in this specification. This Contractor shall be responsible for exact size, length, and location and shall set and secure each curb or support to the roof. Shim and level curb or support as required. Provide curb and supports for all roof-mounted equipment. All roof penetrations shall be made through an appropriate curb.

1. All roof mounted equipment including fans, air handling units, etc, shall be set on an equipment curb or support unless otherwise noted.

**END OF SECTION 23 05 30**

**SECTION 23 05 48**
**VIBRATION ISOLATION OF MECHANICAL SYSTEMS**

## PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Furnish and install vibration control devices, materials, and related items. Perform all work as shown on the Drawings and as specified herein to provide complete vibration isolation systems in proper working order.

### 1.02 RELATED SECTIONS

A. See Specification Section 230550 - Wind Restraint for Mechanical Systems.

### 1.03 MATERIAL AND EQUIPMENT

A. All vibration isolation mounts shall be supplied by one of the following approved manufacturers:
   1. M.I.
   2. K.N.C.
   3. VMC Group
   4. V.E.C.

### 1.04 QUALITY ASSURANCE

A. Coordinate the size, location and special requirements of vibration isolation equipment and systems with other trades. Coordinate plan dimensions with size of housekeeping pads.

B. Provide vibration isolators of the appropriate sizes, with the proper loading to meet the specified deflection requirements.

C. Supply and install any incidental materials such as mounting brackets, attachments and other accessories as may be needed to meet the requirements stated herein even if not expressly specified or shown on the Drawings, without claim for additional payment.

D. Verify correctness of equipment model numbers and conformance of each component with manufacturer's specification.

E. Should any rotating equipment cause excessive noise or vibration when properly installed on the specified isolators, the Contractor shall be responsible for re-balancing, realignment, or other remedial work required to reduce noise and vibration levels. Excessive is defined as exceeding the manufacturer's specifications for the unit in question.

F. Upon completion of work, the Architect or the Architect's Representative shall inspect the installation and shall inform the installing contractor of any further work that must be completed. Make all adjustments as directed by the Architect that result from the final inspection. This work shall be done before vibration isolation systems are accepted.

### 1.05 SUBMITTALS

A. Refer to related sections elsewhere for procedural instruction for submittals.

B. Before ordering any products, submit shop drawings of the items listed below. The shop drawings must be completed when submitted and must be presented in a clear, easily understood form. Incomplete or unclear presentation of shop drawings may be reason for rejection of the submittal.

C. A complete description of products to be supplied, including product data, dimensions, specifications, and installation instructions.

D. Detailed selection data for each vibration isolator supporting equipment, including:
   1. The equipment identification mark.
   2. The isolator type.
   3. The actual load.
   4. The static deflection expected under the actual load.
   5. The specified minimum static deflection.

6. Steel rails, steel base frames, and concrete inertia bases showing all steel work, reinforcing, vibration isolator mounting attachment method, and location of equipment attachment bolts.
7. Special details necessary to convey complete understanding of the work to be performed.

E. Submission of samples may be requested for each type of vibration isolation device. After approval, samples will be returned for installation at the job if requested. All costs associated with submission of samples shall be borne by the Contractor.

## PART 2 - PRODUCTS

### 2.01 VIBRATION ISOLATOR TYPES

A. General:
1. All springs installed out-of-doors shall be zinc electroplated or powder-coated after fabrication. Hardware and other metal parts shall be cadmium-plated or galvanized. Galvanizing shall meet ASTM Salt Spray Test Standards and Federal Test Standard No. 14.
2. All isolators installed out-of-doors shall have base plates with bolt holes for fastening the isolators to the support members.
3. Isolator types are scheduled to establish minimum standards. At the Contractor's option, labor-saving accessories can be an integral part of isolators supplied to provide initial lift of equipment to operating height, hold piping at fixed elevations during installation and initial system filling operations, and similar installation advantages. Accessories and seismic restraint features must not degrade the isolation performance of the isolators.
4. Static deflection of isolators shall be as provided in the EXECUTION section and as shown on the Drawings. All static deflections stated are the minimum acceptable deflection for the mounts under actual load. Isolators selected solely on the basis of rated deflections are not acceptable and will be disapproved.

B. Type NP (Neoprene Pad):
1. Neoprene pad isolators shall be one layer of 1/4 in. to 3/8 in. thick ribbed or waffled neoprene. The pads shall be sized so that they will be loaded within the manufacturer's recommended range.
2. Type NP isolators shall be one of the following products or approved equal:
   a. M.I.
   b. K.N.C.
   c. VMC Group

C. Type DNP (Double Neoprene Pad):
1. Neoprene pad isolators shall be formed by two layers of 1/4 in. to 3/8 in. thick ribbed or waffled neoprene, separated by a galvanized steel, stainless steel or aluminum plate. If the isolator is outdoors, the plate shall not be made of galvanized steel. These layers shall be permanently adhered together. The pads shall be sized so that they will be loaded within the manufacturer's recommended range.
2. Type DNP isolators shall be formed from one of the following products or approved equal:
   a. M.I.
   b. K.N.C.
   c. VMC Group

D. Type HSN (Hanger Spring and Neoprene):
1. Vibration isolator hangers shall consist of a free standing and laterally stable steel spring and a neoprene element in series, contained within a steel housing.
   a. Spring diameters and hanger housing lower hole size shall be large enough to permit the hanger rod to swing through a 30° arc before contacting the housing. Alternatively, other provisions shall be made to allow for a 30° arc of movement of the bottom hanger rod without contacting the isolator housing. Spring diameter shall not be less than 0.8 of the compressed height of the spring at the rated load. Spring elements shall have a minimum additional travel-to-solid equal to 50% of the rated

deflection. The neoprene element shall be designed to have a 0.3 in. minimum static deflection. The deflection of both the spring element and the neoprene element shall be included in determining the overall deflection of Type HSN isolators.

2. Type HSN isolators shall be one of the following products or approved equal:
   a. M.I.
   b. K.N.C.
   c. VMC Group

E. Type HN (Hanger Neoprene):
1. Vibration isolator hangers shall consist of a neoprene-in-shear element contained within a steel housing. A neoprene neck brushing shall be provided where the hanger rod passes through the hanger housing to prevent the rod from contacting the hanger housing. The diameter of the hole in the housing shall be sufficient to permit the hanger rod to swing through a 30° arc before contacting the hanger housing.
2. Type HN isolators shall be one of the following products or approved equal:
   a. M.I.
   b. K.N.C.
   c. VMC Group

## 2.02 RESILIENT PENETRATION SLEEVE/SEAL

A. Resilient penetration sleeve/seals shall be field-fabricated from a pipe or sheet metal section that is 1/2 in. to 3/4 in. larger than the penetrating element in all directions around the element, and shall be used to provide a sleeve through the construction penetrated. The sleeve shall extend 1 in. beyond the penetrated construction on each side. The space between the sleeve and the penetrating element shall be packed with glass fiber or mineral wool to within 1/4 in. of the ends of the sleeve. The remaining 1/4 in. space on each end shall be filled with acoustical sealant to form an airtight seal. The penetrating element shall be able to pass through the sleeve without contacting the sleeve. Refer to details on Drawings.

## 2.03 RESILIENT LATERAL SUPPORTS

A. These units shall either be a standard product of the vibration isolation mounting manufacturer, or be custom fabricated from standard components. These units shall incorporate neoprene isolation elements similar to Type FN that are specifically designed to provide resilient lateral bracing of ducts or pipe.

B. Resilient lateral supports shall be one of the following products or approved equal:
1. M.I.
2. K.N.C.
3. VMC Group

## 2.04 FLEXIBLE DUCT CONNECTIONS

A. Flexible duct connections shall be heavy glass fabric, double neoprene coated, approximately 30 oz. per sq. yd. The clear space between connected parts shall be a minimum of 3 in. and the connection shall have a minimum of 1.5 in. of slack material. Materials for flex connection shall be fire retardant, water and milder resistant, and comply with UL standard 214.

B. Flexible duct connections shall be one of the following products or approved equal:
1. Ventfabrics, Inc. "Ventglass".

## 2.05 THRUST RESTRAINTS

A. Thrust restraints shall consist of a spring element in series with a neoprene pad. The unit shall be designed to have the same deflection due to thrust-generated loads as specified for the isolators supporting the equipment. The spring element shall be contained within a steel frame and be designed so it can be pre-compressed at the factory to allow for a maximum of 1/4 in. movement during starting or stopping of the equipment. Allowable movement shall be field-adjustable. The assembly shall be furnished complete with rods and angle brackets for attachment to both equipment and the adjacent fixed structural anchor. The thrust restraints shall be installed on the discharge of the fan so that the restraint rods are in tension.

Assemblies that place the rods in compression are not acceptable. The holes in the spring restraint brackets through which the restraint rods pass must be oversized to prevent contact between the brackets and rods.

B. Thrust restraints shall be one of the following products or an approved equal:
   1. M.I.
   2. K.N.C.
   3. VMC Group

**2.06 GROMMETS**

A. Grommets shall be specially formed to prevent bolts from directly contacting the isolator base plate, and shall be sized so that they will be loaded within the manufacturer's recommended load range.

B. Grommets shall either be custom made by combining a neoprene washer and sleeve, or be one of the following products or an approved equal:
   1. MBIS, Inc. (Bedford Heights, OH)
   2. Barry Controls (Brighton, MA)
   3. Mason Industries Inc., (Hauppauge, NY)

**2.07 ACOUSTICAL SEALANT**

A. Sealants for acoustical purposes as described in this specification shall be silicone or one of the non-setting sealants indicated below:
   1. D.A.P.
   2. Pecora
   3. Tremco
   4. U.S.G.

**PART 3 - EXECUTION**

**3.01 APPLICATION**

A. General:
   1. Refer to the PRODUCTS section of this specification for vibration isolation devices identified on the Drawings or specified herein.
   2. The static deflection of all isolators specified herein are the minimum acceptable deflections for the mounts under actual load. Isolators selected solely on the basis of rated deflection are not acceptable and will be disapproved.

B. Major Equipment:
   1. Unless otherwise shown or specified on Drawings, all floor-mounted major equipment shall be set on 6 in. high concrete housekeeping pads.
   2. Types and minimum static deflections of vibration isolation devices for major equipment items shall be as specified hereunder.
   3. Flexible duct connections shall be installed at all fan unit intakes, fan unit discharges, and wherever else shown on the Drawings.
   4. Electrical connections to vibration-isolated equipment shall be flexible, as called for in the electrical portion of the specification.
   5. Thrust restraints shall be installed on all suspended fans and on all floor-mounted fans developing 4 in. or more of static pressure, unless the horizontal component of the thrust force can be demonstrated to be less than 10% of the equipment weight.

C. Equipment Vibration Isolation Schedule:

| TYPE | VIBRATION ISOLATOR TYPE | MINIMUM STATIC DEFLECTION (In.) | EQUIPMENT BASE |
|---|---|---|---|
| Condensing Unit | NP | .75 | ---- |
| Rooftop Air Handling Units | FN | .75 | --- |

| | | | |
|---|---|---|---|
| Inline Fans | HSN | 1.5 | ---- |

D. Miscellaneous Mechanical Equipment:
   1. Miscellaneous pieces of mechanical equipment such as converters, pressure reducing stations, dryers, strainers, storage tanks, condensate receiver tanks and expansion tanks which are connected to isolated piping systems shall be vibration-isolated from the building structure by Type NP or Type HN isolators (selected for .01 in. static deflection) unless their position in the piping system requires a higher degree of isolation as called for under "Pipe Isolation".

E. Pipes:
   1. All chilled water, condenser water, hot water, steam main and engine exhaust piping shall be isolated from the building structure within the following limits:
      a. Within mechanical rooms.
      b. Within 50 ft. total pipe length of connected vibration-isolated equipment (chillers, pumps, air handling units, pressure reducing stations, etc.).
      c. Piping shall be isolated from the building structure by means of vibration isolators, resilient lateral supports, and resilient penetration sleeve/seals.
      d. Isolators for the first three support points adjacent to connected equipment shall achieve one half the specified static deflection of the isolators supporting the connected equipment. When the required static deflection of these isolators is greater than 1/2 in., Type FSN or Type HSN isolators shall be used. When the required static deflection is less than or equal to 1/2 in., Type FN or Type HN isolators shall be used. All other pipe support isolators within the specified limits shall be either Type FN or Type HN achieving at least 1/4 in. static deflection.
      e. Where lateral support of pipes is required within the specified limits, this shall be accomplished by use of resilient lateral supports.
      f. Pipes penetrating the building construction shall be isolated from the building structure by use of resilient penetration sleeve/seals.

**3.02 INSTALLATION OF VIBRATION ISOLATION EQUIPMENT**

A. General:
   1. Locations of all vibration isolation devices shall be selected for ease of inspection and adjustment as well as for proper operation.
   2. Installation of vibration isolation equipment shall be in accordance with the manufacturer's instructions.

B. Isolators:
   1. All vibration isolators shall be aligned squarely above or below mounting points of the supported equipment.
   2. Isolators for equipment with bases shall be located on the sides of the bases which are parallel to the equipment shaft unless this is not possible because of physical constraints.
   3. Locate isolators to provide stable support for equipment, without excess rocking. Consideration shall be given to the location of the center of gravity of the system and the location and spacing of the isolators. If necessary, a base with suitable footprint shall be provided to maintain stability of supported equipment, whether or not such a base is specifically called for herein.
   4. If a housekeeping pad is provided, the isolators shall bear on the housekeeping pad and the isolator base plates shall rest entirely on the pad.
   5. Hanger rods for vibration-isolated support shall be connected to structural beams or joists, not the floor slab between beams and joists. Provide suitable intermediate support members as necessary.
   6. Vibration isolation hanger elements shall be positioned as high as possible in the hanger rod assembly, but not in contact with the building structure, and so that the hanger housing may rotate a full 360□ about the rod axis without contacting any object.
   7. Parallel running pipes may be hung together on a trapeze, that is isolated from the building. Isolator deflections must be the greatest required by the provisions for pipe

isolation for any single pipe on the trapeze. Do not mix isolated and un-isolated pipes on the same trapeze.

8. Pipes, ducts and equipment shall not be supported from other pipes, ducts and equipment.
9. Resiliently isolated pipes, ducts and equipment shall not come in rigid contact with the building construction or rigidly supported equipment.
10. The installed and operating heights of equipment vibration-isolated with Type FSNTL isolators shall be identical. Limit stops shall be out of contact during normal operation. Adjust isolators to provide 1/4 in. clearance between the limit stop brackets and the isolator top plate, and between the travel limit nuts and travel limit brackets.
11. Adjust all leveling bolts and hanger rod bolts so that the isolated equipment is level and in proper alignment with connecting ducts or pipes.

C. Flexible Duct Connections:
   1. Sheet metal ducts and plenum openings shall be squarely aligned with the fan discharge, fan intake, or adjacent duct section prior to installation of the flexible connection, so that the clear length is approximately equal all the way around the perimeter. Flexible duct connections shall not be installed until this provision is met. There shall be no metal-to-metal contact between connected sections, and the fabric shall not be stretched taut.

D. Thrust Restraints:
   1. Thrust restraints shall be attached on each side of the fan at the vertical centerline of thrust. The two rods of the thrust restraints shall be parallel to the thrust force. This may require custom brackets or standoffs. The body of the thrust restraint shall not come in contact with the connected elements. Thrust restraints shall be adjusted to constrain equipment movement to the specified limit.

E. Grommets:
   1. Where grommets are required at hold down bolts of isolators, bolt holes shall be properly sized to allow for grommets. The hold down bolt assembly shall include washers to distribute load evenly over the grommets. Bolts and washers shall be galvanized.

F. Resilient Penetration Sleeve/Seals:
   1. Maintain an airtight seal around the penetrating element and prevent rigid contact between the penetrating element and the building structure. Fit the sleeve tightly to the building construction and seal airtight on both sides of the construction penetrated with acoustical sealant.

**END OF SECTION 23 05 48**

**SECTION 23 05 50**
**WIND RESTRAINT FOR HVAC SYSTEMS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

### 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 based on the current edition in effect at project location:
   1. Building Code of New York State (Section 1609 and 1613).
   2. Mechanical Code of New York State (Section 301, Item 301.15).
   3. American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures with Supplement No. 1 - Standard ASCE/SEI 7-16.

### 1.04 QUALITY ASSURANCE

A. General:
   1. The contractor shall provide Professional Engineer stamped and signed engineering calculations and details of wind restraint systems to meet total design lateral force requirements for support and restraint of mechanical systems. Engineer shall be licensed to practice in the state in which the project is located.
   2. The wind restraint engineering calculations and details shall provide the quantity of attachments and size/type of attachments for the mounting of an equipment curb or support rail to the building structure, and for attachment of the equipment or system to the equipment curb or support rail. It is not the intent for manufactured equipment curbs or support rails to be certified by their respective manufacturers, nor is it the intent for them to be certified by the Professional Engineer who is providing the wind restraint calculations and connection methodology.
   3. Systems requiring wind restraint including, but not limited to:
      a. Rooftop Air handling units.
      b. Exhaust fans.
      c. Condensing units.
      d. Ductwork.
      e. Piping.
      f. 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.

E. The Contractor shall provide photographs of the installed roof mounted equipment, showing the fully installed wind restraint anchoring, prior to the roofing material installation, as a formal submittal for verification that the work has been completed.

## PART 2 - PRODUCTS

### 2.01 CODE INFORMATION

A. This project is subject to the wind bracing requirements of the codes listed above. The following criteria are applicable to this project:
   1. Basic Design Wind Speed (V): 120 mph.
   2. Risk Category: IV
   3. Exposure Category: C
   4. Ground Elevation Factor (Ke): 1
   5. Combined Gust Factor for Rooftop Equipment (GCr): Per Section 29.4.1 of ASCE 7-2016, based on dimensions of individual rooftop equipment considered.
   6. Height and Exposure Adjustment Coefficient (λ): N/A - Building height is less than 60 ft.

### 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, fastener sizes and spacing, etc.
   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 3 - EXECUTION

### 3.01 INSTALLATION

A. Wind Restraint of Piping:
   1. All restraint systems shall be installed in strict accordance with the wind restraint design submittal.
   2. Installation of restraints shall not cause any change in position of equipment or piping, resulting in stresses or misalignment.

B. Wind Restraint of Ductwork and Equipment:
   1. All restraint systems shall be installed in strict accordance with the wind restraint design submittal.
   2. The interaction between mechanical and electrical equipment and the supporting structures shall be designed into the restraint systems.
   3. Installation of restraints shall not cause any change in position of equipment or ductwork, resulting in stresses or misalignment.
   4. Exhaust fans with hinge kits shall have wind restraint fasteners installed on the hinged side, same as the three (3) non-hinged sides.
   5. No rigid connections between equipment and the building structure shall be made that degrade the noise and vibration-isolation system specified.
   6. Do not install any equipment or duct that makes rigid connections with the building unless isolation is not specified.
   7. 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.

### 3.02 INSPECTION

A. The engineer who performs the delegated design for wind restraint shall inspect photos provided by the installing contractor to verify that the installation is in accordance with their

design and applicable codes. The delegated design engineer shall coordinate with the contractor(s) who have installed the work.

B. Upon final acceptance by the delegated design engineer of all work performed by the contractor(s), the delegated design engineer shall submit a letter to the Owner's Representative indicating that the installation of restraints complies with the requirements of their design and applicable codes.

**END OF SECTION 23 05 50**

## SECTION 23 05 53
## MECHANICAL IDENTIFICATION

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services as required for the complete installation designed in Contract Documents.

### 1.02 QUALIFICATION

A. All identification devices shall comply with ANSI/ASME A13.1 for lettering size, length of color field, colors, directional arrow and viewing angles.

### 1.03 SUBMITTALS

A. Submit manufacturer's technical product data and installation instructions for each identification material and device.

B. Submit valve schedule for each piping system indicating valve number, location, and valve function.

C. Submit schedule of pipe, equipment and name identification for review before stenciling or labeling.

### 1.04 MAKES

A. Allen Systems, Inc.; Brady (W.H.) Co.; Signmark Div.; Industrial Safety Supply Co., Inc.; Seton Name Plate Corp.

### PART 2 - PRODUCTS

### 2.01 GENERAL

A. Provide manufacturer's standard products of categories and types required for each application. In cases where this is more than one type specified for an application, selection is installer's option, but provide single selection for each product category.

B. All adhesives used for labels in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits as called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

### 2.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

### 2.03 PIPING IDENTIFICATION

A. Identification Types:

1. Pressure Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color coded, pressure sensitive vinyl pipe markers complying with ANSI/ASME A13.1.

a. Provide a 360° wrap of flow arrow tape at each end of pipe label.

| O.D. Pipe or Covering | Length of Color Field | Letter Size |
|---|---|---|
| 3/4 in. to 1-1/4 in. | 8 in. | 1/2 in. |
| 1-1/2 in., 2 in. | 8 in. | 3/4 in. |
| 2-1/2 in. to 6 in. | 12 in. | 1 1/2 in. |
| 8 in. to 10 in. | 24 in. | 2 1/2 in. |
| Over 10 in. | 32 in. | 3 1/2 in. |

B. Lettering:

1. Piping labeling shall conform to the following list:

| | |
|---|---|

| Pipe Function | Identification |
|---|---|
| Refrigerant Liquid | RL |
| Refrigerant Gas | RS |

## 2.04 VALVE IDENTIFICATION

A. Valve Tags:
   1. Standard brass valve tags, 2 in. diameter with 1/2 in. high numerals. Identify between heating and plumbing services with 1/4 in. letters above the valve number. Lettering to be stamped and in-filled black. Seton, or equal.
      a. Valve-tag Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Chart:
   1. Provide valve chart for all valves tagged as a part of this project. Frame and place under clear glass. Hang in Mechanical Room.
   2. Valve chart to include as a minimum, valve #, valve size, valve type, valve service description, valve location.

## 2.05 EQUIPMENT LABELS

A. Metal Labels for Equipment:
   1. Material and Thickness: Brass, 0.032 in. minimum thickness, and having predrilled or stamped holes for attachment hardware.
   2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 in. by 3/4 in.
   3. Minimum Letter Size: 1/4 in. for name of units if viewing distance is less than 24 in., 1/2 in. for viewing distances up to 72 in. and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   4. Fasteners: Stainless-steel rivets or self-tapping screws.
   5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2 in. x 11 in. bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

D. Provide for the following equipment:
   1. Air handling units
   2. Fans
   3. Air-cooled condensing units

## 2.06 ABOVE CEILING EQUIPMENT LOCATOR

A. 3/4 in. diameter adhesive stickers placed on ceiling grid. Color coded. Provide for the following:
   1. Fire dampers/smoke dampers - RED
   2. Plumbing valves - BLUE
   3. HVAC valves - ORANGE
   4. VAV boxes or reheat coils - GREEN
   5. Fans - YELLOW
   6. Pumps - BLACK

# PART 3 - EXECUTION

## 3.01 GENERAL

A. Provide piping identification with directional flow arrows for all piping on project, at maximum intervals of 20 ft.

1. For piping installed through floors or walls, provide at least one pipe label on each side of penetration, for each pipe function.
2. For piping adjacent to 3-way diverting/mixing valves and tee/wye branches, provide at least one pipe label on each side of valve/tee.
3. Label all abandoned piping if abandoned piping is allowed by Owner/Engineer. Document locations of all abandoned piping on as-builts.

B. Provide valve tags for all valves provided on project, except for service valves at terminal equipment.

C. Provide equipment tags for all equipment listed above.

D. Provide above ceiling equipment locator stickers on ceiling grid for all equipment listed above.

**END OF SECTION 23 05 53**

**SECTION 23 05 93**
**TESTING, ADJUSTING AND BALANCING**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for complete adjusting and balancing Work as required in Contract Documents.

B. This Section specifies the requirements and procedures of mechanical systems testing, adjusting, and balancing. Requirements include measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.

C. Test, adjust, and balance the following mechanical systems:
   1. Airside
      a. Supply air systems, all pressure ranges; including constant volume and variable volume systems.
      b. Return air systems.
      c. Exhaust air systems.

D. This Section does not include:
   1. Testing boilers and pressure vessels for compliance with safety codes;
   2. Specifications for materials for patching mechanical systems;
   3. Specifications for materials and installation of adjusting and balancing devices. If devices must be added to achieve proper adjusting and balancing, refer to the respective system sections for materials and installation requirements.
   4. Requirements and procedures for piping and ductwork systems leakage tests.

### 1.02 SUBMITTALS

A. Provide information in report form listing items required by specifications. Results shall be guaranteed. Contractor shall be subject to recall to site to verify report information before acceptance of the report by the Owner's Representative.

B. Strategies and Procedures Plan: Within thirty (30) days of Contractor's Notice to Proceed, submit testing and balancing strategies and step-by-step procedures as specified in Section 3.1.B, "Preparation", and consistent with those listed in Part 3 of this specification.

C. System Readiness Checklists: Within thirty (30) days of Contractor's Notice to Proceed, AABC agency shall provide system readiness checklists as specified in Section 3.1.C, "Preparation", to be used and filled out by the installing contractors verifying that systems are ready for Testing and Balancing.

D. Examination Report: Provide a summary report of the examination review required in Section 3.1.D to the Engineer, documenting issues that may preclude the proper testing and balancing of the systems.

E. Certified report format shall consist of the following:
   1. Title sheet with job name, contractor, engineer, date, balance contractor's name, address, telephone number and contact person's name and the balancing technician's name.
   2. Individual test sheets for air handlers, terminal units, air distribution, exhaust fans, duct traverses, pumps, air handling coils, reheat coils, radiation, convectors, cabinet unit heaters and unit ventilators.
   3. Manufacturer's pump and fan curves for equipment installed with design and actual operating conditions indicated.
   4. TAB Report Forms: Use standard forms from AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" or TABB's "Testing, Adjusting and Balancing Bureau".

## 1.03 DEFINITIONS

A. System testing, adjusting and balancing is the process of checking and adjusting all the building environmental systems to produce the design objectives. It includes:
   1. The balance of air and water distribution;
   2. Adjustment of total system to provide design quantities;
   3. Electrical measurement;
   4. Verification of performance of all equipment and automatic controls.

B. Test: To determine quantitative performance of equipment.

C. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g., reduce fan speed, throttling).

D. Balance: To proportion flows within the distribution system (submains, branches, and terminals) according to specified design quantities.

E. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results.

F. Report Forms: Test data sheets arranged for collecting test data in logical order for submission and review. This data should also form the permanent record to be used as the basis for required future testing, adjusting, and balancing.

G. Terminal: The point where the controlled fluid enters or leaves the distribution system. There are supply inlets on water terminals, supply outlets on air terminals, return outlets on water terminals, and exhaust or return supply or outside air inlets or outlets on terminals such as registers, grilles, diffusers, and louvers.

H. Main: Duct or pipe containing the system's major or entire fluid flow.

I. Submain: Duct or pipe containing part of the systems' capacity and serving two or more branch mains.

J. Branch Main: Duct or pipe serving two or more terminals.

K. Branch: Duct or pipe serving a single terminal.

## 1.04 QUALIFICATIONS

A. Follow procedures and methods published by one or more of the following:
   1. Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) or Testing, Adjusting and Balancing Bureau (TABB).
   2. Individual manufacturer requirements and recommendations.

B. Maintain qualified personnel at project for system operation and trouble shooting. TAB contractor shall change sheaves and perform mechanical adjustments in conjunction with balancing procedure.

C. Balancing contractor shall be current member of AABC, NEBB, or TABB.

D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in the AABC National Standards for Total System Balance and SMACNA TAB Procedural Guide.

## 1.05 GENERAL REQUIREMENTS

A. Before concealment of systems visit the job site to verify and advise on type and location of balancing devices and test points. Make changes as required to balance facilities.

B. Place systems in satisfactory operating condition.
   1. Adjusting and balancing shall be accomplished as soon as the systems are complete and before Owner takes possession.
   2. Initial adjustment and balancing to quantities as called for or as directed by the engineer, to satisfy job conditions.
   3. All outdoor conditions (Db, Wb, and a description of the weather conditions) at the time of testing shall be documented in the report.
   4. Airside

a. Prior to balancing, adjust balancing devices for full flow and replace temporary filters.
b. Provide sheaves and belts as required to meet system performance requirements for all belt-driven fan motors 10 HP and greater. Adjust and align sheaves to obtain proper settings and operation. Verify motors are not overloading.
c. Installing contractor shall replace dampers in new systems and identify dampers in existing systems that cannot be manipulated to satisfy balancing requirements.
d. Traverse main ducts to determine total system air quantities after all outlets have been set prior to final adjustment if the system does not meet design requirements. A sum of room CFM's is not acceptable.
e. If duct construction and/or installation prohibits proper traverse readings, provide coil measurements at main coils and/or fresh air intake traverse with units operating in 100% outside air mode (where applicable).

**1.06 CONTRACTOR RESPONSIBILITIES**

A. Provide Testing and Balancing agency one complete set of contract documents, change orders, and approved submittals in digital and hard copy formats.

B. Controls contractor shall provide required BAS hardware, software, personnel and assistance to Testing and Balancing agency as required to balance the systems. Controls Contractor shall also provide trending report to demonstrate that systems are complete.

C. Coordinate meetings and assistance from suppliers and contractors as required by Testing and Balancing agency.

D. Installing contractor shall replace or repair insulation as required by Testing and Balancing agency.

E. Have the HVAC systems at complete operational readiness for Testing and Balancing to begin. As a minimum verify the following:
1. Airside:
a. Provide additional dampers, sheaves and belts as required by Testing and Balancing agency.
b. Flag all manual volume dampers with fluorescent or other high-visibility tape.
c. Provide access to all dampers, test ports, nameplates and other appurtenances as required by Testing and Balancing agency.
d. All ductwork is complete with all terminals installed.
e. All volume, smoke and fire dampers are open and functional.
f. Clean filters are installed.
g. All fans are operating, free of vibration, and rotating in correct direction.
h. ASD start-up is complete and all safeties are verified.
i. System readiness checklists are completed and returned to Testing and Balancing agency.

F. Promptly correct deficiencies identified during Testing and Balancing.

G. Maintain a construction schedule that allows the Testing and Balancing agency to complete work prior to occupancy.

**PART 2 - PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

A. Provide tools, ladders, recording meters, gauges, thermometers, velometers, anemometers, Pitot tubes, inclined gauge manometers, magnehelic gauges, amprobes, voltmeters, psychrometers and tachometers required.

B. Instrumentation Calibration: Calibrate instruments at least every six (6) months or more frequently if required by instrument manufacturer.
1. Keep an updated record of instrument calibration that indicates date of calibration and the name of party performing instrument calibration.

## PART 3 - EXECUTION

### 3.01 PREPARATION

A. Examine Bid Documents and submittals and notify Owner's Representative and Engineer of any questions regarding balancing.
   1. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper Testing and Balancing of systems and equipment.
   2. Examine the approved submittals for HVAC systems and equipment.
   3. Examine equipment performance data including fan and pump curves.

B. Prepare a Testing and Balancing Strategies and Procedures Plan that includes:
   1. Equipment and systems to be tested.
   2. Strategies and step-by-step procedures for balancing the systems.
   3. Instrumentation to be used.
   4. Sample forms with specific identification for all equipment.

C. Prepare system-readiness checklists, as described in the AABC National Standards for Total System Balance and SMACNA TAB Procedural Guide, for use by contractors in verifying system readiness for Testing and Balancing. These shall include, at a minimum:
   1. Airside:
      a. All ductwork is complete with all terminals installed.
      b. All volume, smoke and fire dampers are open and functional.
      c. Clean filters are installed.
      d. All fans are operating, free of vibration, and rotating in correct direction.
      e. Permanent electrical power wiring and ASD start-up is complete and all safeties are verified.
      f. Automatic temperature-control systems are operational.
      g. Ceilings are installed.
      h. Windows and doors are installed.
      i. Suitable access to balancing devices and equipment is provided.
      j. Equipment and duct access doors are securely closed.

D. Examine construction and notify Owner's Representative and Engineer of outstanding issues related to balancing, as part of "Examination Report" submittal.
   1. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, clean permanent filters are installed, and controls are ready for operation.
   2. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected, configured by the controls contractor and functioning.
   3. Airside
      a. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas.
      b. Examine systems for installed balancing devices, such as test ports, gage cocks, flow-control devices, and manual volume dampers prior to pressure testing. Note the locations of devices that are not accessible for testing and balancing.

### 3.02 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" or TABB's "SMACNA TAB Procedural Guide" and this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those

removed. Restore vapor barrier and finish according to insulation Specifications for this Project.

C. Mark equipment and balancing device settings with paint or other suitable, permanent identification material, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

**3.03 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS**

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct airflow measurements.

E. Check airflow patterns from the outside-air louvers and dampers and the return and exhaust-air dampers, through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and function.

K. Check for proper sealing of air-handling unit components.

L. Check for proper sealing of air duct system.

**3.04 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS**

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure fan static pressures to determine actual static pressure as follows:
    a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.
    b. Measure static pressure directly at the fan outlet or through the flexible connection.
    c. Measure inlet static pressure of single-inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
    d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
2. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and treating equipment.
    a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.
3. Measure static pressures entering and leaving other devices such as sound traps, heat recovery equipment, and air washers, under final balanced conditions.
4. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.
5. Obtain approval from Engineer for adjustment of fan speed higher or lower than indicated speed. Make required adjustments to sheaves sizes, motor sizes, and electrical connections to accommodate fan-speed changes.
6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full cooling, full

heating, economizer, and any other operating modes to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.
   1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.
      a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
   2. Re-measure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

C. Measure terminal outlets and inlets without making adjustments.
   1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust terminal outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using volume dampers rather than extractors and the dampers at air terminals.
   1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
   2. Adjust patterns of adjustable outlets for proper distribution without drafts.

**3.05 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS**

A. Compensating for Diversity: When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a maximum set-point airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced airflow terminal units so they are distributed evenly among the branch ducts.

B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:
   1. Set outside-air dampers at minimum, and return-and exhaust-air dampers at a position that simulates full-cooling load.
   2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
   3. Measure total system airflow. Adjust to within indicated airflow.
   4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.
   5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow as described for constant-volume air systems.
      a. If air outlets are out of balance at minimum airflow, report the conditions but leave outlets balanced for maximum airflow.
   6. Re-measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.
   7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that the adequate static pressure is maintained at the most critical unit.
   8. Record the final fan performance data.

C. Pressure-Dependent, Variable-Air-Volume Systems with Diversity: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:
   1. Set system at maximum indicated airflow by setting the required number of terminal units at minimum airflow. Select the reduced airflow terminal units so they are distributed evenly among the branch ducts.
   2. Adjust supply fan to maximum indicated airflow with the variable-airflow controller set at maximum airflow.
   3. Set terminal units at full-airflow condition.
   4. Adjust terminal units starting at the supply-fan end of the system and continuing progressively to the end of the system. Adjust inlet dampers of each terminal unit to indicated airflow. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.
   5. Adjust terminal units for minimum airflow.
   6. Measure static pressure at the sensor.
   7. Measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.

## 3.06 TOLERANCES

A. Set HVAC system's flow rates within the following tolerances:
   1. Airside
      a. Supply, Return, and Exhaust Fans: Zero to plus 10 percent.
      b. Air Outlets and Inlets: Plus or minus 10 percent.
      c. Minimum Outside Air: Zero to plus 10 percent.
      d. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

## 3.07 FINAL TEST AND BALANCE REPORT

A. The report shall be a complete record of the HVAC system performance, including conditions of operation, items outstanding, and any deviations found during the Testing and Balancing process. The final report also provides a reference of actual operating conditions for the owner and/or operations personnel. All measurements and test results that appear in the reports must be made on site and dated by the technicians or Test and Balance Engineers.

B. The report must be organized by systems and shall include the following information as a minimum:
   1. Title Page:
      a. AABC or NEBB Certified Company Name.
      b. Company Address.
      c. Company Telephone Number.
      d. Project Identification Number.
      e. Location.
      f. Project Architect.
      g. Project Engineer.
      h. Project Contractor.
      i. Project Number.
      j. Date of Report.
      k. Certification Statement.
      l. Name, Signature, and Certification Number.
   2. Table of Contents.
   3. National Performance Guaranty.
   4. Report Summary:
      a. The summary shall include a list of items that do not meet design tolerances, with information that may be considered in resolving deficiencies.
   5. Instrument List:

a. Type
b. Manufacturer
c. Model
d. Serial Number
e. Calibration Date

C. Required Airside data - Test, adjust and record the following:
1. Motors:
a. RPM
b. BHP
c. Full load amps
d. Sheave sizes, number and size of belts
e. Shaft diameter
f. Complete nameplate data
2. Fans:
a. Cfm
b. RPM
c. Suction static pressure
d. Discharge static pressure
e. Sheave sizes, number and size of belts, key sizes, shaft, diameter
f. Complete nameplate data
g. Sketch of system's inlet and outlet connections
h. Location of test port
3. Duct: Traverse Zones:
a. Cfm
b. Static Pressure
4. AHU - (In both minimum O.A. and economizer modes):
a. Minimum outdoor air Cfm
b. Total discharge and return Cfm
c. Static profile thru unit
d. Complete nameplate data
5. Coil:
a. Entering air temperature (DB/WB)
b. Leaving air temperature (DB/WB)
c. Static differential
d. Face velocity and area
e. Cfm
f. Complete nameplate data
6. VAV Boxes:
a. Minimum Cfm
b. Maximum Cfm
7. Registers/Grilles/Diffusers:
a. Cfm
b. Set, adjust and record air flow pattern
8. Filter Banks:
a. Nameplate data
b. Static pressure drop

D. The final test and balance report shall be provided as a formal project submittal for review by the Engineer of Record.

**END OF SECTION 23 05 93**

**SECTION 23 07 10**
**INSULATION**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 SUBMITTAL

A. Submit product data, product description, manufacturer's installation instructions.

B. Submit schedule of types and thicknesses for each application, and location of materials.

### 1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 232010 - Piping Systems and Accessories.

B. Section 233100 - Sheet Metal and Ductwork Accessories Construction.

## PART 2 - PRODUCTS

### 2.01 GENERAL

A. See Exhibits at the end of this section for where insulating materials shall be applied, thickness, jacketing and remarks.

B. Provide work in compliance with the following Codes and Standards based on the current edition in effect at project location:
   1. Energy Conservation Code of New York State .

C. Insulation, jackets, adhesive, and coatings shall comply with the following:
   1. Products shall not contain asbestos, lead, mercury, or mercury compounds.
   2. Insulation, including jackets, finishes and adhesives on the exterior surfaces of ducts, pipes, and equipment, shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, when tested in accordance with ASTM E84 or UL 723.
      a. Plenums: Insulation materials shall be noncombustible or listed and labeled per ASTM E84 or UL 723.
      b. Treatment of jackets or facing for flame and smoke safety must be permanent. Water-soluble treatments are not permitted.
   3. All adhesives, coatings and sealants used for insulation in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits as called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.
   4. Provide materials which are the standard products of manufacturers regularly engaged in the manufacture of such products and that essentially duplicate items that have been in satisfactory use for at least two (2) years prior to bid opening. Provide insulation systems in accordance with the approved MICA or NAIMA Insulation Standards.
   5. Insulation shall be clearly marked with manufacturer's name, identification of installed thermal resistance (R) value, out-of-package R value, flame spread and smoke developed indexes in accordance with Energy Code requirements.
   6. Products that come into contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C 871.
   7. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable in accordance with ASTM C 795.

### 2.02 REFERENCE STANDARDS

A. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation; 2022.

B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

D. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

## 2.03 ACCEPTABLE MANUFACTURERS

A. Flexible Elastomeric: Armacell AP ArmaFlex/FS (Indoor: AP ArmaFlex up to 1", FS 1-1/2" to 2"; Outdoor: All sizes), Aeroflex (Indoors/Outdoors: All sizes), K-Flex Insul-Lock (Indoors: All sizes), or approved equal.

B. Fiberglass: Johns Manville, Knauf/Manson, Owen-Corning, or approved equal.

C. Polyisocyanurate: Johns Manville Trymer 25-50 PIR (Indoors), 2000XP (Outdoors), HiTherm, or approved equal.

D. Jacketing: Johns Manville (PVC, Aluminum), Polyguard Pro (Alumaguard), or approved equal.

E. Adhesives, Coatings, Mastics, Sealants: Childers, Foster, or approved equal.

## 2.04 FLEXIBLE ELASTOMERIC

A. Closed-cellular, sponge or expanded-rubber with integral vapor barrier.

B. Tube and Sheet:
   1. Product meeting ASTM C 534, Type I/II Grade 1.
   2. 'K' Value at 75°F mean temperature
      a. BTU-in/ft2 hr. °F (up to 1 in. wall thickness).
      b. BTU-in/ft2 hr. °F (1-1/2 in. to 2 in. wall thickness).

C. Sheet:
   1. Density: As required to meet specified R-value in Exhibit, unless otherwise noted.

## 2.05 FLEXIBLE FIBERGLASS

A. Glass fibers bonded with a resin.

B. Blanket:
   1. Product meeting ASTM C 553 Types I, II and III, and ASTM C 1290; Greenguard compliant.
   2. 'K' Value: 0.27 BTU-in/ft2 hr. °F at 75°F mean temperature.
   3. Maximum Service Temperature (Faced): 250°F.
   4. Vapor Retarder Jacket: FSK conforming to ASTM C 1136 Type II.
   5. Density: As required to meet specified R-value in Exhibit, unless otherwise noted.

## 2.06 RIGID FIBERGLASS

A. Pre-formed glass fibers bonded with a thermosetting resin.

B. Pipe:
   1. Product meeting ASTM C 547, ASTM C 585, and ASTM C 795; rigid, molded, noncombustible.
   2. 'K' Value: 0.23 BTU-in/ft2 hr. °F at 75°F mean temperature.
   3. Maximum Service Temperature: 1000°F.
   4. Vapor Retarder Jacket: Factory applied ASJ/SSL conforming to ASTM C 1136 Type I, secured with self-sealing longitudinal laps and butt strips.
   5. Field applied PVC Fitting Covers with Flexible Fiberglass Insulation: Proto Corporation 25/50 or Indoor/Outdoor, UV resistant fittings, jacketing and accessories, white or colored. Fitting cover system consists of pre-molded, high-impact PVC materials with blanket type fiberglass wrap inserts. Blanket fiberglass wrap inserts shall have a thermal conductivity ('K') of 0.26 at 75°F mean temperature. Closures to be stainless steel tacks, matching PVC tape, or PVC adhesive per manufacturer's recommendations.

C. Board:
   1. Product meeting ASTM C 612 Type IA and IB. Maximum Service Temperature: 450º F.

2. 'K' Value: 0.24 BTU-in/ft2 hr. °F at 75°F mean temperature.
3. Vapor Retarder Jacket:
    a. ASJ conforming to ASTM C 1136 Type I
    b. FSK or PSK conforming to ASTM C 1136 Type II.
4. Density: As required to meet specified R-value in Exhibit, unless otherwise noted.

## 2.07 RIGID POLYISOCYANURATE

A. Pre-formed closed-cellular foam, rigid molded.

B. Pipe:
1. Product meeting ASTM C591, rigid molded, noncombustible.
2. 'K' Value: 0.19 BTU-in/ft2 hr. °F at 75°F mean temperature.
3. Maximum Service Temperature: 300°F.
4. Vapor Retarder Jacket: Dow Saranex Vapor Retarder Film and Tape.
5. Fittings shall match pipe requirements.

C. Board:
1. Product meeting ASTM C1289 Type I, Class I.
2. "K" value: 0.17 BTU-in/ft2 hr. °F at 75°F mean temperature.
3. Density: As required to meet specified R-value in Exhibit, unless otherwise noted.

## 2.08 FIELD APPLIED JACKETS

A. PVC: High-impact UV resistant PVC; roll stock ready for shop or field cutting and forming.
1. Thickness: 30 mil.
2. PVC Jacket Color: White.

B. Aluminum: Factory cut and rolled to indicated sizes. Product meeting ASTM B 209/C 1729.
1. Material: 3003-alloy, and H-14 temper.
2. Finish: Bare Stucco Embossed finish.
3. Thickness (including insulation):
    a. Rigid insulation installations: 0.016 (up to 24-in overall diameter) and 0.024 (greater than 24-in overall diameter).
    b. Flexible insulation installations: 0.016 (up to 8-in overall diameter); 0.020 (9-in to 11-in overall diameter); 0.024 (12-in to 24-in overall diameter); 0.032 (25-in to 36-in overall diameter); 0.040 (greater than 36-in overall diameter).
4. Moisture Barrier: 3 mil thick, heat-laminated polyethylene and Surlyn.
5. Elbows: Preformed multi-piece, 45 and 90-degree, short and long-radius elbows; same material, finish, and thickness as roll.
6. Banding: 304SS, 0.020" thick, 0.75" wide. Provide same material wing seals. Screws, rivets, stapes or any other fastener capable of penetrating vapor barrier are not allowed.

C. Alumaguard : Self-adhesive, rubberized asphalt, multi-ply, UV-resistant, aluminum foil/polymer laminate with self-healing foil-faced weather barrier.
1. Thickness: 54 mil, 0.3 lb/sq-ft.
2. Peel Adhesion: >12 lb/in (144 oz/in).
3. Tensile Strength: 35 lb/in.
4. Puncture resistance: 15 lb.
5. Permeance: 0.00, Product meeting ASTM E 96.
6. Warranty: Minimum 10 years.

## 2.09 ADHESIVES, COATINGS, MASTICS, SEALANTS

A. Provide per manufacturer product requirements for associated system and application/installation location.

## PART 3 - EXECUTION

### 3.01 GENERAL REQUIREMENTS

A. All materials shall be installed by skilled labor regularly engaged in this type of work and installed in strict accordance with manufacturer's recommendations, building codes, and industry standards. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system per manufacturer requirements. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

B. Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such a manner as to protect all raw edges, ends and surfaces of insulation. No glass fibers shall be exposed to the air. Install insulation with longitudinal seams at top and bottom of horizontal runs. Install multiple layers of insulation with longitudinal and end seams staggered and with the least number of joints possible.

C. All pipe and duct insulation shall be continuous through hangers.

D. Provide thermal insulation on clean, dry surfaces and after piping, ductwork and equipment (as applicable) have been tested. Do not cover pipe joints with insulation until required tests are completed.

E. All cold surfaces that may "sweat" must be insulated. Vapor barrier must be maintained; insulation shall be applied with a continuous, unbroken moisture and vapor seal. All hangers, supports, anchors, or other projections that are secured to cold surfaces shall be insulated and vapor sealed to prevent condensation.

F. Items such as boiler manholes, handholds, clean-outs, ASME stamp, and manufacturers' nameplates, may be left uninsulated unless omitting insulation would cause a condensation problem. When such is the case, appropriate tagging shall be provided to identify the presence of these items. Provide neatly beveled edges at interruptions of insulation.

G. Provide protective insulation as required to prevent personnel injury: Piping from zero to seven feet above all floors and access platforms including hot (above 140□F) piping and any other related hot surface.

H. If any insulation material has become wet because of transit or job site exposure to moisture or water, the contractor shall not install such material, and shall remove it from the job site.

I. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

J. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches [OR insert value] beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.

K. For above-ambient services, do not install insulation to the following:
   1. Vibration-control devices.
   2. Testing agency labels and stamps.
   3. Nameplates and data plates.

### 3.02 PENETRATIONS

A. Aboveground Exterior Wall and Roof Penetrations: Install insulation continuously through penetrations.
   1. Seal penetrations with flashing sealant.
   2. For applications requiring only indoor insulation, terminate insulation above through surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
   3. Extend jacket of outdoor insulation outside wall/roof flashing at least 2-in. beyond flashing. Seal jacket to flashing with flashing sealant per roofing manufacturer requirements.

B. Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Interior Floor, Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Fire-Rated Floor, Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
   1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

**3.03 PIPE INSULATION**

A. All pipes shall be individually insulated. Cover valves, fittings and similar items in each piping system with insulation as applied to adjoining pipe run. Extra care must be taken on piping appurtenances to insure a tight fit to the piping system.

B. Piping insulation is allowed to be reduced in thickness only when a specific UL assembly detail for piping passing thru a rated wall indicates a maximum insulation thickness that is less than this specification section calls for. In this case reduce the insulation thickness just for the rated wall penetration. The reduction of insulation thickness shall be limited to the length of the penetration only.

C. Coordinate insulation installation requirements for heat tracing that may apply.

**3.04 DUCTWORK INSULATION**

A. Provide external thermal insulation for ductwork. Not required where ducts have internal acoustical insulation. Make special provisions at dampers, damper motors, thermometers, instruments, and access doors.

B. Provide factory ASJ jacket for ductwork required to be insulated and to be painted.

**3.05 EQUIPMENT INSULATION**

A. Apply insulation with joints firmly butted as close as possible to the equipment surface.

**3.06 EXHIBIT "I" - PIPE INSULATION MATERIALS**

| Service | Insulation Material | Thickness | Remarks |
|---|---|---|---|
| Refrigeration Suction Line Piping (Heating mode; temperature up to 200□F) | Flexible Elastomeric | 1-1/2 in. and Larger: 2 in.<br>1-1/4 in. and Smaller: 1-1/2 in. | |
| Refrigeration Suction Line Piping (Cooling only mode; temperature up to 60□F) | Flexible Elastomeric | 7/8 in. and Larger: 1in.<br>3/4 in. and Smaller: 1/2 in. | |
| Refrigeration Liquid Line Piping (Heating or cooling mode; temperature up to 140□F) | Flexible Elastomeric | 1-1/2 in. and Larger: 1-1/2 in.<br>1-1/4 in. and Smaller: 1 in. | |
| Concealed AC unit condensate drains | Flexible Elastomeric | All Sizes: 1/2 in. | |

### 3.07 EXHIBIT "II" - DUCT INSULATION MATERIALS

| Service | Insulation Material | Thickness | Remarks |
|---|---|---|---|
| Supply (concealed) | Flexible Fiberglass | 2 in. | Min. installed R value of 6 |
| Supply (within mechanical rooms or exposed at 8'-0" or less above finished floor) | Rigid Fiberglass | 1-1/2 in. | Min. installed R value of 6 |
| Supply (exposed within the conditioned space served) | Not insulated | Not insulated | Does not include the associated supply ductwork within the Mechanical Room or supply duct to the conditioned space. |
| Outside air ducts and plenums, connections and mixing boxes | Rigid Fiberglass | 2 in. | Min. installed R value of 8 |
| Neutral ventilation air supply ducts (between 65□F and 80□F) | Not insulated | Not insulated | |
| Return and exhaust within heated building envelope | Not insulated | Not insulated | |
| Exhaust, relief or vent ducts and plenums (concealed) | Flexible Fiberglass | 2 in. | Min. installed R value of 6<br><br>Insulate ducts 15 ft. from exterior opening and plenums. |
| Exhaust, relief or vent ducts and plenums (exposed) | Rigid Fiberglass | 1-1/2 in. | Min. installed R value of 6<br><br>Insulate ducts 15 ft. from exterior opening and plenums. |
| Exhaust in cold attic spaces or other un-heated spaces | Flexible Fiberglass | 3 in | Min. installed R value of 8 |
| Interior ductwork indicated to be lined (L); exterior ductwork indicated to be lined (2L) | Not insulated | Not insulated | |

| | | | |
|---|---|---|---|
| Exterior supply or return ducts | Rigid Polyisocyanurate | 3 in. | Min. installed R value of 12 |

**END OF SECTION 23 07 10**

## SECTION 23 20 10
## PIPING SYSTEMS AND ACCESSORIES

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services as required for the complete installation designed in Contract Documents.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 078413 - Penetration Firestop Systems.

### 1.03 SUBMITTALS

A. Schedule of pipe materials, fittings and connections.

B. Applicable miscellaneous materials (i.e. dielectric protection, hangers, inserts, supports, sealing elements, etc.).

### PART 2 - PRODUCTS

### 2.01 GENERAL

A. Pipe and fittings shall be new, marked with manufacturer's name and comply with applicable ASTM and ANSI Standards.

B. All adhesives, sealants, primers and paint used for piping in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

### 2.02 REFERENCE STANDARDS

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.

B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.

C. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2018.

D. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984, with Editorial Revision (2019).

E. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.

F. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV); 2020.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

### 2.03 COPPER TUBE AND FITTINGS - PRESS FITTINGS

A. Tubing Standard: Copper tubing shall conform to ASTM B75 or ASTM B88.

B. Fitting Standard: Copper fittings shall conform to ASME B16.18, ASME B16.22, or ASME B16.26.

C. Press Fitting: Copper press fittings shall conform to the material and sizing requirements of ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM.

D. Make: Viega Pro-Press, Nibco, Tyco Grinnell, Elkhart Apolloxpress, Mueller.

### 2.04 COPPER DRAINAGE TUBE AND FITTINGS - SOLDER JOINT

A. Pipe: ASTM B306, Type DWV, hard temper.

B. Fittings: Wrought copper, ANSI B16.29 or cast bronze, ANSI B16.23; solder end connections.

C. Solder Materials: No lead solder, using alloys made from tin, copper, silver and nickel.

D. Make: Harris "Stay-Safe 50" and "Bright", Engelhard "Silverbright 100", Canfield "Watersafe" or approved equal.

## 2.05 REFRIGERATION PIPING

A. Type ACR hard temper deoxidized, dehydrated, and sealed copper tubing, refrigerant grade.

B. Refrigerant grade wrought copper fittings. Long radius elbows.

C. Factory made suction traps, Melco Type PT.

D. Piping and system shall meet the requirements of Safety Code for Mechanical Refrigeration, ANSI/ASHRAE 15-1994 and ASME/ANSI B31.5.

E. Brazing Materials: Harris, Inc. Stay Silv 5 or approved equal.

F. Make: Mueller, Howell Metal, Cerro, Cambridge-Lee, Universal Tube.

## 2.06 DIELECTRIC PROTECTION

A. Description: Assembly or fitting having insulating material isolating joined dissimilar metals to prevent galvanic action and stop corrosion.

B. Dielectric unions shall not be used due to their tendency to leak. Provide a dielectric waterway fitting or a brass nipple for dielectric protection. A brass valve is also an acceptable method of dielectric protection.

C. Flanges: Factory-fabricated, companion-flange assembly, for 150 or 300 psig minimum pressure to suit system fluid pressures and temperatures with flange insulation kits and bolt sleeves.

D. Waterway Fittings: 300 psi maximum working pressure at 230°F, male threaded or grooved ends, electroplated ductile iron or steel body with LTHS high temperature polyolefin polymer liner.

E. Make: EPCO, Capitol Manufacturing, Watts, Surejoint, Victaulic, or approved equal.

F. The use of brass valves, brass nipples (3 in. and larger) and Shurjoint epoxy coated transition coupling IPS-CTS may be used for dielectric isolation. Dielectric transition fittings shall be Shurjoint Model DE30-GG for sizes 2 in. through 8 in., which shall provide effective insulation between the steel and copper systems to avoid galvanic local cell and stray current problems. The dielectric transition fitting shall be made of ductile iron per ASTM A536 Gr. 65-45-12, electric deposition coated, with a virgin PP (propylene) lining.

## 2.07 HANGERS, INSERTS, AND SUPPORTS

A. Hangers, Inserts, Clamps: B-Line, Grinnell, Michigan Hanger, PHD Manufacturing, Anvil, Hilti.

B. Hangers:
   1. Adjustable, wrought malleable iron or steel with electroplated zinc or cadmium finish. Copper plated or PVC coated where in contact with copper piping. Hot-dipped galvanized finish for exterior locations.
   2. Adjustable ring type where piping is installed directly on hanger for piping 3 in. and smaller.
   3. Adjustable steel clevis type for 4 in, and larger, and where insulation passes through hanger.
   4. Hangers sized to permit passage of insulation through the hanger for all piping.
   5. Nuts, washers and rods with electroplated zinc or cadmium finish. Hot-dipped galvanized finish for exterior locations.

C. Hanger Shields:
   1. Pre-Insulated Type:
      a. Insulated pipes shall be protected at point of support by a 360° insert of high density, 100 psi waterproof calcium silicate, encased in a 180° sheet metal shield. Insulation insert to be same thickness as adjoining pipe insulation and extend 1 in. beyond sheet metal shield. Insulation shall be provided with a factory installed ASJ.
   2. Field-Insulated Type:
      a. #18 USSG, galvanized steel shields, minimum 120° arc. Provide ICA-HAMFAB-BLOCK, 18# density molded fiberglass inserts, between pipe and hanger shield to

maintain proper spacing for insulation. Insulation inserts shall extend 1 in. beyond the sheet metal shields. Material shall comply with ASTM E84 25/50, have a thermal conductivity of K=.30 (stable) and have a service temperature of -120°F to +650°F. Install in accordance with manufacturer's printed instructions.

3. Shield Sizing:

| PIPE SIZE | SHIELD LENGTH | MINIMUM GAUGE |
|---|---|---|
| 1/2 in. to 3-1/2 in. | 9 in. | 20 |
| 4 in. | 9 in. | 20 |
| 5 in. and 6 in. | 9 in. | 20 |
| 8 in. to 12 in. | 12 in. | 18 |
| 14 in. to 24 in. | 18 in. | 16 |

4. Hanger shield gauges listed are for use with band type hangers only. For point loading (roller support), increase shield thickness by one gauge, and length by 50%.

D. Hanger Spacing Schedules: (Based upon most stringent requirement of MCNYS and ((ASME B31.9)))

| COPPER OR PLASTIC PIPE SIZE | COPPER PIPE HANGER SPACING | PLASTIC PIPE HANGER SPACING | HANGER ROD SIZE |
|---|---|---|---|
| 3/4 to 1 in. | 6 ft. | 3 ft. | 3/8 in. |
| 1-1/4 in. | 6 ft. | 4 ft. | 3/8 in. |
| 1-1/2 to 2 in. | 8 ft. | 4 ft. | 3/8 in. |
| 2-1/2 to 4 in. | 10 ft. | 4 ft. | 1/2 in. |
| 5 in. and larger | 10 ft. | 4 ft. | 3/4 in. |

| STEEL PIPE SIZE | STEEL PIPE HANGER SPACING | HANGER ROD SIZE |
|---|---|---|
| 3/4 to 1 in. | 8 ft. | 3/8 in. |
| 1-1/4 in. | 10 ft. | 3/8 in. |
| 1-1/2 to 2-1/2 in. | 12 ft. | 3/8 in. |
| 3 to 4 in. | 12 ft. | 1/2 in. |
| 5 in. and larger | 12 ft. | 3/4 in. |

E. Inserts: Carbon steel body and square insert nut, galvanized finish, maximum loading 1,300 lbs., for 3/8 in. to 3/4 in. rod sizes. Drill through decking for hanger rods and secure devices with integral support plate strap with sheet metal screws. Devices shall have a safety factor of four.

F. Beam Attachments:
1. C-Clamp, locknut, electroplated finish, UL listed, FM approved, for pipe sizes 2 in. and smaller.
2. Center load style with clamp attachments that engage both edges of beam, electroplated finish, UL listed, FM approved, for pipe sizes larger than 2 in., refer to "Supports" for additional requirements.

G. Supports:
1. Provide intermediate structural steel members where required for hanger attachment. Secure member to structure. Select size of members based on a minimum factor of safety of four.
2. For Weights Under 1000 lbs.: Insert, "U" shaped channel, beam clamps or other structurally reviewed support. The factor of safety shall be at least four. Follow manufacturer's recommendations.

3. For Weights Above 1000 lbs.: Drill through floor slabs and provide flush plate welded to top of rod or provide additional inserts and hangers to reduce load per hanger below 1000 lbs.
4. Make: Hilti, ITW Ramset, Phillips "Red Head", or approved equal.

H. Trapeze Hangers:
1. For use on 1-1/2 in. and smaller piping only.
2. Hangers shall be supported with rod sized with a safety factor of four.
3. May be manufactured type "U" shaped channel, or suitable angle iron or channel. Round off all sharp edges.
4. Securely fasten piping to trapeze with "U" bolt or straps, dissimilar metals shall not touch, use isolation gaskets.
5. Make: B-Line, Kindorf, Unistrut, or approved equal.

**2.08 PIPING ACCESSORIES**

A. Escutcheon Plates: Provide escutcheon plates on uninsulated piping in exposed and finished areas. Steel or cast brass polished chrome, split hinge type with setscrew, high plates where required for extended sleeves.

**2.09 SLEEVES**

A. Standard Type:
1. Schedule 40 black steel pipe sleeves shall be used for sleeves in horizontal and vertical applications through structural surfaces. Sleeves shall extend a minimum of 1 in. beyond both sides of the structure surface being penetrated. The sleeve shall be sized to account for the total diameter of the service, inclusive of insulation and the appropriate annular space for firestopping installation or requirements of the sealing element manufacturer.
2. Full circle water stop collar for sleeves located in below grade walls, wet wells and waterproofed surfaces. The collar shall be fabricated from steel plate and welded to the sleeve around its entire circumference.
3. Schedule 40, PVC sleeves or sheet metal sleeves for nonstructural surfaces. Sheet metal sleeves shall be 18 gauge minimum and braced to prevent collapsing. Sleeves shall extend a minimum of 1/2 in. beyond both sides of the non-structural vertical surface being penetrated. The sleeve shall be sized to account for the total diameter of the service, inclusive of insulation and the appropriate annular space for firestopping.

B. Pre-Insulated Type:
1. Adjustable or fixed length metal cans, 24 gauge minimum sized for 1 in. spacing between insulation and can. Insulation shall consist of a 360° waterproofed calcium silicate insert sized to extend 1 in. beyond wall or floor penetration. Calcium silicate insert shall be the same thickness as adjoining pipe insulation. Spacing between shield and can packed at each end with double neoprene rope positively fastened.

**2.10 SEALING ELEMENTS**

A. Expanding neoprene link type, watertight seal consisting of interlocking links with zinc plated bolts.
1. Make: Thunderline "Link-Seal" Series 200, 300 or 400, Pyropac, Calipco.

B. Waterproof Type:
1. Exterior Walls, Below Grade, Above Floor: Synthetic rubber material with zinc plated bolts. Make: "Link-Seal" Series 200, 300 or 400, Pyropac, Calipco.

**2.11 PIPING MATERIALS AND SCHEDULE**

A. See Exhibit "A", "Schedule of Piping Materials" at end of this Section for (HVAC) piping.

**PART 3 - EXECUTION**

**3.01 EQUIPMENT AND SYSTEMS**

A. Provide equipment and systems in accordance with laws, codes, and provisions of each applicable section of these specifications. Accurately establish grade and elevation of piping

before setting sleeves. Install piping without springing or forcing (except where specifically called for), making proper allowance for expansion and anchoring. Arrange piping at equipment with necessary offsets, union, flanges, and valves, to allow for easy part removal and maintenance. Offset piping and change elevation as required to coordinate with other work. Avoid contact with other mechanical or electrical systems. Provide adequate means of draining and venting units, risers, circuits and systems. Install drains consisting of a tee fitting with a 3/4 in. ball valve with hose end cap and chain, at low points in hydronic piping system mains, and elsewhere as required for system drainage.

B. Conceal piping unless otherwise called for. Copper tubing shall be cut with a wheeled tubing cutter or other approved copper tubing cutter tool. The tubing must be cut square to permit proper joining with the fittings. Ream pipes after cutting and clean before installing. Cap or plug equipment and pipe openings during construction. Install piping parallel with lines of building, properly spaced to provide clearance for insulation. Make changes in direction and branch connections with fittings unless submitted and accepted per Part 2. Do not install valves, union and flanges in inaccessible locations. Provide trap seal of adequate depth on drain pans.

C. Provide reducers at all control valves, where control valve is smaller than pipeline size. Reducers for steam control valves shall be eccentric type. Provide unions at each side of every control valve and reducers directly adjacent to the unions.

D. Provide reducers at all balance valves, where balance valve is smaller than pipeline size.

**3.02 PIPING OVER ELECTRICAL EQUIPMENT**

A. Contractor shall route piping to avoid installation directly over electric equipment, including, but not limited to panels, transformers, disconnects, starters, motor control center, adjustable speed drives and fused switches.

B. Piping shall not be installed in the dedicated electric and working space as defined by NEC 110. Dedicated electrical space is generally equal to the depth and width of electrical equipment, and extends 6 ft. above the electrical equipment, or to a structural ceiling. Dedicated working space is a minimum of 30 in. wide or the width of equipment (whichever is larger) a minimum of 6 ft.-6 in. tall, with a depth of 3 ft. to 9 ft. depending on the voltage.

**3.03 CONDENSATE DRAIN PIPING**

A. Condensate drain piping shall be sloped a minimum of 1% in the direction of flow to an approved place of disposal. Condensate shall not be disposed into a street, alley or other areas so as to cause a nuisance.

B. Condensate drain piping shall not be less than 3/4" internal diameter and shall not decrease in size from the drain pan connection to the location of condensate disposal.

C. Condensate drains shall be trapped as required by the equipment or appliance manufacturer.

D. Condensate drain piping shall be configured to permit the clearance of blockages and performance of maintenance without requiring the drain piping to be cut.

**3.04 REFRIGERATION PIPING**

A. Fittings brazed with silver brazing alloy. Guarantee refrigerant charge for one year from date of final acceptance. Provide for flexibility at compressor connections. Piping and system shall meet the requirements of Mechanical Refrigeration Safety Code, ANSI B9.1. Clean piping, then pump-down and evacuate system to 0.1 in. VAC break vacuum with dry nitrogen and re-evacuate to 0.1 in. VAC and hold for four (4) hours; then charge system. Charge with refrigerant as recommended by manufacturer.

**3.05 HANGERS, INSERTS AND SUPPORTS**

A. Piping shall not be supported by wires, band iron, chains, or from other piping. Support each pipe with individual hangers from concrete inserts, welded supports, or beam clamps of proper configuration and point loading design requirements for each location including the designated safety factor. Trapeze hangers are acceptable for racking of multiple pipes of 1-1/2 in. or less

in size. Follow manufacturer's safe loading recommendations. Suspend with rods of sufficient length for swing and of size as called for, using four nuts per rod. Provide additional rustproofed structural steel members, where required for proper support. Provide oversized hangers where insulation/supports must pass between pipe and hanger. Only concentric type hangers are permissible on piping larger than 2-1/2 in., "C" types are permitted for piping 2-1/2 in. and smaller. Provide riser clamps for each riser at each floor.

B. Provide a pipe hanger within 12 in. of pipe unions and piping connections to equipment, in order to facilitate disconnections of piping without pipe sagging.

**3.06 HANGERS ATTACHED TO JOISTS**

A. Individual hangers may be suspended directly from the bottom chord panel point provided that the sum of the concentrated loads within the chord panel does not exceed 100 pounds and the attachments are concentric to the chord. (Eccentrically loaded joists using beam clamps or other attachment methods are not acceptable.)

B. For nominal concentrated loads between panel chords, which have been accounted for in the specified uniform design load for the joists, this Contractor is to provide struts to transfer the load to a panel point on the opposite chord as reviewed and acceptable by the Structural Engineer of Record.

**3.07 PIPE CONNECTIONS**

A. Solder Connections: Nonacid flux and clean off excess flux and solder.

B. Press Connections: Copper press fittings shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer.

C. Brazed Connections: Make joints with silver brazing alloy in accordance with manufacturer's instructions. Remove working parts of valves before applying heat.

D. Dielectric Protection: Provide dielectric protection devices at ALL piping connections and ALL equipment connections, where dissimilar metals meet. Follow all applicable manufacturer's recommendations at equipment connections. Dielectric protection systems are not required for air or gas systems.

**3.08 HANGER SHIELDS**

A. Provide at hangers for all piping. Pre-insulated type or field-insulated type at Contractor's option.

**3.09 SLEEVES**

A. Provide for pipes passing through floors, walls or ceilings.

B. Pre-Insulated Type: Required for refrigerant piping.

C. Standard Type: Provide for piping, except as called for.

D. Extend 1/8 in. above finished areas. In above grade mechanical and other areas with floor drains; use steel pipe sleeves 2 in. above floor. Use pipe sleeves in bearing walls, structural slabs, beams and other structural surfaces, and where called for. Sleeves shall be as small as practical, consistent with insulation, so as to preserve fire rating.
   1. Fill abandoned sleeves with concrete. Provide rubber grommet seals for pipes passing through ducts or air chambers or built-up housings.

**3.10 SLEEVE PACKING**

A. Seal void space at sleeves as follows:
   1. Interior Locations: Firmly pack with fiberglass and caulk.
   2. Exterior Walls and Below Grade Cored Holes: Use sealing element.
   3. Fire Rated, Partitions and Floor Slabs: Use fire rated sealing elements, materials and methods. Provide per manufacturer's instructions to maintain firestop.

4. Waterproofed Walls and Floors: Use waterproof sealing element, device, or compound.

### 3.11 ESCUTCHEON PLATES

A. Provide polished chrome escutcheon plates for uninsulated exposed piping passing through floors, walls or ceilings in finished areas.

### 3.12 TESTS

A. Test piping and accessories before insulation, or concealment. Repeat as many times as necessary to prove tight system. Notify Owner's Representative at least seven days in advance of each test. Isolate valves and equipment not capable of withstanding test pressures. Make leaks tight; no caulking permitted. Remove and replace defective fittings, pipe or connections. Furnish necessary pumps, gauges, equipment, piping, valving, power and labor for testing. Certify that tests have been successfully completed.

B. Test: No change in pressure under stable temperature conditions.

C. Schedule of Test Requirements:
   1. Refrigeration:
      a. After installation, charge system with dry nitrogen to manufacturer's recommended pressure.
      b. System shall hold this charge with no pressure drop for 24 hours.
   2. Equipment: Test at working pressures.

### 3.13 PROTECTION AGAINST PHYSICAL DAMAGE

A. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1-1/2 in. from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 in. (No. 16 gage) shall cover the area of the pipe where the member is notched or bored, and shall extend note less than 2 in. above sole plates and below top plates.

### 3.14 PIPE LINE SIZING

A. Pipe sizes called for are to be maintained. Pipe sizing changes made only as reviewed by Owner's Representative. Where discrepancy in size occurs, the larger size shall be provided.

B. EXHIBIT "A" - PIPING MATERIALS (HVAC)

| SERVICE | PIPE MATERIALS | FITTINGS | CONNECTIONS |
|---|---|---|---|
| Refrigerant | Type ACR refrigerant grade hard temper, deoxidized copper | Wrought copper, brazed end | Sil-Flo "5" silver brazing |
| Vent, overflow, condensate drain | Type DWV or Type M copper | Wrought copper | Threaded or solder |
| Vent, overflow, condensate drain (optional) | Type L copper | Wrought copper or cast bronze | Viega Pro-Press, Nibco Press, Elkhart Apolloxpress |

**END OF SECTION 23 20 10**

## SECTION 23 31 00
## SHEET METAL AND DUCTWORK ACCESSORIES CONSTRUCTION

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services required for the complete installation designed in Contract Documents.

### 1.02 QUALITY ASSURANCE

A. Ductwork shall be fabricated and installed in compliance with latest edition of the following standards and with the edition of the Codes in effect at the time the building permit is obtained.
   1. SMACNA Duct Construction Standards - Metal and Flexible Ductwork.
   2. SMACNA Duct Liner Application Standard.
   3. SMACNA HVAC Air Duct Leakage Test Manual.
   4. Mechanical Code of New York State.
   5. Energy Conservation Construction Code of New York State.
   6. Plans and Specifications which exceed the requirements in any of the referenced standards.

B. All sheet metal shall be fabricated and installed by an experienced Contractor specializing in this type of work.

C. All ductwork and fittings shall have a computer generated label affixed to the exterior surface of each section, detailing all applicable information including the duct dimensions, gauge, reinforcement type/class and connection type by systems manufacturer. Galvanizing thickness shall be clearly stenciled on each duct section.

D. All ductwork on the project shall meet the SMACNA Duct Cleanliness for New Construction Guidelines, "Advanced Level" of duct cleanliness for production, delivery, storage and installation of ductwork.

### 1.03 SUBMITTALS

A. Ductwork Shop Drawings.

B. Duct Access Doors.

C. Flexible Duct.

D. Submit a complete shop standard manual including miscellaneous materials, and construction details for all shop fabricated materials including, but not limited to, volume dampers, turning vanes, duct sealant, equipment flexible connections, access doors, flexible duct, acoustical duct lining, etc.

### 1.04 GENERAL

A. All adhesives, sealants, primers and paint used for ductwork in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

### 1.05 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).

B. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.

C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2022.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

E. ASTM E477 - Standard Test Method for Laboratory Measurements of Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers; 2020.

F. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

G. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

H. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.

I. UL 181A - Closure Systems for Use with Rigid Air Ducts; Current Edition, Including All Revisions.

J. UL 181B - Closure Systems for Use with Flexible Air Ducts and Air Connectors; Current Edition, Including All Revisions.

K. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

## 1.06 DUCTWORK CLASSIFICATION

A. Duct systems are to be classified and constructed per the SMACNA Velocity-Pressure classification system as follows:
   1. All ductwork shall be constructed for a minimum pressure class of 2 in. w.g. (unless stated otherwise) for the following systems, as applicable:
      a. Supply duct downstream of terminal units.
      b. Typical low pressure supply ductwork.
      c. Typical return ductwork.
      d. Typical low pressure exhaust ductwork.
   2. Supply duct upstream of terminal units shall be constructed for a minimum pressure class of 3 in. w.g. unless otherwise stated or required as per below.
   3. Pressure classes above 3 in. w.g. shall be provided as follows, based upon the external static pressure as scheduled for each specific fan.

| Scheduled External Static Pressure | Pressure Class |
|---|---|
| Over 3 in. up to 4 in. w.g. | 4 in. w.g. |
| Over 4 in. up to 6 in. w.g. | 6 in. w.g. |
| Over 6 in. up to 10 in. w.g. | 10 in. w.g. |

## 1.07 DUCTWORK SHOP DRAWINGS

A. Prepare minimum 1/4 in. scale drawings:
   1. Detailed ductwork shop drawings shall include size, layouts and pressure classifications. Any ductwork installed without benefit of review by the Engineer of Record may be subject to replacement at the expense of the Contractor.
   2. Constructed from actual field inspections and measurements so as to assure a complete job.
   3. Incorporate dimensions of actual equipment proposed for use on the project.
   4. Showing adequate sections, elevations, and plan views and indicating the bottom of ductwork elevations from the finished floor.
   5. Indicating all volume dampers, fire dampers, smoke dampers, damper access doors and other accessories required for a completed project.

B. Call to the attention of the Engineers immediately, any major deviations from the Contract Drawings, which must be made. All deviations shall be documented in writing.

C. Indicate roof, wall and floor opening dimensions and locations shown on shop drawings.

D. Submit prints to each Contractor of the other trades for review for interference's and coordination with their work.

## PART 2 - PRODUCTS

### 2.01 DUCTWORK MATERIALS

A. Unless otherwise called for, provide materials in accordance with Exhibit I at the end of this section.

### 2.02 SQUARE AND RECTANGULAR DUCTWORK

A. Materials:
   1. Galvanized Sheetmetal: Comply with ASTM A653 and A924, with G90/Z275 coating.
   2. Stainless-steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in Exhibit "I"; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D or No. 3 as indicated in Exhibit "I".
   3. Aluminum sheets: Comply with ASTM B 209 (ASTM B 209M) Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.
   4. Gauges per SMACNA HVAC Duct Construction Standards, Metal and Flexible.

B. Transverse and longitudinal duct seams reinforcement shall conform to appropriate tables and figures per SMACNA Velocity-Pressure Classification for duct construction.
   1. Transverse joints shall be sealed with duct joint sealant. "Ductmate" or "Nexus" 4-bolt connection systems may be used in lieu of standard construction.
   2. Field assembled longitudinal seams shall be sealed with duct sealant. Factory or shop fabricated rolled or machine pressed longitudinal seams does not require sealant.

C. Corner closures shall be required as described and illustrated by SMACNA Duct Construction Standards.

D. Throat radius on all elbows shall not be less than the dimension of the duct plane of radius. Where this cannot be maintained, use shorter radius with internal guide vanes, or square elbow with turning vanes.

E. Bracing and hanging of ductwork shall be per SMACNA Standards for size and system class of ductwork being used.

F. Any transformations shall not reduce the ductwork cross-sectional area. Maximum angle in straight duct, 20□ for diverging flow and 30□ for contraction flow. Transformation from square to round or flat to oval seams welded or brazed.

### 2.03 ROUND DUCTWORK

A. Standard Round Ductwork:
   1. Materials:
      a. Galvanized Sheet metal: Comply with ASTM A653 and A924, with G90/Z275 coating.
      b. Stainless-steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in Exhibit "I"; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D or No. 3 as indicated in Exhibit "I".
      c. Aluminum sheets: Comply with ASTM B 209 (ASTM B 209M) Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.
      d. Gauges per SMACNA Duct Construction Standards. Spiral lock-seam or longitudinal fusion-welded.
   2. All spiral ducts shall have locked seams so made as to eliminate leakage under pressure for which this system has been designed. Longitudinal seams duct shall have fusion-welded butt seams.
   3. Round Ductwork Fittings:
      a. All fittings fabricated per SMACNA Standards for round and flat-oval ductwork, material to match straight pieces of ductwork.
      b. Fittings shall have continuous, welded seams.

c. 90□ tees shall be conical type. 90□ tees and 45□ laterals up to and including 12 in. diameter tap size shall have a radiused entrance into the tap, produced by machine or press forming. The entrance shall be free of any restrictions.
d. Round taps off the bottom of rectangular ducts down to diffusers shall be made with a 45□ square to round shoe-tap.

4. Elbows:
   a. Diameters 3 in. through 8 in.: Two-section stamped and continuously welded elbows, material to match straight pieces of ductwork.
   b. Over 8 in.: Gored construction with standing seam construction and internally sealed or continuously welded. Less than 35□ - two gores, 36□ to 70□ - three gores, over 71□ - five gores.
   c. Fabricated to a centerline radius of 1.5 times the cross-section diameter.
5. Joints:
   a. For duct construction pressure 3 in. w.g. or greater:
      1) Round Joints:
         (a) Unexposed Duct 3 in. - 30 in. Diameter: Connect round duct with a one piece interior slip coupling, at least two gauges heavier than duct wall, beaded at center and fastener to duct with screws. Seal joint with an approved sealant applied continuously around both end of coupler prior to assembling and after fastening.
         (b) All Exposed Duct and Unexposed Duct 30 in. - 72 in. Diameter: Install using a three piece, gasket flanged-joint consisting of two internal flanges, with integral mastic sealant, and one external closure band, which compress the gasket between the internal flanges.
            (1) Acceptable Manufacturer: Ductmate Industries "Spiralmate" system or approved equal.
         (c) Above 72 in. Diameter: Install using companion angle flanged joints as defined in Figure 3-1 of the 2005 SMACNA Manual, "HVAC Duct Construction Standards, Metal and Flexible" Third Edition. Refer to manual for proper sizing and construction details.
         (d) Dust collection systems and exposed duct 3 in. - 14 in. use a one piece, polyethylene lined gasket connector with integrated bolt for the closure system.
            (1) Acceptable Manufacturer: Ductmate Industries "Quicksleeve" or approved equal.
   b. Pipe-to-pipe joints in diameters up to 60 in. shall be by the use of sleeve couplings, reinforced by rolled beads.
   c. Pipe-to-fitting joints in diameters up to 60 in. shall be by slip-fit of projecting collar of the fitting into the pipe.
   d. Insertion length of sleeve coupling and fitting collar shall be 2 in. up to 36 in. diameter and 4 in. above 36 in. diameter.
   e. Pipe-to-pipe and pipe-to-fitting connections in ductwork above 60 in. in diameter shall be made by angle ring flanges. The flange on the pipe shall be a 2 in. x 2 in. x 3/16 in. angle attached to the pipe with a continuous weld. The fittings shall have a loose ring "Van Stone" flange. A 5/8 in. flange shall be provided to act as a gasketing surface for sealing with the angle ring being a rolled, welded ring 2 in. x 2 in. x 3/16 in. Bolt hole spacing for angle rings shall be 6 in. centers.
   f. If longitudinal seam duct greater than 60 in. in diameter is supplied in lengths greater than 4 ft., one angle ring must be welded to the duct on 4 ft. centers for support.

B. Make: Semco, United Sheet Metal.

**2.04 DUCTWORK SEALING**

A. SMACNA Duct Sealing Classification shall be used for duct systems using the following criteria:

1. Ductwork and all plenums with pressure class ratings shall be constructed to Seal Class A, as required to meet the requirements of SMACNA Duct Construction Standards and with standard industry practice, including transverse joints, longitudinal seams, fitting connections, and all penetrations of the duct wall.
2. Openings for rotating shafts shall be sealed with bushings or other devices that seal off air leakage. Pressure sensitive tape shall not be used.
3. All connections shall be sealed, including but not limited to spin-ins, taps, other branch connections, access doors, access panels and duct connections to equipment.
4. Sealing that would void product listings is not required.
5. Spiral lock seams need not be sealed.

B. Duct sealant for indoor applications shall be non-fibrated, water based, Hardcast Iron-Grip IG-601, Ductmate PRO Seal, Foster 32-17 or Childers CP146.

C. Duct sealant for outdoor applications shall be fibrated, water based, Hardcast Versa-Grip VG-102, Ductmate Fiberseal, Foster 32-17 or Childers CP148.

D. Sealants and tapes shall be listed and labeled in accordance with UL 181A or UL181B and marked according to type.

**2.05 TURNING VANES**

A. Provide in mitered elbows as shown on contract drawings. Vanes 36 in. or longer shall be double wall air foil type. All turning vanes shall be installed as per the latest SMACNA Standards. Turning vane size and spacing shall be as per SMACNA. Turning vane spacing greater than SMACNA Standards is not acceptable.

B. Turning vanes shall be Harper or equivalent double wall turning vanes fabricated from the same material as the duct.

C. Turning vane front and back panels shall be securely locked together with adequate crimping to prevent twisting of vane. Vane shall be capable of withstanding 250 pounds of tensile load when secured according to the manufacturer's instructions.

D. Rails for mounting turning vanes shall have self locking, friction fit tabs designed to facilitate proper alignment of vanes. Tab spacing shall be as specified in Figure 4-3 of the 2005 SMACNA Manual, "HVAC Duct Construction Standards, Metal and Flexible". Rail systems with non-compliant tab spacing shall not be accepted.

E. Acoustical Turning Vane: Shall be used in applications that require quiet operating systems. Mounting rails shall have friction insert tabs that align the vanes automatically.

F. Acceptable Manufacturer: Ductmate Industries PRO-Rail Turning Vane or approved equal.

**2.06 DAMPERS IN DUCTWORK**

A. Blade Type Volume Dampers: Constructed per SMACNA, one gauge heavier than duct material, securely fastened to 3/8 in. sq., cold rolled steel operator rod. Provide Ventlock 639 elevated dial regulator for 2 in. insulated ductwork.

B. Multiple Blade Type Volume Dampers: Provide multiple blade volume dampers in ductwork above 12 in. in height.
1. Heavy duty, manual balancing dampers suitable for application in HVAC systems with velocities to 1,500 ft. per minute, open position and max. pressure of 3 in. w.g. close position. Ruskin MD 35 or equivalent.
2. Fabrication:
   a. Frame: 5 in. x minimum 16 gauge roll formed, galvanized steel hat-shaped channel, reinforced at corners. Structurally equivalent to 13 gauge U-channel.
3. Blades:
   a. Style: Single skin with 3 longitudinal grooves.
   b. Action: Parallel.
   c. Orientation: Horizontal.
   d. Material: Minimum 16 gauge equivalent thickness, galvanized steel.

e. Width: Nominal 6 in.

4. Bearings: Molded synthetic sleeve, turning in extruded hole in frame.
5. Linkage: Concealed in frame.
6. Axles: Minimum 1/2 in. diameter, plated steel, hex-shaped, mechanically attached to blade.
7. Control Shaft: 3/8 in. square plated steel.
8. Finish: Mill galvanized.
   a. Actuator: Hand quadrant for 3/8 in. square extended shaft.
   b. Hand Quadrant Standoff Bracket: 2 in. standoff for insulated ductwork.
   c. Oillite bearings.
   d. Factory Sleeve: Minimum 20 gauge thickness, minimum 12 in. length.

C. Fire and Smoke Dampers: See "Fire and Smoke Dampers" Section.

## 2.07 FLEXIBLE AIR DUCTS AND CONNECTORS

A. Flexible air ducts and connectors shall be constructed in compliance with NFPA Bulletin 90A, 90B and UL Standard 181 and shall be listed and labeled as Class I Air Duct.

B. Flexible air ducts and connectors shall be tri-laminate:
   1. Consisting of corrosion resistant galvanized steel helix encapsulated by a double lamination of polyethylene or spun bond nylon.
   2. Factory applied (R 6.0 ) fiberglass exterior insulation, sheathed in a seamless, tri-directionally reinforced, metalized polyester, exterior vapor barrier.
   3. R-value shall be classified by Underwriters Laboratories, and certified by the Air Diffusion Council, in accordance with ADC Flexible Duct Performance and Installation Standard (1991), using ASTM C-518, at installed wall thickness, on flat insulation only. Comply with ASHRAE/IESNA 90.1.
   4. Recommended operating pressure for flexible ductwork shall be three times maximum system press but not less than 6 in. w.g. positive pressure for 4 in. - 20 in. dia., 5 in. w.g. negative pressure through 16 in. dia., 1 in. negative pressure for 18 in. and 20 in. dia. Maximum velocity of 5500 fpm.
   5. Operating temperature range - 20°F to 250°F, intermittent @1/2 in. pos. w.g. max., -20°F to 140°F, continuous at maximum pressure.
   6. Flame Spread: 25 max. smoke developed rating: 50 max.
   7. Porous inner core flexible duct shall not be used.

C. Static pressure and thermal performance shall be tested and certified in accordance with Air Diffusion Council (ADC) Test Code FD-72-R1 under conditions of 140°F for 164 hours and 180°F for 4 hours.

D. Acoustical performance shall be certified in accordance with ASTM E 477 and/or Air Diffusion Council Test Code FD-72-R1.
   1. Minimum Acoustic Performance:
      a. The insertion loss (dB) of a 6 foot length of duct when tested in accordance with ASTM E477 at a velocity of 1000 feet per minute shall be at least:

| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
|---|---|---|---|---|---|---|
| 8 inch dia. | 26 | 27 | 27 | 31 | 32 | 27 |
| 12 inch dia | 22 | 26 | 24 | 31 | 31 | 20 |

E. Friction loss and leakage for flexible duct only shall be certified in accordance with Air Diffusion Council Test Code FD-72-R1. Leakage for connections shall be accordance with UL 181 requirements.

F. Basis-of-Design: Flexmaster 6B (R-6.0) .

G. Acceptable Manufacturers:
   1. Dundas-Jafine Type SPC R6.0

2. Hart & Cooley Type F216 (R-6.0)
3. Type M-KE (R-6.0)
4. Atco Rubber Products, Inc. Type 036 (R-6.0)

## 2.08 FLEXIBLE DUCT ELBOW SUPPORT

A. Provide flexible duct elbow support for flexible duct connected directly to a diffuser collar.

B. Elbow support shall be a radius forming brace designed to form flexible duct into a 90° elbow not less than one duct diameter in centerline radius.

C. Elbow support shall be manufactured from 100% recycled copolymer polypropylene with a universal fit of 4 in. thru 16 in. and be UL listed.

D. Basis-of-Design: Titus Flexright.

## 2.09 FLEXIBLE CONNECTIONS TO FANS AND EQUIPMENT

A. Basis of Deign: Ventfabrics, Inc.

B. Acceptable Manufacturers: Ductmate Industries, Inc., Duro Dyne Inc., Elgen Manufacturing, Ward Industries, Inc.; a division of Hart & Cooley, Inc.

C. Materials: Flame-retardant or noncombustible fabrics, water and mildew resistant UL Standard 214.

D. Coatings and Adhesives: Comply with UL 181, Class 1.

E. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 in. wide attached to two (2) strips of 2-3/4-in. wide, 0.028-in. thick, galvanized sheet steel or 0.032 in. thick aluminum sheets. Provide metal compatible with connected ducts.

F. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
   1. Minimum Weight: 26 oz./sq. yd.
   2. Tensile Strength: 480 lbf/in. in the warp and 360 lbf/in. in the filling.
   3. Service Temperature: Minus 40 to plus 200°F.

G. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
   1. Minimum Weight: 24 oz./sq. yd.
   2. Tensile Strength: 530 lbf/in. in the warp and 440 lbf/in. in the filling.
   3. Service Temperature: Minus 50 to plus 250°F.

H. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
   1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
   2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
   6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
   7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-in. movement at start and stop.

## 2.10 ACCESS DOORS

A. General:
   1. Provide access doors of adequate size to allow easy access to the equipment that will require maintenance. Provide insulated or acoustically lined doors to prevent condensation where applicable.

2. Manufacturer to provide an installed neoprene gasket around perimeter of access door for airtight seal.
3. Systems 3 in. w.g. or less shall utilize a hinged, cam, or hinged and cam square framed access door.
4. Systems 4 in. w.g. and above shall utilize a sandwich type access door. Construct doors in accordance with Figure 7-3 of the 2005 SMACNA Manual, "HVAC Duct Construction Standards, Metal & Flexible" Third Edition.
5. Approved Manufacturer: Ductmate Industries "Sandwich" style door or approved equal.
6. All access doors shall be continuous piano hinged type, unless noted otherwise.
7. Non-hinged only allowed where clearance to ceiling does not allow a full 90□ swing.
8. Double panel insulated type when used in insulated duct.
9. Single panel uninsulated type allowed in un-insulated duct.
10. Pressure rated according to system in which being installed. Door-to-frame and frame-to-duct gasketing.
11. Provide specified Seal Class A or B ductwork sealing around frame, and hand adjust the latch tension for proper seal, on all access doors other than sandwich panel (Ductmate) style.
12. MINIMUM access door size for ducts 12 in. or less in depth is 12 in. x 8 in.
13. MINIMUM access door size for ducts 12 in. to 18 in. in depth is 18 in. x 14 in.
14. MINIMUM access door size for ducts more than 18 in. in depth is 24 in. x 18 in.
15. In ducts which require multiple section fire dampers due to duct size, provide one access door for each fire damper section.
16. Access doors for fire and smoke dampers shall be permanently labeled with 1 in. high lettering reading "SMOKE DAMPER", "FIRE DAMPER" or FIRE/SMOKE DAMPER".

B. Door Types:
1. Low Pressure Systems (2 in. w.g. pressure class): National Controlled Air ADH-1, Ruskin ADH22, Vent Products 9701, Air Balance FSA-100, Safe Air SAH, Nailor.
2. Medium and High Pressure Systems (3 in. w.g. pressure class and higher):
   a. Rectangular Duct: Ductmate Industries "Ultimate" Style Door, or equal.
   b. Round Duct: Ductmate Industries Round Sandwich type, or equal. 8 in. x 4 in. for ducts 14 in. and less in diameter. Ductmate Industries Round Sandwich type 16 in. x 12 in. for ducts more than 14 in. in diameter.
   c. Furnish and install factory supplied protector molding on cut medal edge for all Ductmate access doors.

## 2.11 ACOUSTIC-THERMAL DUCT LINING IN DUCTWORK

A. General: Comply with NFPA Standard 90 and NAIMA Standard AHC-101.

B. Materials: ASTM C 1071, Type I. Glass mineral wool insulation coated with an anti-microbial EPA registered coating that seals the airstream surface fibers into a smooth, low-friction surface acoustic ductliner shall be of thickness shown in the table. Density at 1.5 PCF. Maximum "K" value to be 0.24 btu/in. /sq. ft. /degrees F. /hr. when tested in accordance to ASTM C177. Acoustic duct liner to be suitable for use up to 6000 feet per minute air velocity and temperatures up to 250°F. The acoustic duct liner shall not accelerate the corrosion of steel, copper or aluminum. The liner shall not absorb greater than 3% by weight when tested per ASTM C1104. Acoustic duct liner shall provide the minimum sound absorption coefficients shown below when tested per ASTM C423 and ASTM E795, Mounting Type A.

| Octave Band Frequencies Hz | | | | | | | |
|---|---|---|---|---|---|---|---|
| Thickness | 125 | 250 | 500 | 1000 | 2000 | 4000 | NRC |
| 1-1/2 in. | .23 | .50 | .87 | .92 | .93 | .93 | .80 |
| 2 in. | .37 | .76 | 1.02 | 1.00 | .98 | .92 | .95 |

C. Thickness: Unless otherwise noted, all supply air ductwork indicated to be acoustically lined, shall have 1-1/2 in. thick liner with a minimum R value of 6. Return or exhaust ductwork, if acoustically lined, shall be of a thickness specifically noted. Note that per the symbol list (L)

equals 1-1/2 in. thick. If called for on the plans, (2L) equals 2 in. thick.

D. Fire Hazard Classification: Flame spread rating of not more than 25 and a smoke developed rating of no higher than 50, when tested in accordance with ASTM E84, UL 723, UL/ULC S102-M88 and NFPA 255.

E. Liner Adhesive: Comply with NFPA Standard 90A, ASTM C919, and maximum VOC requirements of LEED EQ 4.1 and EQ 4.2.

F. Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment, or welding attachment to duct. Provide fasteners that do not damage the liner when applied as recommended by the manufacturer, that do not cause leakage in the duct, and will indefinitely sustain a 50 pound tensile dead load test perpendicular to the duct wall.
   1. Fastener Pin Length: As required for thickness of insulation, and without projecting more than 1/8 inch into the airstream.
   2. Adhesive for Attachment of Mechanical Fasteners: Comply with the "Fire Hazard Classification" of duct liner system.

G. Design Equipment: Knauf Atmosphere.

H. Acceptable Makes: Knauf Atmosphere, Certainteed ToughGard R.,.

I. For duct velocities above 4000 fpm, provide metal "build-outs" of proper height, welded to the ductwork for turning vanes and dampers.

## 2.12 CABLE SUSPENSION SYSTEM

A. Ductwork not required to be exterior insulated in exposed installations may be installed using a cable suspension system.

B. Ductwork shall be installed using load rated, stainless steel cable suspension systems. Cables shall be pre-cut lengths, type 316 stainless steel with fused ends, and pre-made end attachments.

C. Cable grips shall be of 316 stainless steel and have an internal tamperproof cable release mechanism.

D. Stress distribution saddles shall be prescribed in addition for the support of rectangular duct on corners as necessary.

E. Hangers shall have a manufacturer's published safe working load and have a 5 to 1 safety factor.

F. Hang and support ductwork as defined in the latest edition of SMACNA Manual, "HVAC Duct Construction Standards, Metal & Flexible".

G. Adjustable steel cable hanging system consisting of spring loaded, serrated clamping mechanism shall be tested and certified in compliance with all applicable SMACNA standards for upper and lower attachment methods.
   1. All approved systems must be installed using matching components including steel cable, clamping mechanism and hardware approved by the manufacturer for its corresponding load rating. No Substitution of manufacturer's components is permitted.
   2. Approved systems must be installed per the manufacturer's specific instructions and must not exceed the stated working load rating at any point throughout the system.

H. Supports, bar/angle reinforcements, and other products that are not part of the duct that are manufactured of uncoated mild steel shall either be painted with two (2) coats of primer or shall be manufactured of a galvanized equivalent material.

I. Approved Manufacturer: Ductmate Industries "Clutcher" Cable Hanging System or Gripple Inc.

## 2.13 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Ventlock 699 or 699-2 based upon insulation thickness.

C. Install duct test holes where required for duct traverse testing and balancing purposes.

## PART 3 - EXECUTION

### 3.01 REQUIREMENTS

A. Equipment and systems shall be installed in accordance with local and state codes and regulations having jurisdiction. Bracing and hanging of ductwork shall be per SMACNA - HVAC Duct Construction Standard.

B. Install all ductwork concealed and tight to the structure above unless noted otherwise on shop drawings. Fabricate only after the approval of shop drawings, and in locations to avoid interferences. Ductwork installed without approved shop drawings, which requires removal/modification and/or reinstallation due to conflicts or improper installation shall be repaired at no cost to the Owner.

C. Sizes given on contract drawings are inside dimensions.

D. Keep openings continuously closed and sealed with protective plastic wrapping during construction to prevent entrance of dirt and debris.

E. Extend access openings, damper rods and levers, to outside of external insulation make systems airtight.

F. No piping, conduit or other obstruction to airflow is permitted in ductwork.

G. Provide necessary openings, hanger inserts, framing, chases, and recesses, not provided by other trades.

H. Exposed exhaust or return registers and grilles shall be flush with face of duct; exposed supply registers and grilles shall be mounted outside airstream with 45□ shoe-tap extension collars.

I. Provide 14 gauge sleeves for ducts passing through Mechanical Room floors. Set sleeves 4 in. above finished floor in Mechanical Rooms, seal watertight to floor.

J. Where a return or exhaust duct is shown to be left open ended, provide hardware mesh screen at opening.

K. Do not utilize flexible ductwork or connection in any way to connect variable or constant volume boxes to ductwork.

L. For duct penetrations of non-rated walls, provide sheet metal angle framing or sheet metal closure panels around the entire perimeter of each duct wall penetration on both sides of the wall, where the gap exceeds 1/4 inch. Where the gap is less than 1/4 inch, the gap may be caulked on both sides of the wall. Non-rated wall penetrations SHALL NOT be fire caulked under any circumstances.

M. For duct penetrations of rated walls, see Specification Section 230500 - Basic Mechanical and Electrical Requirements.

N. Ductwork that is called for to be welded shall be fully welded, continuous around the entire perimeter at all joints/seams, and shall be fully airtight and watertight.

### 3.02 FLEXIBLE CONNECTIONS

A. Provide flexible connections for the intake and discharge connections of duct connected to fans and air handling equipment.

B. Round connections are to be made with adhesive and metal drawbands with ends tightly bolted.

C. Rectangular connections shall be made with material securely held in grooved seam between flanges. Attach with adhesive and mechanical fasteners on 6 in. centers.

D. Connections shall be made with a minimum of 2 in. space between duct and equipment collars, installed in line, and with 1 in. excess material folded so as not to interfere with airflow through connection.

E. Mechanically fastened and sealed, with specified duct sealant, at duct and equipment connections.

**3.03 FLEXIBLE AIR DUCTS AND CONNECTORS**

A. "Air duct" applies to conduit or passageway for conveying air to or from heating, cooling, air conditioning or ventilating equipment but not including the plenum as defined in NFPA 90A. "Air connector" applies to conduit for transferring air between an air duct or plenum and an air terminal device or an air inlet or an air outlet as defined by the NFPA 90A.

B. For round to oval connections, provide round-oval flexible adapter.

C. Flexible air ducts and connectors shall be provided in fully extended condition, free from kinks.

D. Flexible air ducts and connectors shall not be used in systems with entering air temperatures in excess of 250°F.

E. Flexible air ducts and connectors shall use only the minimum length required to make the connection and shall be installed in the horizontal or vertical position. Flexible elbows are not acceptable. Do not exceed a maximum length of 48 in., fully extended.

F. Flexible air ducts and connectors shall use minimum 1/2 in. wide positive locking, steel worm drive clamp, or nylon plenum rated straps for joints and connections. One clamp or strap for the inside core liner and one clamp or strap for the outer jacketing. When non-metallic (nylon) straps are used, they should be listed and labeled to standard UL 181B. Fastener package should be marked UL 181 B-C.

G. Collars to which flexible duct is attached shall be beaded and a minimum of 2 in. in length. Wrap twice with UL 181 tape and secure with clamp or strap. Sleeves used for joining two sections of flexible duct shall be beaded and a minimum of 4 in. in length. The draw band shall be positioned behind the bead on the metal collar.

H. Outer vapor barrier and insulation shall be slid over inner core and collar, wrapped twice with UL 151 tape and secured with a clamp or strap.

I. Connections shall be per SMACNA "HVAC Duct Construction Standards - Metal and Flexible", Air Diffusion Council "Flexible Duct Performance and Installation Standards" and NAIMA Installation Standards.

J. Flexible duct shall be supported at manufacturer's recommended intervals, but no greater distance than 2'-6" on center and prior to all 90 degree bends. Maximum permissible sag shall be 1/2 in. per foot of support spacing. Provide a minimum of one hanger on each run of flexible duct.

K. A connection to rigid duct or equipment shall be considered a support joint. Long horizontal duct runs with sharp bends shall have additional supports before and after the bend approximately one duct diameter from the centerline of the bend.

L. Hanger or saddle material in contact with the flexible duct shall be of sufficient width to prevent any restriction of the internal diameter of the duct when the weight of the supported section rests on the hanger or saddle material. In no case shall the material contacting the flexible duct be less than 1-1/2 in. wide. Factory installed suspension systems integral to the flexible duct are an acceptable alternative hanging method when the manufacturer's recommended procedures are followed.

M. The hanger shall be strapped around the flexible duct and secured to the structure above. Hangers shall not be attached to other mechanical or electrical objects. Hangers may be attached to an approved trapeze. Ceiling grid shall not be used to fabricate a trapeze. Support hangers shall be installed horizontal. Screws shall not be used to penetrate the flexible duct to attach to the hanger.

N. Provide flexible duct connections and splices in accordance with manufacturer's recommended installation instructions.

O. Seal flexible duct connections with sealing materials listed and labeled in accordance with UL 181B. Mechanically secure connections with approved clamping materials.

**3.04 TURNING VANES**

A. Install only in square elbows of equal dimensions.

B. Install as per latest SMACNA Standards.

C. Secure vane runners to duct with spot welding, riveting or sheet metal screws.

D. When installing in ductwork with internal insulation.
   1. Install runners in ductwork inside insulation and bolt through insulation and duct sides, welding bolts to insure rigid installation. Provide build-outs for duct Velocity-Pressure classes above 2 in. w.g.

**3.05 DUCT CLEANLINESS AND CLEANING AFTER INSTALLATION**

A. Duct Cleanliness:
   1. All ductwork on the project shall meet the SMACNA Duct Cleanliness For New Construction Guidelines, "Advanced Level" of duct cleanliness for production, delivery, storage and installation of ductwork.
   2. Prior to shipment to the jobsite, all duct ends and openings must be covered with a heavy duty, dual-ply, clear polyethylene protective film. Open ends are to be kept covered during transport, storage, and installation. As ductwork is installed at the job site, open ends are to be covered to maintain cleanliness.
   3. The film must be securely affixed to protect against dirt and debris, and must be translucent to facilitate inspection of interior surfaces without removing the film. The film is have a elongation rating of 600% and a break strength of 13.1 lbs./in. The film shall contain no VOC's, and shall leave no residue on duct after removal.
   4. Manufacturer: Ductmate Industries ProGuard (heavy duty grade clear).

B. Cleaning After Installation:
   1. Interior surfaces shall be free of dust and debris prior to initial startup. Protect equipment which may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes. Any cleaning of duct systems shall comply with recommendations of NAIMA and NADCA.
   2. Clean external surfaces of foreign substances that might cause corrosion, deterioration of the metal, or where ductwork is to be painted.
   3. Clean debris from system before fans are turned on.
   4. Keep openings continuously closed during the construction period.
   5. Pay damages resulting from dirt blown on painted or other finished surfaces.
   6. Repair or replace damaged fan wheels, dampers, or other system parts damaged as a result of debris.
   7. Clean system as many times as required until the entire system is dirt free.

**3.06 INSTALLATION OF ROUND DUCTWORK**

A. Use factory-fabricated couplings for joints.

B. After the joint is slipped together, sheet metal screws are placed 1/2 in. from the joint bead for mechanical strength.

C. Sealer is applied to the outside of the joint and covering the screw heads.

D. Flanged joints shall be made with neoprene rubber gaskets.

**3.07 TEST OF DUCTWORK**

A. Conduct duct leakage tests per SMACNA "HVAC Air Duct Leakage Test Manual" and per the requirements of the2020 Energy Conservation Construction Code of New York State, for ductwork systems as indicated below. Positive pressure leakage testing is acceptable for negative pressure ductwork. The rate of air leakage (CL) must be less than or equal to 4.0, as determined by the equation in the code referenced above, which reads: CL=F/P0.65 where F

= measured leakage rate in CFM per 100 sq. ft. of duct surface, and P = static pressure of the test. When leakage above stated limits occurs, ascertain location of leaks and rebuild, repair, or seal the ductwork as required. Repeat tests as required to obtain allowable leakage rates. Prepare a report similar to that suggested by SMACNA and submit for review. Duct testing shall be conducted in the presence of the Owner's Representative.

B. Systems designed to operate at static pressures of 3.0 in. w.g. or greater: Representative sections totaling no less than 25% of the total duct area, per system, for the designated pressure class shall be tested as well as all associated ductwork located out-of-doors. All areas to be tested shall be coordinated with the engineer based on the approved ductwork shop drawings.

C. Provide test reports indicating pressure tests performed. Include date, section tested, test pressure and leakage rate.

D. Ductwork not required to be tested for leakage, shall be checked and guaranteed to meet the standards of the specified SMACNA Duct Seal Class A. Air balancing and testing shall be used to determine satisfactory operation of duct systems. Balancing reports indicating excessive leakage amounts shall be required to rebuild, repair or seal ductwork having excessive leakage.

**3.08 DAMPERS AND AIR CONTROL DEVICES**

A. Provide volume dampers at all air outlets, diffusers, grilles and as noted on plans. Provide volume dampers at all low pressure supply, return and exhaust, branch ducts and as noted on the plans.

B. Provide dampers necessary to permit proper balancing of air quantities. Comply with code requirements for smoke and fire control. Prevent introduction of uncontrolled outside air into building through roof and wall openings.

C. When dampers are installed in acoustically lined ductwork, install with insulated "build-outs" per SMACNA.

D. Install fire and smoke dampers in accordance with "Fire and Smoke Dampers" Section and applicable codes.

E. Install all dampers furnished as part of "Building Management System" Section.

**3.09 ACCESS DOORS**

A. Provide for access to upstream side of duct mounted reheat coils, dampers, damper motors, fire dampers, smoke dampers, smoke detectors, control devices, fan bearings, and equipment requiring periodic inspection or service. Provide labels for fire and smoke dampers as called for in Part 2 - Products.

B. For ducts that are too small to install an access door of the minimum specified size, provide a 12 in. long section of removable ductwork for maintenance and inspection access. Removable ductwork shall be fastened between device requiring access and next duct section with duct flanges or Donaldson Torit clamp with PVC foam seal. For ducts that are required to be insulated, provisions shall be made to allow insulation to be easily removed and re-installed.

**3.10 DUCT SUPPORTS**

A. Provide per SMACNA, same material as duct. Hanger bands to extend down sides and turn under bottom 2 in. Minimum two metal screws per hanger. Angle iron on larger duct spaced per building structural system but not greater than 8 ft. Provide extra support angles as required.

B. Provide additional supports as required to support reheat coils, air terminal units, filter enclosures, and any other duct mounted equipment independent from the associated ductwork system.

### 3.11 ACOUSTIC-THERMAL DUCT LINING

A. Increase metal duct dimensions to accommodate lining. Adhere lining to interior side of duct; minimum 90% coverage of Benjamin Foster 85-20 fire retardant adhesive, UL approved. Stapling method of attaching will not be permitted. Mechanical fasteners shall not pierce the sheet metal. Installing fasteners with spacing as per SMACNA Standards. Multiple layers of liner to achieve indicated thickness is prohibited.

B. Abutting edges of acoustic linings shall be sealed with a fire resistant neoprene coating, and exposed edges of acoustic linings shall be installed with sheet metal nosing to prevent erosion.

C. Lining shall not impart odor to the air, delaminate or be loosened by the airstream under normal operating conditions. Lining which is damaged during fabrication or shipment shall not be installed.

D. Supply ductwork downstream of terminal units shall have 1-1/2 in. thick acoustical lining for a minimum of 10 feet. All air outlets shall be installed downstream of this minimum distance.

E. Provide 1-1/2 in. thick acoustical lining for a minimum of 10 feet upstream and downstream of all supply and return fans.

### 3.12 SMOKE DETECTION

A. Smoke detectors shall be furnished by Division 26 "Electrical". This Contractor shall install detectors located in ductwork. Clearly indicate locations of smoke detectors on the sheet metal shop drawings.

B. Increase duct size at smoke detectors, where required for proper installation, per smoke detector manufacturer's recommendations. Coordinate minimum duct size required with Division 26 "Electrical" .

### 3.13 DUCT SEALING

A. Preparation:
   1. Clean surfaces of dirt, oil, grease and loose of foreign matter that could impair adhesion, using soap and water or solvent.
   2. Allow surfaces to dry completely before proceeding.

B. Installation of Sealant System:
   1. Apply sealant system to duct joints, fasteners, and seams in accordance with manufacturer's instructions.
   2. Apply sealant by brush, putty knife or caulk gun, to full coverage. Remove excess adhesive immediately.
   3. Completely seal duct joint, fasteners and seams without voids, to a minimum 20 mil thick wet film.
   4. Apply and store at ambient temperature of 40□F to 100□F; and protect from freezing until dry.

C. Field Quality Control:
   1. Allow duct sealant system to cure a minimum of 72 hours before operating the system.
   2. Do not apply external duct insulation or coatings until the joints have been inspected by the Owner's Representative.

### 3.14 EXHIBIT I - DUCTWORK MATERIALS

| SERVICE | MATERIAL | SPECIAL REQUIREMENTS |
|---|---|---|
| Supply, return, vent, relief, outside and exhaust | Lock forming quality, galvanized steel ASTM A653 and A924, galvaneal/paint grip if not insulated and exposed | Joints and features as called for |
| Locker room exhaust duct systems in their entirety. | Aluminum | Aluminum fasteners |

| | | |
|---|---|---|
| Showers/Drying and as called for on plans | | |
| Accessories, dampers and air turns | Same material and gauge as parent duct | ---------- |

**END OF SECTION 23 31 00**

## SECTION 23 33 13
## FIRE AND SMOKE DAMPERS

### PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.

B. UL 555S - Standard for Smoke Dampers; Current Edition, Including All Revisions.

### 1.02 DESCRIPTION

A. Provide labor, materials, equipment and services required for the complete installation as shown on the Contract Documents.

### 1.03 SUBMITTALS

A. Submit product data, types, schedule of sizes, locations, and installation arrangements of all dampers.

B. Submit manufacturer's UL listed installation details for each mounting arrangement.

### 1.04 QUALIFICATIONS

A. Provide work in compliance with the following Codes and Standards based on the current edition in effect at project location:
   1. Mechanical Code of New York State.
   2. UL 555, UL 555S and UL555C.
      a. Fire dampers shall be Underwriter's Laboratories classified and labeled.
      b. Smoke dampers and operator assemblies shall be Underwriter's Laboratories (UL) classified and labeled as an assembly.

### PART 2 - PRODUCTS

### 2.01 FIRE DAMPERS

A. Curtain type damper of galvanized steel (304 stainless steel for ductwork containing shower room exhaust, wet location exhaust, and corrosive fume exhaust) construction with fusible link, 20 gauge frame and 24 gauge blades. UL listed and labeled.
   1. 100% free area with welded head .
   2. Square, rectangular, round or oval duct connection as required by duct connections.
   3. 1-1/2 hour rated dampers for walls or floors rated less than three hours. Three-hour rated dampers for three and four hour walls or floors.
   4. With factory fabricated sleeve with fixed and slip flanges.
   5. Fusible link temperature rating of 165 F.

B. Design Equipment: Ruskin Model IBD2 Style B.

C. Make: Ruskin, Air Balance, National Controlled Air, Prefco, Venco, Greenheck, Nailor, Pottorff.

### 2.02 SMOKE DAMPERS FOR VELOCITY UP TO 2000 FPM

A. Airfoil multiblade type damper of galvanized steel construction (stainless steel for corrosive fume exhaust) with 16 gauge hat channel frame with corner reinforcement and blades equivalent to 14 gauge, silicone rubber blade edge seals, stainless steel bearings and flexible stainless steel jamb seals. UL listed and labeled.
   1. UL listed120 volt electric motor operator. Operator to be mounted outside of the air stream.
   2. Suitable for installation in duct system with velocities up to 2000 fpm at maximum of 4 in s.p.
   3. Square or rectangle as required. Duct transitions for dampers in round or oval ducts.
   4. With factory fabricated sleeve with fixed and slip flanges.
   5. Class I performance of 4.0 cfm/ft 2 at 1 in. w.g. (8.0 cfm/ft2 at 4 in. w.g.).
   6. Provide with damper position indicator switch package.

B. Design Equipment: Ruskin Model SD37.

C. Make: Ruskin, Air Balance, National Controlled Air, Greenheck, Nailor, Pottorff.

### 2.03 COMBINATION FIRE/SMOKE DAMPERS

A. Airfoil multiblade type damper of galvanized steel construction suitable for installation in high velocity duct systems up to 2000 fpm and 4 in. s.p. with 16 gauge hat channel frame with corner reinforcement and blades equivalent to 14 gauge, silicone rubber blade edge seals, stainless steel bearings and flexible stainless steel jamb seals. UL listed and labeled.
   1. UL listed 120 volt electric motor operator. Operator to be mounted outside of the air stream.
   2. Square, rectangle, or round as required. Duct transitions for dampers in oval ducts.
   3. With factory fabricated sleeve with fixed and slip flanges.
   4. Class I leak rating of 4.0 cfm/ft2 at 1 in. w.g. (8.0 cfm/ft2 at 4 in. w.g.)
   5. 1-1/2 hour fire rated. Fusible link temperature rating of 165□F.
   6. Provide with damper position indicator switch package.

B. Design Equipment: Ruskin FSD60.

C. Make: Ruskin, Air Balance, National Controlled Air, Greenheck, Nailor, Pottorff

## PART 3 - EXECUTION

### 3.01 LOCATIONS

A. Provide fire dampers in all one, two and three hour rated wall and floor penetrations.

B. Provide smoke dampers as called for in penetrations of smoke barriers.

### 3.02 INSTALLATION

A. Dampers shall be installed in accordance with the manufacturer's written instructions and as required to meet specified listings.

B. Provide sleeve, angles, and access doors for installation in accordance with the latest requirements of SMACNA, NFPA, UL and damper manufacturer.

C. Provide sheet metal access doors with labels, as called for in Specification Section 233100 in ductwork for dampers and accessories.

D. Provide ceiling or wall access doors for dampers and accessories.

E. Install dampers square and free from racking.

F. Do not compress or stretch the damper frame into the duct or opening.

G. Provide bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Attach multiple damper section assemblies together in accordance with manufacturer's instructions. Install support mullions as reinforcement between assemblies as required.

H. Division 26 "Electric" will provide signal wiring and power wiring for smoke dampers. Refer to "Building Management System" Section for additional requirements. Smoke detectors shall be furnished by Division 26 "Electric" . Install detectors located in ductwork within 5'-0" of the damper. Increase duct size at smoke detectors, where required for proper installation, per smoke detector manufacturer's recommendations. Coordinate minimum duct size and length for smoke detectors required with Division 26 "Electric" .

I. Provide insulation end seal fittings for double wall ductwork where same connects to damper assembly.

### 3.03 CERTIFICATION

A. Contractor shall certify that dampers are accessible for servicing, are installed properly, and are operational. Submit three (3) copies of signed certification to the Owner's Representative for review.

### 3.04 IDENTIFICATION

A. Provide damper tags and charts.
   1. Fasten tag to ductwork adjacent to the dampers.
   2. Number each damper and make chart listing.
      a. Number.
      b. Location.
      c. Air system in which they are installed.

B. Submit three (3) copies of chart to the Owner's Representative for review.

**END OF SECTION 23 33 13**

**SECTION 23 34 00**
**FANS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.

### 1.02 DESCRIPTION

A. Provide labor, materials, equipment and services as required for the complete installation designed in Contract Drawings.

### 1.03 SUBMITTALS

A. Submit product data for all fans, motors, drives, and accessories. Include all fan curves fan operating point, and sound data.

### 1.04 QUALITY ASSURANCE

A. Capacity, size and arrangement, static pressure, brake horsepower, component parts and accessories shall be provided as called for or scheduled. Guaranteed full capacity delivery through duct systems finally installed and under conditions listed. The manufacturer shall guarantee sound-power level ratings not exceeding those of the design equipment. All equipment shall be statically and dynamically balanced to acceptable tolerances with weights permanently fastened. Fan wheels shall be rebalanced in the field, if necessary.

B. Pressure Classification:

| Maximum Total Sp | Class |
|---|---|
| Up to 3-3/4 in. WG-STD | I |
| Up to 6-3/4 in. WG-STD | II |
| Up to 12-3/4 in. WG-STD | III |

C. Conventional Motors:
   1. Motor sizes shall be as scheduled. Refer to Specification Section 230513 for motor types, efficiency requirements, and acceptable motor manufacturers. All belt-driven fan motors shall be mounted on either an adjustable slide base or a pivoting base.

D. EC Motors:
   1. Motors shall be Electronically Commutated Type (EC), variable speed, DC, brushless motors specifically designed for use with single phase, 277 volt (or 120 volt), 60 hertz electrical input.
   2. Motor shall be complete with and operated by a single-phase integrated controller/inverter that operates the wound stator and senses rotor position to electronically commutate the stator.
   3. Motors shall be designed for synchronous rotation. Motor rotor shall be permanent magnet type with near zero rotor losses. Motor shall have built-in-soft start and soft speed change ramps.
   4. Motor shall be able to be mounted with shaft in horizontal or vertical orientation. Motor shall be permanently lubricated with ball bearings. Motors shall be direct coupled to the blower.
   5. Motor shall maintain a minimum of 85% efficiency over its entire operating range and have a turndown to 20% of full speed, (80% turndown).
   6. Provide manual fan speed output control for field adjustment of the fan airflow setpoint.
   7. Inductors shall be provided to minimize harmonic distortion and line noise.
   8. Provide isolation between fan motor assembly and unit casing to eliminate any vibration from the fan to the terminal unit casing.
   9. Provide a motor that is designed to overcome reverse rotation and not affect life expectancy.
   10. The fan manufacturer shall provide a factory installed PWM controller for either manual or DDC controlled fan CFM adjustment. The manual PWM controller shall be field adjustable

with a standard screwdriver. The remote PWM controller shall be capable of receiving a 0-10 VDC signal from the DDC controller (provided by the controls contractor) to control the fan CFM. When the manual PWM controller is used, the factory shall present the fan CFMs as shown on the schedule.

11. Acceptable Manufacturers: Emerson Ultratech, U.S. Motors-Nidec, GE-ECM, A.O. Smith or equivalent.

E. Drive Systems:
   1. Provide fans with belt or direct drive systems as scheduled. V-belt drives as recommended by drive manufacturer, unless otherwise specified or scheduled.
      a. Size drive for 200% of motor rating when motor is 10 HP and larger. Size for 150% of motor rating when motor is less than 10 HP.
      b. Motors 5 HP and larger shall be provided with a minimum of two (2) belts. All belt sets shall be matched.
      c. Cast iron or cast steel pulleys.
      d. Provide belt and shaft guards for each driven device. Provide openings in both the motor and fan sections of the guard so that the motor and fan speeds can be checked without removing the belt guard.
      e. Belts shall be oil and heat resistant, non-static type.
      f. Drives shall be precision machined cast iron type, keyed and securely attached to the wheel and motor shafts.
      g. All belt drive fan motor selections must include an allowance for medium drive losses as established by AMCA Publication 203.

F. Motor Pulleys:
   1. 5 HP and Smaller: Adjustable type to produce 15% speed change above and below scheduled fan speed. 7-1/2 HP and Larger: Fixed type.
   2. 5 HP and Smaller: "A" section, 2.6 in. minimum pitch diameter.
   3. Drive ratio not over 4:1.

G. Bearings:
   1. Bearings shall be designed and individually tested specifically for use in air handling applications. Construction shall be heavy-duty regreasable ball type in a pillow block cast iron housing selected for a minimum L50 life in excess of 200,000 hours as maximum cataloged operating speed.

H. Wheels and Propellers:
   1. All wheels and propellers shall be balanced in accordance with AMCA Standard 204-96, balance quality and vibration levels for fans. Wheel shall overlap an aerodynamic aluminum inlet cone to provide maximum performance and efficiency.
   2. Blades on all sizes shall be continuously welded to the backplate and deep spun inlet shroud.
   3. All hubs shall be keyed and securely attached to the fan shaft.

I. Blower Shafts:
   1. All blower shafts shall be AISI-C-1045 hot rolled and accurately turned, ground and polished. Shafting shall be sized for a critical speed of at least 125% of maximum cataloged operating speed.

J. Coating:
   1. All steel fan components shall contain an electrostatically applied, baked polyester powder coating. Paint must exceed 1,000 hour salt spray under ASTM B117 test method.

K. Vibration isolation for units shall be furnished by the fan manufacturer unless otherwise noted. Provide rubber in shear type vibration isolators.

L. Certifications:
   1. Fan shall be listed by Underwriters Laboratories (((UL 705))) and UL listed for Canada (CUL 705). Fan shall bear the AMCA certified ratings seal for sound and air performance.

2. All units shall bear an engraved aluminum nameplate and shall be shipped in ISTA certified transit-tested packaging.

## PART 2 - PRODUCTS

### 2.01 ROOF FANS

A. Manufacturers: Subject to compliance with requirements of this section, provide products by one of the following:
   1. Acme, Cook, Greenheck, Twin City, PennBarry.

B. Spun Aluminum Downblast Centrifugal Exhaust Ventilator:
   1. Construction:
      a. The fan shall be bolted and welded construction utilizing corrosion resistant fasteners. The spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure.
      b. The aluminum base shall have continuously welded curb cap corners for maximum leak protection, and shall be tall enough to cover the wood nailer on roof curb.
      c. The discharge baffle shall have a rolled bead for added strength.
      d. An integral conduit chase shall be provided through the curb cap and into the motor compartment to facilitate wiring connections.
      e. Bearings and drives shall be mounted on a minimum 14 gauge steel power assembly, isolated from the unit structure with rubber vibration isolators. These components shall be enclosed in a weather-tight compartment, separated from the exhaust airstream.
      f. Hinged at curb so that entire fan can be tilted upward for maintenance, access to dampers, and access to damper motor.
      g. 1/2 in. x 1/2 in. aluminum wire mesh bird screen.
   2. Wheel:
      a. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub.
   3. Accessories:
      a. Backdraft Damper - Motorized.
      b. Roof Curb - In accordance with Section 230530.
      c. Disconnect Switch - Factory wired and mounted.
      d. Fan Speed Controller (For Direct Drive Models Only) - Factory wired and mounted.
   4. Basis-of-Design: Product indicated in schedule.

### 2.02 CONTROL (MOTORIZED) DAMPERS

A. Manufacturers: Subject to compliance with requirements of this section, provide products by one of the following:
   1. Ruskin, Tamco, Greenheck.

B. Provide control dampers as shown on the drawings and diagrams, to meet the following minimum construction standards:
   1. Leakage: Class 1, 4 CFM/sq. ft. at 1 in. w.c., tested per AMCA Standard 500-D-98, and AMCA Standard 500-D-98, and AMCA Standard 511 and bearing AMCA's Certified Ratings for both air performance and air leakage.
   2. Frame: 16 gauge galvanized steel structural hat channel with tabbed corners for reinforcement to meet 13 gauge criteria.
   3. Blades: 14 gauge (equivalent thickness galvanized steel) roll forward air foil type for low pressure drop and low noise generation. Blades shall be parallel for two-position dampers and opposed, for modulating dampers.
   4. Blade Seals: Ruskiprene, suitable for -72°F to 275°F mechanically locked into the blade edge.
   5. Jamb Seals: Flexible metal compression type.

6. Blade Axles: 1/2 in. plated steel hexagonal positively locked into the damper blade. Linkage concealed out of the airstream.
7. Bearings: Corrosion resistant, permanently lubricated stainless steel sleeve.
8. Dampers subject to corrosive fumes or humidity shall be constructed of stainless steel.
9. Dampers over 48 in. in length and height shall be made in multiple sections.
10. Where damper sizes are not specifically indicated, they shall be sized by the Contractor. Maximum velocity shall be 1500 FPM and maximum pressure drop 0.1 in. w.g.
11. Where shown or required for proof of closure or open position, provide factory installed damper positioning switch package Ruskin Model SP-100.
12. Dampers shall be as manufactured by Ruskin CD 60 control damper, or equivalent Tamco, Greenheck or Nailor.
13. Basis of Design: Ruskin CD60.

## PART 3 - EXECUTION

### 3.01 INSTALLATION OF EQUIPMENT

A. Provide equipment in accordance with manufacturer's instructions. All fans shall meet the intent of the system performance requirements. Provide rubber in-shear vibration isolation for all fans unless otherwise called for. Provide necessary support steel for equipment. Provide guards for all exposed belts, shafts, and fan wheels. Change pulley sizes or adjust sheaves as required to make systems deliver specified quantities of air as listed on the Contract Drawings.

**END OF SECTION 23 34 00**

**SECTION 23 36 00**
**VARIABLE VOLUME TERMINAL UNITS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

B. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

C. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.

### 1.02 DESCRIPTION

A. Provide labor, materials, equipment and services as required for the complete installation as shown on the Contract Drawings.

### 1.03 SUBMITTALS

A. Submit product data for terminal units including room number, maximum and minimum CFM, accessories, pressure drops, discharge and sound power data by octave band. Clearly indicate box sizes being proposed.

## PART 2 - PRODUCTS

### 2.01 TERMINAL UNITS

A. General Unit Construction:
   1. Unit casing shall be constructed of 22 gauge welded galvanized steel. Factory label each unit with size, location, minimum and maximum CFM, and calibration chart. Air terminal units shall be capable of operating at 10 in. w.g., pressure maximum without damage. Maximum casing leakage at 3 in. W.G. shall be 11 cfm.
   2. Unit insulation liner shall comply with the requirements of UL 181 (erosion, mold growth and humidity) and ASHRAE 62.1, and shall have a maximum flame/smoke spread of 25/50 for both the insulation and the adhesive when tested in accordance with ASTM E84. Insulation shall be secured with adhesive. Liner shall be:
      a. Fiberglass insulation 1 in. thick (R4.1); insulation edges exposed to the airstream shall be coated with NFPA 90A approved sealant.
   3. Units to be certified under ARI Standard 880-94 Certification Program and carry ARI seal.
   4. Units to be provided with a factory control enclosure suitable for field installed controls.
   5. Units shall be provided with factory access door option.

B. Control and Volume Regulating Devices:
   1. Internal unit damper shall be constructed of galvanized steel with blade-end seals for tight shut-off with a maximum damper leakage of 7 CFM against a maximum of 3 in. w.g. Damper shall be mounted on a galvanized steel shaft extending through the unit on torque free bearings. Terminal shall have normally open dampers.
      a. Minimum and maximum air quantities shall be factory set, but may be field adjustable. Neither the radiated or discharge sound power levels shall exceed the ratings of design equipment as scheduled on the Contract Drawings.

C. Electric Resistance Reheat Coil:
   1. Coil shall be factory installed on the terminal unit utilizing drive slip joints. UL listed and meeting all NEC requirements. Primary and secondary over-temperature protection. Minimum airflow interlock switch. Two-stage coil with unit mounted disconnect, contactors, power and control terminal blocks. Capacity, volts, phase and controls as called for.

D. Terminal Volume Controller (Electronic):
   1. Provide unit with airflow velocity and total pressure sensor suitable for use up to 3000 fpm velocity. Sensors shall be averaging type with multiple sampling points on cross grids.

Electronic controller shall be pressure independent and shall modulate airflow in response to space temperature. Damper actuator shall be worm gear drive, electronic type, with built-in limit switches and adjustable minimum and maximum stops. Unit shall be provided with 120 V/24 V, single phase transformer for powering controller. The entire controller shall be prewired. 7-day programable wall mounted thermostat.

E. Design Equipment: Titus EESV

F. Acceptable Makes: Anemostat, Carrier, Envirotech, Krueger, Nailor, Price, Titus, Tuttle and Bailey, Trane

**PART 3 - EXECUTION**

**3.01 GENERAL REQUIREMENTS**

A. Suspended terminal units from the building structural system independent of the ceiling, ductwork and piping systems. If this cannot be accomplished, provide additional intermediate angle iron from which the units shall be suspended. Level each unit.

B. Access to the terminal unit controls shall be accomplished by removal of ceiling panels or through an access door. Coordinate locations of access doors.

**END OF SECTION 23 36 00**

## SECTION 23 37 13
## REGISTERS AND DIFFUSERS

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services required for the complete installation designed in Contract Documents.

### 1.02 SUBMITTALS

A. Registers/Grilles/Diffusers: Submit product data including room schedule listing size, CFM, throw, direction of throw, accessories, finish, material type, color chart, pressure drop and noise criteria.

### 1.03 GENERAL REQUIREMENTS

A. Each manufacturer shall check noise level ratings for registers and diffusers to insure that the sizes selected will not produce noise to exceed N.C. - 24, measured at occupant level; notify Owner's Representative of problems prior to submittal.

B. Pressure drop, airflow and noise criteria selection is based on design equipment. Manufacturers not submitting design makes must provide written certification in front of submittal that equipment submitted has been checked against and performs equal to the design make.

C. Borders and frames shall be coordinated with materials and ceiling systems to integrate with architectural ceiling details and finishes scheduled.

D. Locations of ceiling mounted air terminal devices shall be coordinated with locations shown on architectural reflected ceiling plans.

E. 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. 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.

### 1.04 REQUIREMENTS FOR REGISTERS

A. General:
   1. A register is defined as a grille plus a volume damper.
   2. Registers shall be installed "sight-proof" where possible, i.e.: High wall register with horizontal blades inclined up, or along a wall with blades facing the wall.
   3. Borders and frames shall be of the same material as register face unless specified otherwise.

B. Mounting Frames:
   1. Provide with screw holes in register face punched and countersunk at factory, and mounting frame drilled and tapped to suit. Sponge rubber gasket between frame and wall or ceiling for all surface mounted frames.
   2. Frame shall be overlap type and shall be suitable for type of ceiling where register is to be installed.

C. Finishes:
   1. Baked enamel (of colors as selected from the manufacturer's standard color chart) etched and lacquer, natural anodized, as scheduled.

D. Design Equipment: Titus unless otherwise noted.

E. Manufacturers: Anemostat, Carnes, Krueger, Titus, Price, Tuttle and Bailey, Nailor.

### 1.05 REQUIREMENTS FOR DIFFUSERS

A. General:

1. Provide four way blow unless otherwise noted.
2. Where manufacturer's size recommendations require duct sizes or connections differing from design, Contractor shall provide at no change in contract price.
3. Suitable for recessed mounting unless otherwise indicated.
4. Provide square to round neck transitions as required.
5. Provide sponge rubber gasket for all surface mounted frames.

B. Finishes:
1. Baked enamel (of colors as selected from the manufacturer's standard color chart) etched and lacquer, natural anodized, as scheduled.

C. Frame style shall be suitable for ceiling type in which diffuser is to be installed.

D. Design Equipment: Titus unless otherwise noted.

E. Manufacturers: Anemostat, Carnes, Krueger, Titus, Price, Tuttle and Bailey, Nailor.

## PART 2 - PRODUCTS

### 2.01 SUPPLY TYPES

A. Type 1 - (Smooth Face Type):
1. Steel construction with 22 gauge back pan and 22 gauge face panel with rolled edges that finishes flush with ceiling system.
2. Round neck - minimum 1-1/4 in. collar for duct connection.
3. Frame suitable for ceiling type.
4. With optional directional air flow pattern controllers that are concealed behind the face or in the neck.
5. Face panel shall be removed and securely held in place to the back pan without noise or vibration.
6. Horizontal airflow pattern.
7. Panel Size: 24 in. x 24 in.
8. Model: Titus OMNI.

B. Type 2 - (Supply Air Grille):
1. Steel 20 gauge frame construction with double deflection capability and the front blades shall be parallel to the short dimension. Solid extruded aluminum air foil blades mounted in friction pivots for individual blade adjustment, spaced on 3/4 in. centers.
2. Unit curved to allow inset into round ductwork. Unit provided with seal.
3. Key operated opposed blade damper.
4. 1-1/4 in. wide flange with sponge rubber gasket.
5. Model: Titus S301FL.

### 2.02 RETURN/EXHAUST TYPES

A. Type A - (Exhaust and Return Registers):
1. Steel construction with 22 gauge frame and blades, with horizontal bars on a 3/4 in. spacing set at 35□ fixed deflection.
2. Key operated opposed blade damper.
3. 1-1/4 in. wide flange.
4. The blades shall be parallel to long] dimension.
5. Model: Titus 350-RL.

B. Type B - (Aluminum Exhaust and Return Register):
1. Aluminum construction with horizontal blades on a 3/4 in. spacing and set at 35□ fixed deflection.
2. Key operated opposed blade damper.
3. 1-1/4 in. wide border with minimum thickness of .040 - .050 in. interlocked at all four corners and mechanically fastened.
4. The blades shall be parallel to long dimension.
5. Model: Titus 350-FL.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Install equipment in strict accordance with manufacturer's instructions. Rough in or install per reflected ceiling plan or in location instructed by Owner's Representative.

B. Provide approved air extractors behind all duct mounted supply registers in exposed ductwork.

C. When the final connection to an exhaust or return grille is made, a 12 in. minimum height plenum box must be supplied to all grilles. Plenum dimensions shall match grille size. Paint inside of plenum box flat black. Provide 1 in. acoustical lining in plenum box. Oversize the plenum to account for the thickness of the lining.

D. Seal all supply and return registers, grilles and diffusers during construction operations to limit dust entering HVAC systems and ductwork. Seals may be removed just prior to testing and balancing, but not without the approval of the Owner's Representative.

**END OF SECTION 23 37 13**

**SECTION 23 81 26.11**
**DUCTLESS SPLIT SYSTEM AIR CONDITIONER**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide all labor, materials, equipment and services as required for the complete installation designed in Contract Documents.

### 1.02 SUBMITTALS

A. Submit product data for split system ductless air conditioner, including condensing unit, refrigerant piping diagrams, and control and wiring schematics.

### 1.03 GENERAL REQUIREMENTS

A. Provide units to fit intended use and location as indicated:
   1. Capacity, size and arrangement, component parts and accessories as scheduled and/or as necessary to obtain required results and allow for proper maintenance.
   2. Unit capacities to be ARI 210 rated.
   3. Unit to meet or exceed minimum SEER Requirements of New York State Energy Code and Department of Energy (DOE).

## PART 2 - PRODUCTS

### 2.01 AIR HANDLING UNIT(WALL MOUNTED TYPE)

A. Units shall be completely factory assembled including coil, condensate drain pan, fan, motor, filters and controls in an insulated casing. Units shall be UL listed and C.S.A. certified. Forward curved, dynamically and statically balanced fan with 3 speed direct drive. Fan motor bearing shall be permanently lubricated.

B. Units shall have sheet metal and steel frame construction and shall be painted with an enamel finish. Casing shall be insulated and knockouts shall be provided for electrical power and control wiring.

C. Unit shall have a single refrigerant circuit controlled by a flow control check valve (FCCV). Aluminum fin surface shall be mechanically bonded to 3/8 in. OD copper tubing. Coils shall be factory pressure and leak tested.

### 2.02 CONDENSING UNIT

A. The condensing unit shall be fully charged from the factory for up to 100 ft. of piping. The unit must be designed to operate at outdoor ambient temperatures as high as 115□F and as low as -20□F, with low-ambient kit. The unit shall be UL listed. Unit casing shall be constructed of heavy gauge, galvanized steel and painted with a weather-resistant powder paint finish.

B. Refrigeration system controls include condenser fan and compressor contactor. High and low pressure controls shall be inherent to the compressor. A factory installed liquid line dryer shall be standard. The compressor shall feature internal over temperature and pressure protection, total epoxy dipped hermetic motor windings, thermostatically controlled sump heater, centrifugal oil pump, and internal spring mounts to reduce vibration and noise. The coil shall be continuously wrapped, corrosion resistant all aluminum glued with minimized brazed joints. The coil shall be 3/8 in. O.D. seamless aluminum glued to a continuous aluminum fin. The coil shall be protected on all four sides by louvered panels.

### 2.03 ACCESSORIES

A. Wall Mounted Microprocessor Controller:
   1. Liquid crystal digital display indicating: Operating mode, setpoint temperature, room temperature, timer setting, fan speed and airflow direction.
   2. Self diagnostic fault indication.
   3. 24 hour on-off timer.
   4. Previous setpoint memory feature.

B. Low ambient protection kit with wind baffle. Allow unit operation down to -20□F.

C. Auto restart following power failure.

D. Pre-charged uninsulated refrigerant piping lines.

**2.04 DESIGN EQUIPMENT**

A. Per Schedule.

**2.05 ACCEPTABLE MAKE**

A. Sanyo, Mitsubishi, EMI, Carrier.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

A. Install equipment in strict accordance with manufacturer's instructions and so as to be compatible with intent of the respective system performance requirements.

B. Connect condensate to piping left by Plumbing Contractor.

C. Provide refrigerant piping and control wiring.

D. Provide any and all necessary control wiring

**END OF SECTION 23 81 26.11**

**SECTION 23 81 43**
**PACKAGED ROOFTOP HEAT PUMP UNIT**

## PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation and related Work as required in Contract Documents.

### 1.02 SUBMITTALS

A. Submit product data for packaged rooftop unit and accessories.

B. Submit Installation details.

C. Submit complete installation drawings, installation and start-up instructions, wiring diagrams and instruction manuals from manufacturer of equipment.

### 1.03 QUALIFICATIONS

A. Shall comply with New York State Energy Conservation Construction Code and ARI Standard 240.

B. Unit shall have UL label.

### 1.04 MANUFACTURER'S WARRANTY

A. Sixty months extended warranty for refrigerant system.

## PART 2 - PRODUCTS

### 2.01 PACKAGED ROOFTOP HEAT PUMP UNIT

A. General:
   1. Provide a complete packaged rooftop unit including fans, compressors, coils, piping and controls. Factory assembled, piped, internally wired, and fully charged with refrigerant and ready to operate.
   2. Unit cabinet constructed of galvanized steel, bonderized and coated with a baked enamel finish.
   3. Cabinet interior insulated with 1 in. thick neoprene coated fiberglass. The airstream side of the insulation shall have strong smooth mat integrally laminated to the insulation.
   4. Removable panels for service to operating components.
   5. Suitable unit mounted disconnect and electrical cabinet with starter, auxiliary contracts, power and control terminal blocks and devices. Enclosure in compliance with NEMA 3R requirements. Provide additional auxiliary contacts for fire alarm fan shutdown.

B. Fan Section:
   1. Complete with forward or backward curved fans as called for, motor, belts, guards and pulleys.
   2. Number and diameter of fans and discharge arrangement as called for.
   3. Adjustable pitch motor pulleys. Fan bearings shall be rated for 50,000 hours B-10 life continuous operation in accordance with AFBMA.
   4. Bearing mounting adjustable and self-aligning.
   5. Motor mounted on adjustable pivoted or slide base.
   6. Fan and motor mounted on a vibration isolated steel frame.

C. Electric Heating Coil:
   1. Element of 80% nickel, 20% chromium, coiled resistance wire.
   2. Supported with reinforcing brackets.
   3. Bracket bushings and terminal insulators securely positioned and made of high-grade ceramic.
   4. Disc type automatic reset thermal cut out with manual reset.
   5. Fused control transformer.
   6. Air proving switch to de-energize the coil when insufficient air flow occurs.

7. Magnetic staging contactors to control the coil elements.
8. Control and power voltage terminal blocks, factory wired to single unit terminal block.
9. Coil and fusing to meet UL and NEC requirements, UL listed.
10. Capacity as called for.

D. DX Cooling Coil Section:
1. Drip pan with corrosion-resistant mastic coating with drain connection.
2. Capacity as called for.
3. Direct expansion type, ARI rated.
4. Coils designed and tested in accordance with ANSI B9.1.
5. Seamless copper tubing and aluminum fins. Fins of ripple design without a hooked trailing edge.
6. Thermal expansion valve proper for refrigerant used.

E. Compressor Condenser Section:
1. Unit compressors of serviceable semi-hermetic or welded, fully hermetic design with crankcase heaters and vibration isolators.
2. Protect cooling system with high pressurestat, low pressurestat, loss of charge protection, indoor coil freezestats, and current and temperature sensitive overload devices.
3. Circuit to prevent compressor short cycling as a result of a rapid change in thermostat setting and to automatically prevent compressor restart as least five minutes after shutdown.
4. Protective devices wired through the control circuit to prevent compressor restart until reset.
5. Defrost control shall prevent frost accumulation during heating cycle by switching outdoor section to temper air during defrost cycle.
6. Head pressure control on outdoor fan to maintain control down to -20° on heating and cooling cycles.
7. Propeller type up-blow, outdoor fan, with direct driven permanently lubricated motor.
8. Condenser coil, ARI rated, designed and tested in compliance with ANSI B9.1. Seamless copper tubing and aluminum fins.

F. Packaged Controls.
1. Remote panel to provide central control of heating, cooling, fans and damper. Seven-day timeclock with ten-hour spring wound carryover shall schedule occupied/unoccupied periods for reduced night heating temperatures. Panel to include indicator lights for unit functions.
2. Economizer shall include return air, relief air and outside air dampers and operators. Modulating electric control system and enthalpy changeover control and mixed air thermostat with adjustable setpoint. Economizer control shall be capable of introducing up to 100% outdoor air. The control changeover from mechanical cooling to economizer operation shall be automatic through an adjustable enthalpy control device.
3. Power exhaust relief shall be used in conjunction with economizer and shall operate whenever the unit draws more than 25% outside air.
4. Remote panel shall provide staged heating and cooling, automatic and manual changeover and fan control.
5. Warm-up thermostat located in the return airstream shall prevent introduction of outside air until warm-up cycle is completed.
6. Unit shall maintain temperature setpoint in the supply airstream.
7. Provide control items compatible with temperature control sequences as called for.
8. Provide unit with full standalone controller for Variable air volume with constant temperature controller connected to all system vav box controllers. Fan shall modulate to maintain duct static pressure setpoint. Unit shall be provided with all sensors required for this operation.

G. Design Equipment: Per Schedule.

H. Make: Carrier, Daikin Applied, Trane, York, or approved equal.

## PART 3 - EXECUTION

### 3.01 PACKAGED ROOFTOP HEAT PUMP UNIT

A. Provide for roof openings and framing as called for. Set and secure curb to roof and unit to curb.

B. Shim roof curb level. Pipe coil drains to spill to roof, provide trap of proper depth.

C. Provide unit in strict accordance with manufacturer's instructions.

D. Coordinate installation with work as part of "Control Systems" Section.

E. Start-Up:

1. Arrange to have equipment manufacturer's technician to verify installation for compliance with manufacturer's recommendations.
2. Arrange to have equipment manufacturer's technician to perform start-up of equipment, instruct Owner's Representative in the proper operation of the equipment.

**END OF SECTION 23 81 43**

## SECTION 23 82 39
## UNIT HEATERS AND CABINET UNIT HEATERS (HYDRONIC AND ELECTRIC)

### PART 1 - GENERAL

### 1.01 DESCRIPTION

A. Provide labor, materials, equipment and services as required for the complete installation and related work as shown on the Contract Documents.

### 1.02 SUBMITTALS

A. Submit product data for unit heaters and cabinet unit heaters.

### PART 2 - PRODUCTS

### 2.01 GENERAL REQUIREMENTS

A. Free from expansion and contraction noises and strains. Fan speed shown on Schedule shall not be exceeded. Each piece of equipment shall be factory-boxed and tagged by room number. Cabinet unit heaters and unit heaters shall have baked enamel finish with color selected by the Architect from manufacturer's standard colors. Rating in accordance with standard test codes adopted jointly by IUGA and ASHRAE.

### 2.02 UNIT HEATERS

A. General:
   1. Wall hung or ceiling suspended.
   2. Access for servicing the heating element, motors, and controls.
   3. Horizontal discharge units with adjustable horizontal and/or vertical outlet vanes.
   4. Vertical units with adjustable outlet louvers or diffusers.

B. Fan and Motor:
   1. Statically and dynamically balanced.
   2. Motor shall be totally enclosed and designed for continuous operation. Lubrication shall be sealed-in, permanent type.

C. Heating Element (Electric):
   1. Nickel-chrome wire embedded in refractory encased in steel sheath with spiral wound steel fins.
   2. Each element protected form overheating with high temperature limit switch of automatic reset, snap-action thermostat type.
   3. Supporting brackets attached to back to provide longitudinal movement for expansion and contraction.
   4. Magnetic contactors and other control devices to operate at 120 volt line voltage. Include manual disconnect switch, and transformer to provide 120 volt for controls and if necessary, for fan motor.
   5. Fan delay switch to dissipate coil heat after element de-energized.

D. Control Accessories:
   1. Wall mounted line voltage thermostat. Self-learning, setback capable thermostat, with motion sensor; design based on TPI SDHW1001 (or equal).

E. Electric:
   1. Design Equipment: Q-Mark.
   2. Acceptable Makes: Berko, Markel, Q-Mark.

### 2.03 CABINET UNIT HEATERS

A. General:
   1. Rough-in dimensions must not exceed those of design equipment.

B. Cabinet:
   1. Front and exposed parts, 16-gauge furniture steel, all others, 18 gauge steel.
   2. Fronts shall be removable for access to interior parts.

3. Recessed or semi-recessed equipment to have four-side overlap, trim strips not acceptable.

C. Fan And Motor:
   1. Fans, forward curved, centrifugal type, direct drive from motor shafts.
   2. Driven by totally enclosed motor with overload protection and lifetime lubrication.
      a. Integral manual motor starter.
   3. Shall be quiet in operation, not to exceed 45 db measured 5 ft. away, at high speed.
   4. Permanent filter.
   5. Key lock control access door(s).

D. Heating Element (Electric):
   1. Nickel-chrome steel resistance wire embedded in refractory enclosed in steel sheath with spiral wound fins.
   2. High limit automatic reset cutout switch wired in series with each element to protect from overheating and located in discharge airstream.
   3. Fan delay switch to keep fan in operation until heat in element is dissipated after element is de-energized.
   4. Built-in transformer to convert line voltage current to fan, and control voltage if different from line voltage.

E. Control Accessories:
   1. Wall mounted line voltage thermostat. Self-learning, setback capable thermostat, with motion sensor; design based on TPI SDHW1001 (or equal).
   2. Unit mount fan speed switch.

F. Electric:
   1. Design Equipment: Q-Mark.
   2. Make: Berko, Markel, Q-Mark

## PART 3 - EXECUTION

### 3.01 INSTALLATION - GENERAL

A. Provide equipment in accordance with manufacturer's printed instructions. Report untrue walls before installation. Report cases where clearance below suspended heaters is less than 7-1/2 ft. Provide clearance for piping or conduit. Support units independent of piping or conduit. Support units from building structure, with screws or bolts; no nailing allowed.

B. Be responsible for proper location and size of recesses. Coordinate installation of recessed or semi-recessed equipment in recesses. Provide framing in recess and shims. Use sponge rubber gasket air-seal between front enclosure and wall.

**END OF SECTION 23 82 39**

## SECTION 26 05 00
## BASIC ELECTRICAL REQUIREMENTS

### PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

B. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.02 WORK INCLUDED

A. Provide all labor, tools, materials, accessories, parts, transportation, taxes, and related items, essential for installation of the work and necessary to make work, complete, and operational. Provide new equipment and material unless otherwise called for. References to codes, specifications and standards called for in the specification sections and on the drawings mean, the latest edition, amendment and revision of such referenced standard in effect on the date of these contract documents. All materials and equipment shall be installed in accordance with the manufacturer's recommendations.

### 1.03 LICENSING

A. The Contractor shall hold a license to perform the work as issued by the authority having jurisdiction.

B. [Plumbing contract work shall be performed by, or under, the direct supervision of a licensed master plumber.]

C. [Electrical contract work shall be performed by, or under, the direct supervision of a licensed electrician.]

### 1.04 PERMITS

A. Apply for and obtain all required permits and inspections, pay all fees and charges including all service charges. Provide certificate of approval from the Authorities Having Jurisdiction prior to request for final payment.

B. Provide electrical inspection certificate of approval from Middle Department Inspection Agency, Commonwealth Inspection Agency, or an Engineer approved Inspection Agency prior to request for final payment.

### 1.05 CODE COMPLIANCE

A. Provide work in compliance with the following Codes and Standards based on the current edition in effect at project location:
   1. Building, Code of New York State.
   2. Existing Building Code of New York State.
   3. Fire Code of New York State.
   4. Plumbing Code of New York State.
   5. Mechanical Code of New York State.
   6. Fuel Gas Code of New York State.
   7. Property Maintenance Code of New York State.
   8. Energy Conservation Code of New York State
   9. Accessible and Usable Buildings and Facilities, ICC A117.1.
   10. New York State Department of Labor Rules and Regulations.
   11. New York State Department of Health.
   12. National Electrical Code (NEC).
   13. Occupational Safety and Health Administration (OSHA).
   14. Local Codes and Ordinances.
   15. Life Safety Code, NFPA 101.
   16. City of [Albany] [Buffalo] [Ithaca] [Syracuse] Plumbing Department.

## 1.06 GLOSSARY

| | |
|---|---|
| ACI | American Concrete Institute |
| AGA | American Gas Association |
| AGCA | Associated General Contractors of America, Inc. |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AFBMA | Anti-Friction Bearing Manufacturer's Association |
| AMCA | Air Moving and Conditioning Association, Inc. |
| ANSI | American National Standards Institute |
| ARI | Air Conditioning and Refrigeration Institute |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. |
| ASME | American Society of Mechanical Engineers |
| ASPE | American Society of Plumbing Engineers |
| ASTM | American Society for Testing Materials |
| AWSC | American Welding Society Code |
| AWWA | American Water Works Association |
| FM | Factory Mutual Insurance Company |
| IBR | Institute of Boiler & Radiation Manufacturers |
| IEEE | Institute of Electrical and Electronics Engineers |
| IRI | Industrial Risk Insurers |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturer's Association |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NYS/DEC | New York State Department of Environmental Conservation |
| SBI | Steel Boiler Institute |
| SMACNA | Sheet Metal and Air Conditioning Contractors National Association |
| UFPO | Underground Facilities Protective Organization |
| UL | Underwriter's Laboratories, Inc. |
| OSHA | Occupational Safety and Health Administration |
| XL - GAP | XL Global Asset Protection Services |

## 1.07 DEFINITIONS

| | |
|---|---|
| Acceptance | Owner acceptance of the project from Contractor upon certification by Owner's Representative. |
| As Specified | Materials, equipment including the execution specified/shown in the contract documents. |
| Basis of Design | Equipment, materials, installation, etc. on which the design is based. (Refer to the article, Equipment Arrangements, and the article, Substitutions.) |
| Code Requirements | Minimum requirements. |
| Concealed | Work installed in pipe and duct shafts, chases or recesses, inside walls, above ceilings, in slabs or below grade. |
| Coordination Drawings | Show the relationship and integration of different construction elements and trades that require careful coordination during fabrication or installation, to fit in the space provided or to function as intended. |
| Delegated-Design Services | Performance and Design criteria for Contractor |

| | |
|---|---|
| | provided professional services. Where professional design services or certifications by a design professional are specifically required of a Contractor, by the Contract Documents. Provide products and systems with the specific design criteria indicated.<br><br>If criteria indicated is insufficient to perform services or certification required, submit a written request for additional information to the Engineer.<br><br>Submit wet signed and sealed certification by the licensed design professional for each product and system specifically assigned to the Contractor to be designed or certified by a design professional.<br><br>Examples: structural maintenance ladders, stairs and platforms, pipe anchors, seismic compliant system, wind, structural supports for material equipment, sprinkler hydraulic calculations. |
| Equal, Equivalent, Equal To, Equivalent To, As Directed and As Required | Shall all be interpreted and should be taken to mean "to the satisfaction of the Engineer". |
| Exposed | Work not identified as concealed. |
| Extract | Carefully dismantle and store where directed by Owner's Representative and/or reinstall as indicated on drawings or as described in specifications. |
| Furnish | Purchase and deliver to job site, location as directed by the Owner's Representative. |
| Inspection | Visual observations by Owner's site Representative. |
| Install | Store at job site if required, proper placement within building construction including miscellaneous items needed to affect placement as required and protect during construction. Take responsibility to mount, connect, start-up and make fully functional. |
| Labeled | Refers to classification by a standards agency. |
| Manufacturers | Refer to the article, Equipment Arrangements, and the article, Substitutions. |
| Prime Professional | Architect or Engineer having a contract directly with the Owner for professional services. |
| Product Data | Illustrations, standard schedules, performance charts, instructions, brochures, wiring diagrams, finishes, or other information furnished by the Contractor to illustrate materials or equipment for some portion of the work. |
| Provide (Furnish and Install) | Contractor shall furnish all labor, materials, equipment and supplies necessary to install and place in operating condition, unless otherwise specifically stated. |
| Relocate | Disassemble, disconnect, and transport equipment to new locations, then clean, test, and install ready for use. |
| Remove | Dismantle and take away from premises without added cost to Owner, and dispose of in a legal manner. |

| | |
|---|---|
| Review and Reviewed | Should be taken to mean to be followed by "for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents". |
| Roughing | Pipe, duct, conduit, equipment layout and installation. |
| Samples | Physical full scale examples which illustrate materials, finishes, coatings, equipment or workmanship, and establishes standards by which work will be judged. |
| Satisfactory | As specified in contract documents. |
| Shop Drawings | Fabrication drawings, diagrams, schedules and other instruments, specifically prepared for the work by the Contractor or a Sub-contractor, manufacturer, supplier or distributor to illustrate some portion of the work. |
| Site Representative | Owner's Inspector or "Clerk of Works" at the work site. |
| Submittals Defined (Technical) | Any item required to be delivered to the Engineer for review as requirement of the Contract Documents.<br><br>The purpose of technical submittals is to demonstrate for those portions of the work for which a submittal is required, the manner in which the Contractor proposes to conform to the information given and design concepts expressed and required by the Contract Documents. |

**1.08 EXISTING CONDITIONS**

A. Contractor shall review all available record documents of existing construction or other existing conditions and hazardous material information. Owner does not guarantee that existing conditions are the same as those indicated in these documents. Contractor shall record existing conditions via measured drawings and preconstruction photographs or video. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage, removal or construction operations.

B. Owner will occupy portions of the building immediately adjacent to the area(s) of removals. Conduct removals so Owner's operations are not disrupted. Contractor shall locate, identify, disconnect and seal or cap mechanical, plumbing, fire protection and/or electrical systems serving areas of removals, unless noted otherwise in the contract documents. Contractor shall arrange shut-down of systems with the Owner. Piping and ductwork indicated to be removed shall be removed and capped or plugged with compatible materials. If services/systems are required to be removed, relocated or abandoned, provide temporary services/systems the bypass area(s) of removals to maintain continuity of services/systems to other parts of the building, as required.

**1.09 SHOP DRAWINGS/PRODUCT DATA/SAMPLES**

A. Provide submittals on all items of equipment and materials to be furnished and installed. Submittals shall be accompanied by a transmittal letter, stating name of project and contractor, name of vendor supplying equipment, number of drawings, titles, specification sections (name and number) and other pertinent data called for in individual sections. Submittals shall have individual cover sheets that shall be dated and contain: Name of project; name of prime professional; name of prime contractor; description or names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. Individual piecemeal or incomplete submittals will not be accepted. Similar items, (all types specified) shall be submitted at under one cover sheet per specification section (e.g. lighting fixtures, valves, plumbing fixtures, etc.). Submittals shall include all required documentation for each product listed in the specification section at the same time as a complete package. Number each submittal by trade. Indicate deviations from contract requirements on Letter of Transmittal. Submittals will be given a general review only. Corrections or comments made on the Submittals during the review do not relieve Contractor from compliance with requirements of the drawings and specifications. The Contractor is responsible for: confirming and correcting all quantities; checking electrical characteristics 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. If submitting hard copies, submit four (4) copies for review.

B. [The Engineer will review up to two (2) submissions of any single submittal. The Contractor will be invoiced on an hourly rate basis for the time spent reviewing the same shop drawing in excess of twice.]

C. If submittals are to be submitted electronically, all requirements in Item A apply. Submittals shall be emailed in PDF format to specific email address provided by the Construction Manager, General Contractor, Architect or Project Manager. Name of project shall be in subject line of email. Send emails to [mealbasubmittalclerk@meengineering.com]

D. Refer to Division 01 for additional requirements.

**1.10 PROTECTION OF PERSONS AND PROPERTY**

A. Contractor shall assume responsibility for construction safety at all times and provide, as part of contract, all trench or building shoring, scaffolding, shielding, dust/fume protection, mechanical/electrical protection, special grounding, safety railings, barriers, and other safety feature required to provide safe conditions for all workmen and site visitors.

**1.11 EQUIPMENT ARRANGEMENTS**

A. The contract documents are prepared using one manufacturer as the Basis of Design, even though other manufacturers' names are listed. If Contractor elects to use one of the listed manufacturers other than Basis of Design or if the physical size, performance or electrical characteristics for the Basis of Design equipment differs from what is indicated in the contract documents, submit detailed drawings, indicating proposed installation of equipment. Show maintenance clearances, service removal space required, and other pertinent revisions to the design arrangement. Make required changes in the work of other trades, at no increase in any contract. Provide larger motors, feeders, breakers, and equipment, additional control devices, valves, fittings and other miscellaneous equipment required for proper operation, and assume responsibility for proper location of roughing and connections by other trades. Remove and replace doorframes, access doors, walls, ceilings, or floors required to install. If revised arrangement submittal is rejected, revise and resubmit specified Basis of Design item which conforms to Contract Documents.

**1.12 SUBSTITUTIONS**

A. If Contractor desires to bid on any other kind, type, brand, or manufacture of material or equipment than those named in specifications, secure prior approval. To request such approval, Contractor shall submit complete information comparing (item-for-item) material or equipment offered with design material or equipment. Include sufficient information to permit quick and thorough comparison, and include performance curves on same basis, capacities, power requirements, controls, materials, metal gauges, finishes, dimensions, weights, etc., of major parts. If accepted, an addendum will be issued to this effect ahead of bid date. Unless such addendum is issued, substitution offered may not be used.

B. Refer to Division 01 for additional requirements.

**1.13 UTILITY COMPANY SERVICES**

A. Division 26 shall make arrangements with local utility company for electric service to the Owner's distribution equipment. Provide underground or overhead electric service as called for and transformers, meter sockets or meter compartments as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the electric service shall comply with the published Utility Company standards. [PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.]

B. Division 22 shall make arrangements with local utility company for gas service to the Owner's distribution system. Provide service to the building as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the gas service shall comply with the published Utility Company standards. [PAY ALL UTILITY

COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.]

## 1.14 ROUGHING

A. The Contract Drawings have been prepared in order to convey design intent and are diagrammatic only. Drawings shall not be interpreted to be fully coordinated for construction.

B. Due to small scale of Drawings, it is not possible to indicate all offsets, fittings, changes in elevation, interferences, etc. Make necessary changes in contract work, equipment locations, etc., as part of a contract to accommodate work to avoid obstacles and interferences encountered. Before installing, verify exact location and elevations at work site. DO NOT SCALE plans. If field conditions, details, changes in equipment or shop drawing information require an important rearrangement, report same to Owner's Representative for review. Obtain written approval for all major changes before installing.

C. Install work so that items both existing and new are operable and serviceable. Eliminate interference with removal of coils, motors, filters, belt guards and/or operation of doors. Provide easy, safe, and code mandated clearances at controllers, motor starters, valve access, and other equipment requiring maintenance and operation. Provide new materials, including new piping and insulation for relocated work.

D. Coordinate work with other trades and determine exact route or location of each duct, pipe, conduit, etc., before fabrication and installation. Coordinate with Architectural Drawings. Obtain from Owner's Representative exact location of all equipment in finished areas, such as thermostat, fixture, and switch mounting heights, and equipment mounting heights. Coordinate all work with the architectural reflected ceiling plans and/or existing Architecture. Mechanical and electrical drawings show design arrangement only for diffusers, grilles, registers, air terminals, lighting fixtures, sprinklers, speakers, and other items. Do not rough-in contract work without reflected ceiling location plans.

E. Before roughing for equipment furnished by Owner or in other Divisions, obtain from Owner and other Divisions, approved roughing drawings giving exact location for each piece of equipment. Do not "rough in" services without final layout drawings approved for construction. Cooperate with other trades to insure proper location and size of connections to insure proper functioning of all systems and equipment. For equipment and connections provided in this contract, prepare roughing drawing as follows:
   1. Existing Equipment: Measure the existing equipment and prepare for installation in new location.
   2. New Equipment: Obtain equipment roughing drawings and dimensions, then prepare roughing-in-drawings. If such information is not available in time, obtain an acknowledgement in writing, then make space arrangements as required with Owner's Representative.

## 1.15 COORDINATION DRAWINGS

A. Before construction work commences, Divisions for all trades shall submit coordination drawings in the form of CAD drawing files, drawn at not less than 1/4 in. scale. Such drawings will be required throughout all areas, for all Contracts. These drawings shall show resolutions of trade conflicts in congested areas. Mechanical Equipment Rooms shall be drawn early in coordination drawing process simultaneous with all other congested areas. Prepare Coordination Drawings as follows:
   1. Division 23 shall prepare the base plan CAD coordination drawings showing all ductwork, all pertinent heating piping, and equipment. These drawings may be CAD files of the required Ductwork Shop Drawings. The drawings shall be coordinated with lighting fixtures, sprinklers, air diffusers, other ceiling mounted items, ceiling heights, structural work, maintenance clearances, electric code clearance, reflected ceiling plans, and other contract requirements. Reposition proposed locations of work after coordination drawing review by the Owner's Representative. Provide adjustments to exact size, location, and offsets of ducts, pipes, conduit, etc., to achieve reasonable appearance objectives. Provide these adjustments as part of contract. Minor revisions need not be redrawn.

2. Division 23 shall provide CAD files and submit the base plan CAD Coordination Drawings to all Divisions.
3. Divisions 21 and 22 shall draw the location of piping and equipment on the base plan CAD Coordination Drawings, indicating areas of conflict and suggested resolutions.
4. Divisions 26, 27 and 28 shall draw the location of lighting fixtures, cable trays, and feeders over 1-1/2 in. on the base plan CAD Coordination Drawings, indicating areas of conflict and suggested resolution.
5. The General Construction Trade shall indicate areas of architectural/structural conflicts or obstacles on the CAD Coordination Drawings, and coordinate to suit the overall construction schedule.
6. The General Construction Trade shall expedite all Coordination Drawing work and coordinate to suit the overall construction schedule. In the case of unresolved interferences, he shall notify the Owner's Representative. The Owner's Representative will then direct the various trades as to how to revise their drawings as required to eliminate installation interferences.
7. If a given trade proceeds prior to resolving conflicts, then if necessary, that trade shall change its work at no extra cost in order to permit others to proceed with a coordinated installation. Coordination approval will be given by areas after special site meetings involving all Divisions.

B. The purpose of the coordination drawing process is to identify and resolve potential conflicts between trades, and between trades and existing or new building construction, before they occur in construction. Coordination drawings are intended for the respective trade's use during construction and shall not replace any Shop Drawings, or record drawings required elsewhere in these contract documents.

**1.16 REMOVAL WORK**

A. Where existing equipment removals are called for, submit complete list to Owner's Representative. All items that Owner wishes to retain that do not contain asbestos or PCB material shall be delivered to location directed by Owner. Items that Owner does not wish to retain shall be removed from site and legally disposed of. Removal and disposal of material containing asbestos, lead paint, mercury and PCB's shall be in accordance with Federal, State and Local law requirements. Where equipment is called for to be relocated, contractor shall carefully remove, clean and recondition, then reinstall. Remove all abandoned piping, wiring, equipment, lighting, ductwork, tubing, supports, fixtures, etc. Visit each room, crawl spaces, and roofs to determine total Scope of Work. The disturbance or dislocation of asbestos-containing materials causes asbestos fibers to be released into the building's atmosphere, thereby creating a health hazard to workmen and building occupants. Consistent with Industrial Code Rule 56 and the content of recognized asbestos-control work, the Contractor shall apprise all of his workers, supervisory personnel, subcontractors, Owner and Consultants who will be at the job site of the seriousness of the hazard and of proper safeguards and work procedures which must be followed, as described in New York State Department of Labor Industrial Code Rule 56.

B. For materials indicated to contain lead, that are being affected by demolition or construction, the contractor shall comply with all Federal, State and Local law requirements regarding worker exposure to lead disturbance and abatement procedures.

C. Refer to the Owner's Lead Paint Survey. The Survey identifies the surfaces within the buildings that were tested for lead by collecting paint samples and performing laboratory analysis. If any unidentified surfaces are to be impacted the lead content shall be tested by analytical determinations conducted by a qualified laboratory approved by the Owner. The contractor shall review the current owner’s lead paint reports on file before starting any work which may disturb existing surfaces.

D. [Refer to Division 02 for additional information regarding hazardous materials.]

## 1.17 REFRIGERANT RECOVERY

A. Existing equipment to be removed, as shown on the plans may contain refrigerant and refrigerant oils. This refrigerant and refrigerant oil must be handled in accordance with Federal, State and Local law requirements.

B. Removal and recovery of refrigerant shall be in accordance with the current edition of Section 608 of the Clean Air Act of 1990, including all final regulations.

C. Refrigerant recovery must be performed by a technician, certified by an EPA-approved certification program, using refrigerant recovery and recycling equipment certified by an EPA-approved testing organization.

D. Owner "reserves the right of first refusal" on ownership of recovered refrigerant. Should Owner choose to maintain ownership of refrigerant, refrigerant shall be reclaimed, cleaned by this Contractor to ARI 700-1993 Standard of Purity, by an EPA certified refrigerant reclaimer. Refrigerant shall be turned over to the Owner in suitable marked containers to be stored on site, at a place of the Owner's choosing.

## 1.18 EQUIPMENT AND MATERIAL REQUIREMENTS

A. Provide materials that meet the following minimum requirements:
   1. Materials shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, in accordance with NFPA 255.
   2. All equipment and material for which there is a listing service shall bear a UL label.
   3. Potable water systems and equipment shall be built according to AWWA Standards.
   4. Gas-fired equipment and system shall meet AGA Regulations and shall have AGA label.
   5. All electrical equipment and systems, as a whole, shall be tested and listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL) for the intended use in accordance with the applicable standards and have a physical label indicating such.
   6. Fire protection equipment shall be UL listed and FM approved.

B. Exterior and wet locations shall utilize materials, equipment supports, mounting, etc. suitable for the intended locations. Metals shall be stainless steel, galvanized or with baked enamel finish as a minimum. Finishes and coatings shall be continuous and any surface damaged or cut ends shall be field corrected in accordance with the manufacturer's recommendations. Hardware (screws, bolts, nuts, washers, supports, fasteners, etc.) shall be:
   1. Stainless steel where the associated system or equipment material is stainless steel or aluminum.
   2. Hot dipped galvanized or stainless steel where the associated system or equipment is steel, galvanized steel or other.

## 1.19 CUTTING AND PATCHING

A. Each trade shall include their required cutting and patching work unless shown as part of the General Construction Contract. Refer to General Conditions of the Contract for Construction, for additional requirements. Cut and drill from both sides of walls and/or floors to eliminate splaying. Patch cut or abandoned holes left by removals of equipment or fixtures. Patch adjacent existing work disturbed by installation of new work including insulation, walls and wall covering, ceiling and floor covering, other finished surfaces. Patch openings and damaged areas equal to existing surface finish. Cut openings in prefabricated construction units in accordance with manufacturer's instructions.

## 1.20 PAINTING

A. Paint all insulated and bare piping, pipe hangers and supports exposed to view in mechanical equipment rooms, penthouse, boiler rooms and similar spaces. Paint all bare piping, ductwork and supports exposed to the out-of-doors with rust inhibiting coatings. Paint all equipment that is not factory finish painted (i.e. expansion tanks, etc.).

B. All painting shall consist of one (1) prime coat and two (2) finish coats of non-lead oil base paint, unless otherwise indicated herein. Provide galvanized iron primer for all galvanized

surfaces. All surfaces must be thoroughly cleaned before painting. Review system color coding prior to painting with the Owner's Representative or Architect.

C. All items installed after finished painting is completed and any damaged factory finish paint on equipment furnished under this contract must be touched up by the Contractor responsible for same.

D. Include painting for patchwork with color to match adjacent surfaces. Where color cannot be adequately matched, paint entire surface. Provide one (1) coat of primer and two (2) finish coats or as called for in the Specifications.

E. All primers and paint used in the interior of the building shall comply with the maximum Volatile Organic Compound (VOC) limits called for in the current version of U.S. Green Building Council LEED Credits EQ 4.1 and EQ 4.2.

F. Refer to Division 9 - Finishes, for additional information.

**1.21 CONCEALMENT**

A. Conceal all contract work above ceilings and in walls, below slabs, and elsewhere throughout building. If concealment is impossible or impractical, notify Owner's Representative before starting that part of the work and install only after their review. In areas with no ceilings, install only after Owner's Representative reviews and comments on arrangement and appearance.

**1.22 CHASES**

A. New Construction:
   1. Certain chases, recesses, openings, shafts, and wall pockets will be provided as part of General Construction Trade. Mechanical and Electrical trades shall provide all other openings required for their contract work.
   2. Check Architectural and Structural Design and Shop Drawings to verify correct size and location for all openings, recesses and chases in general building construction work.
   3. Assume responsibility for correct and final location and size of such openings.
   4. Rectify improperly sized, improperly located or omitted chases or openings due to faulty or late information or failure to check final location.
   5. Provide 18 gauge galvanized sleeves and inserts. Extend all sleeves 2 in. above finished floor. Set sleeves and inserts in place ahead of new construction, securely fastened during concrete pouring. Correct, by drilling, omitted or improperly located sleeves. Assume responsibility for all work and equipment damaged during course of drilling. Firestop all unused sleeves.
   6. Provide angle iron frame where openings are required for contract work, unless provided by General Construction trade.

**1.23 PENETRATION FIRESTOPPING**

A. Refer to Division 07 for project-wide fire stopping information.

**1.24 NON-RATED WALL PENETRATIONS**

A. Each trade shall be responsible for sealing wall penetrations related to their installed work, including but not limited to ductwork, piping, conduits, etc. See individual specification sections for requirements.

**1.25 SUPPORTS**

A. Provide required supports, beams, angles, hangers, rods, bases, braces, and other items to properly support contract work. Modify studs, add studs, add framing, or otherwise reinforce studs in metal stud walls and partitions as required to suit contract work. If necessary, in stud walls, provide special supports from floor to structure above.

B. For precast panels/planks and metal decks, support mechanical/electrical work as determined by manufacturer and the Engineer. Provide heavy gauge steel mounting plates for mounting contract work. Mounting plates shall span two or more studs. Size, gauge, and strength of mounting plates shall be sufficient for equipment size, weight, and desired rigidity.

C. For finished areas without a finished ceiling system such as classrooms, offices, conference rooms, etc., where decking and structure is exposed, and ductwork/piping/conduit is exposed: All mounting brackets, channel support systems and mounting hardware for ductwork, piping, lighting, etc. shall be concealed and approved by the Architect/Engineer prior to the installation. AirCraft cable style hanging for ductwork is required. It is recommended that room mockups be done and receive Architect/Engineer approval prior to proceeding with installation.

D. Equipment, piping, conduit, raceway, etc. supports shall be installed to minimize the generation and transmission of vibration.

E. Materials and equipment shall be solely supported by the building structure and connected framing. Gypboard, ceilings, other finishes, etc. shall not be used for support of materials and equipment.

**1.26 APPLIED FIREPROOFING**

A. Scope: Provide encapsulation of surfaces where applied fireproofing materials have been disturbed, removed, or left missing by the removal of hangers or upper attachments, or when new hangers or upper attachment are installed.

B. Fire Resistance Rating: Fireproofing shall meet the original hourly rating when applied to the construction assembly where materials have been removed or disturbed, or is missing.

C. Fire Hazard Classification: Fireproofing shall be listed in the Underwriters Laboratories Building Materials Directory with the following performance properties:
   1. Flame Spread: 10 or less.
   2. Smoke Developed: 5 or less.

D. Product Data: Provide manufacturer's product descriptions for each required fireproofing material. Include application instructions, including primer/adhesive requirements and recommended minimum thickness and density for each required hourly rating.

E. Fire Proofing Manufacturer:
   1. Retro-Guard cementitious replacement fireproofing by Grace Construction Products, or equivalent Cafco Blaze Shield, and Cafco 300 by Isolatek.
   2. Physical Properties:
      a. Dry Field Density (ASTM E 605): 15 lb/cu ft minimum average.
      b. Cohesion/Adhesion (Bond Strength) (ASTM E 736): 200 lb/sq ft minimum average.
      c. Compressive Strength (ASTM E 761): 500 lb/sq ft minimum.
      d. Impact (Bond Impact) Resistance (ASTM E 760): Shall not crack or delaminate.
      e. Effect of Deflection (ASTM E 759): Shall not crack or delaminate.
      f. Corrosion Resistance (ASTM E 937): No evidence of corrosion.
      g. Air Erosion (ASTM E 859): Maximum 0.025 g/sq ft weight loss.
      h. Provide primer or adhesive recommended by the fireproofing manufacturer to obtain required bond strength for the specific fireproofing and substrate.

F. Apply fireproofing prior to installation of ductwork, piping, conduits, and other suspended items. Hangers, clips and other supports for these items shall be installed before application of fireproofing.

G. Examine the substrate and conditions under which fireproofing is to be applied. Do not proceed with the fireproofing work until unsatisfactory conditions have been corrected. Verify that hangers, clips, sleeves, and other items that will penetrate the fireproofing are in place. Check paint on substrate for compatibility with primer/fireproofing and adequacy of bond strength in accordance with fireproofing manufacturer's instructions.

H. Surface Preparation: Remove dirt, dust, oil, grease, loose paint and rust, mill scale, and other foreign matter that may impair the bonding of the fireproofing to the substrate. Clean substrate free of contamination from chemicals and solvents. Apply primer/adhesive where necessary to obtain bond strength of fireproofing to steel shop paint and where recommended by the fireproofing manufacturer.

I. Apply the fireproofing in accordance with UL fire test report and the manufacturer's application instructions. Thickness and density of fireproofing shall be in accordance with the approved product data and as required to produce the hourly fire resistance rating required.

**1.27 ACCESS PANELS**

A. Provide access panels for required access to respective trade's work. Location and size shall be the responsibility of each trade. Access panels provided for equipment shall provide an opening not smaller than 22 in. by 22 in. Panels shall be capable of opening a minimum of 90 degrees. Bear cost of construction changes necessary due to improper information or failure to provide proper information in ample time. Access panels over 324 square inches shall have two cam locks. Provide proper frame and door type for various wall or ceiling finishes. Access panels shall be equal to "Milcor" as manufactured by Inland Steel Products Co., Milwaukee, Wisconsin. Provide General Construction trade with a set of architectural plans with size and locations of access panels.

**1.28 CONCRETE BASES**

A. Provide concrete bases for all floor mounted equipment. Provide 3,000 lb. concrete, chamfer edges, trowel finish, and securely bond to floor by roughening slab and coating with cement grout. Bases 4 in. high (unless otherwise indicated); shape and size to accommodate equipment. Provide anchor bolts in equipment bases for all equipment provided for the project, whether mounted on new concrete bases or existing concrete bases.

**1.29 HVAC EQUIPMENT CONNECTIONS**

A. Contractor is responsible for draining, filling, venting, chemically treating and restarting any systems which are affected by work shown on the Contract Documents unless specifically noted otherwise.

B. Provide final condensate, hot water, glycol, chilled and condenser water, drain connections to all equipment as required by the equipment. Provide final connections, including domestic water piping, wiring, controls, and devices from equipment to outlets left by other trades. Provide equipment waste, drip, overflow and drain connections extended to floor drains.

C. Provide for Owner furnished and Contractor furnished equipment all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, insulation, sheet metal work, controls, dampers, as required.

**1.30 PLUMBING EQUIPMENT CONNECTIONS**

A. Contractor is responsible for draining, filling, venting, chemically treating and restarting any systems which are affected by work shown on the Contract Documents unless specifically noted otherwise.

B. Provide roughing and final water, waste, vent, gas, air connections to all equipment. Provide loose key stops, sanitary "P" traps, tailpiece, adapters, gas or air cocks, and all necessary piping and fittings from roughing point to equipment. Provide installation of sinks, faucets, traps, tailpiece furnished by others. Provide cold water line with gate valve and backflow prevention device at locations called for. Provide continuation of piping and connection to equipment that is furnished by others. Provide relief valve discharge piping from equipment relief valves.

C. Provide valved water outlet adjacent to equipment requiring same. Provide equipment type floor drains, or drain hubs, adjacent to equipment.

D. Install controls and devices furnished by others.

E. Refer to Contract Documents for roughing schedules, and equipment and lists indicating scope of connections required.

F. Provide for Owner furnished and Contractor furnished equipment all valves, piping, piping accessories, traps, pressure reducing valves, gauges, relief valves, vents, drains, as required.

### 1.31 ELECTRICAL EQUIPMENT CONNECTIONS

A. Provide complete power connections to all electrical equipment. Provide control connections to equipment. Heavy duty NEC rated disconnect ahead of each piece of equipment. Ground all equipment in accordance with NEC.

B. Provide for Owner furnished and Contractor furnished equipment all power wiring, electric equipment, control wiring, switches, lights, receptacles, and connections as required.

### 1.32 STORAGE AND PROTECTION OF MATERIALS AND EQUIPMENT

A. Store Materials on dry base, at least 6 in. aboveground or floor. Store so as not to interfere with other work or obstruct access to buildings or facilities. Provide waterproof/windproof covering. Remove and provide special storage for items subject to moisture damage. Protect against theft or damage from any cause. Replace items stolen or damaged, at no cost to Owner.

B. [Refer to Division 01 for additional information.]

### 1.33 FREEZING AND WATER DAMAGE

A. Take all necessary precautions with equipment, systems and building to prevent damage due to freezing and/or water damage. Repair or replace, at no change in contract, any such damage to equipment, systems, and building. Perform first seasons winterizing in presence of Owner's operating staff.

### 1.34 OWNER INSTRUCTIONS

A. Before final acceptance of the work, furnish necessary skilled labor to operate all systems by seasons. Instruct designated person on proper operation, and care of systems/equipment. Repeat instructions, if necessary. Obtain written acknowledgement from person instructed prior to final payment. Contractor is fully responsible for system until final acceptance, even though operated by Owner's personnel, unless otherwise agreed in writing. List under clear plastic, operating, maintenance, and starting precautions procedures to be followed by Owner for operating systems and equipment.

### 1.35 OPERATION AND MAINTENANCE MANUALS

A. Submit by email (preferred) or digital media, thru the normal project submittal process. Include a copy of each final approved Shop Drawing, wiring diagrams, piping diagrams, spare parts lists, final testing and balancing report, as-built drawings and manufacturer's instructions. Include typewritten instructions, describing equipment, starting/operating procedures, emergency operating instructions, summer-winter changeover, freeze protection, precautions and recommended maintenance procedures. Include name, address, and telephone number of installing contractor and of supplier manufacturer Representative and service agency for all major equipment items. Provide a table of contents page and dividers based upon specification section numbers. Submit in a compiled and bookmarked PDF format as outlined below. Each item listed in the table of contents shall include a hyperlink to the associated section of the O&M Manual, in addition to the bookmarking.

B. Provide content for Operation and Maintenance Manuals as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Engineer will comment on whether content of operation and maintenance submittals is acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

C. Submit Operation and Maintenance Manuals in the following format:
   1. Submit by uploading to web-based project software site, or by email to Architect, as a formal project submittal in conformance with the project specific submittal procedures. Enable reviewer comments on draft submittals.

2. 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.
3. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in the 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.

D. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing Owner training. Engineer will comment on whether general scope and content of manual are acceptable.

E. Final Manual Submittal: Submit O&M manual in final form prior to requesting inspection for Substantial Completion and at least 2 weeks before commencing Owner training. Engineer will return copy with review comments.
1. Correct or revise O&M manual to comply with Engineer'scomments. Submit copies of each corrected manual within 2 weeks of receipt of Engineer's comments.

F. [Refer to Division 01 for additional requirements.]

**1.36 RECORD DRAWINGS**

A. The Contractor shall obtain at his expense one (1) set of construction Contract Drawings, (including non-reproduction black and white prints or electronic files) for the purpose of recording as-built conditions.

B. The Contractor shall perform all survey work required for the location and construction of the work and to record information necessary for completion of the record drawings. Record drawings shall show the actual location of the constructed facilities in the same manner as was shown on the bid drawings. All elevations and dimensions shown on the drawings shall be verified or corrected so as to provide a complete and accurate record of the facilities as constructed.

C. It shall be the responsibility of the Contractor to mark EACH sheet of the contract documents in red and to record thereon in a legible manner, any and all approved field changes and conditions as they occur. A complete file of approved field sketches, diagrams, and other changes shall also be maintained. At completion of the work, the complete set of red marked contract documents, plus all approved field sketches and diagrams shall be submitted to the engineer and used in preparation of the record drawings.

D. A complete set of red marked contract drawings shall be submitted, at one time, as the "Record" set. If there are no changes to a specific drawing, the contractor shall indicate "NO CHANGES" on that drawing. ALL drawings shall be included in the "Record" set.

E. The complete set of red marked Contract Documents or electronic files shall be certified by the Contractor as reflecting record conditions and submitted to the engineer for review.

F. The Contractor shall have the marked up set scanned, if they are not already electronic files, and then submit them to the Engineer as the "Record Set".

G. [Refer to Division 01 for additional requirements.]

**1.37 FINAL INSPECTION**

A. Upon completion of all Engineering Site Observation list items, the Contractor shall provide a copy of the Engineering Site Observation Report back to the Engineer with each items noted as completed or the current status of the item.

**1.38 COMMISSIONING**

A. Refer to General Commissioning Requirements in Division 01 for additional requirements.

## 1.39 TEMPORARY HEATING AND COOLING

A. Refer to the General Conditions of the Contract for Construction and Supplemental General Conditions.

## 1.40 TEMPORARY FACILITIES

A. Refer to the Division 01 Sections, General Conditions and Supplemental General Conditions.

## 1.41 TEMPORARY LIGHT AND POWER

A. Refer to the Division 01 Sections, General Conditions and Supplemental General Conditions.

## 1.42 CLEANING

A. It is the Contractor's responsibility to keep clean all equipment and fixtures provided under this contract for the duration of the project. Each trade shall keep the premises free from an accumulation of waste material or rubbish caused by his operations. The facilities require an environment of extreme cleanliness, and it is the Contractor's responsibility to adhere to the strict regulations regarding procedures on the existing premises. After all tests are made and installations completed satisfactorily:
   1. Thoroughly clean entire installation, both exposed surfaces and interiors.
   2. Remove all debris caused by work.
   3. Remove tools, surplus, materials, when work is finally accepted.

## 1.43 TRANSFER OF ELECTRONIC FILES

A. M/E Engineering, P.C. will provide electronic files for the Contractor's use in the preparation of sheet metal shop drawings, coordination drawings, or record drawings related to the project, subject to the following terms and conditions:
   1. The Contractor shall submit a formal request for electronic drawing files on the M/E Engineering, P.C. website, by utilizing the following website link: http://www.meengineering.com/contact-pages/contractor-request
   2. M/E Engineering, P.C. makes no representation as to the compatibility of these files with the Contractor's hardware or the Contractor's software beyond the specific release of the referenced specifications.
   3. M/E Engineering can only provide CAD files of M/E/P/FP drawing levels for which we are the Engineer of Record. CAD files of Architectural backgrounds, reflected ceiling plans, structural plans, etc. must be obtained separately from the Architect of Record.
   4. Data contained on these electronic files is part of M/E Engineering, P.C.'s instruments of service shall not be used by the Contractor or anyone else receiving data through or from the Contractor for any purpose other than as convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by the Contractor or by others will be at the Contractor's sole risk and without liability or legal exposure to M/E Engineering, P.C. The Contractor agrees to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against M/E Engineering, P.C., its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with the Contractor's use of the electronic files.
   5. Furthermore, the Contractor shall, to the fullest extent permitted by law, indemnify and hold harmless, M/E Engineering, P.C. from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from the Contractor's use of these electronic files.

6. These electronic files are not contract documents. Significant difference may arise between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. M/E Engineering, P.C. makes no representation regarding the accuracy or completeness of the electronic files the Contractor receives. In the event that a conflict arises between the signed contract documents prepared by M/E Engineering, P.C. and electronic files, the signed contract documents shall govern. The Contractor is responsible for determining if any conflicts exist. By the Contractor's use of these electronic files the Contractor is not relieved of the Contractor's duty to comply with the contract documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, field verify conditions and coordinate the Contractor's work with that of other contractors for the project.

**END OF SECTION 26 05 00**

**SECTION 26 05 01**
**BASIC MATERIALS AND METHODS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

B. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.

C. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.

D. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).

E. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

H. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

I. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

### 1.02 DESCRIPTION

A. The drawings are diagrammatic, unless detailed dimensioned drawings are included, and show only approximate locations of equipment, fixtures, panelboards, conduits, and wiring devices. Exact locations are subject to the approval of the Owner's Representative. The general run of electrical feeders, branch circuits, and conduits, indicated on the drawings, is not intended to be the exact routing. Exact routings of conduit shall suit the job conditions.

B. Circuit designations, in the form of "Home Runs" on branches, indicate the designation of the branch circuit, the size and the quantity of branch circuit conductors, and the panel board or interconnection box from which the branch circuit is served.

C. Make measurements at the site and in the building during construction for all systems installed as the work progresses in such a manner that the equipment, piping, vents, ducts, conduit, and boxes will fit in the space available. Maintain headroom and if in unfinished areas, be as neatly installed, as obscure and "out-of-the-way" as physically possible. Where more than one trade is involved in an area, space or chase, all shall cooperate and install their own work to utilize the space equally between them in proportion to their individual requirements. In general, ductwork shall be given preference except where grading of piping becomes a problem, followed by piping then electrical wiring. If, after installation of any equipment, piping, ducts, conduit, and boxes, it is determined that ample maintenance and passage space has not been provided, rearrange work and /or furnish other equipment as required for ample maintenance space.

D. Any changes in the size or location of the material or equipment supplied, which may be necessary in order to meet field conditions or in order to avoid conflicts between trades, shall be brought to the immediate attention of the Owner's Representative and approval received before such alterations are made.

### 1.03 QUALITY ASSURANCE

A. Electric equipment shall be installed in a neat and workmanlike manner. All methods of construction, details of workmanship, that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative.

B. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc., correspond to the nomenclature dictated by those manufacturers. Where "or equal" is stated, equipment shall be

equal in every way to that of the equipment specified and subject to approval. All equipment shall be tested at the factory. Unless specified elsewhere, standard factory inspection and operational tests will be acceptable.

**1.04 SUBMITTALS**

A. Submit product data for the following equipment, materials and products, including all fittings and accessories:
   1. Conduit
   2. Expansion Fittings
   3. Wireway and Wire Trough
   4. Channel Support Systems
   5. Conductors
   6. Poke-Through Service Fittings
   7. Terminal and Equipment Cabinets
   8. Floor Boxes
   9. Wiring Devices Including Dimmers
   10. Telephone/Data Communication Outlets
   11. Television Outlets
   12. Underground Pullboxes (Handholes) and Covers
   13. Water Proofing Seals
   14. Flashing, Sealing, Firestopping Materials
   15. Salvageable Materials
   16. Testing reports prior to energizing equipment and materials.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

A. Conduit, Raceway and Tubing:
   1. Rigid Metal Conduit (RMC) shall be hot-dipped galvanized or electro-galvanized steel, UL listed "rigid metal conduit."
      a. Acceptable Manufacturers:
         1) Nucor Tubular Products
         2) Allied Tube and Conduit
         3) Wheatland Tube
         4) Approved equal
   2. Electrical Metallic Tubing (EMT) shall be electro-galvanized steel with corrosion resistant zinc coating; UL listed.
      a. Acceptable Manufacturers:
         1) Nucor Tubular Products
         2) Allied Tube and Conduit
         3) Wheatland Tube
         4) Approved equal
   3. Flexible Metal Conduit (FMC) shall be constructed of one continuous length of electro-galvanized, spirally wound steel strip with interlocking convolutions and interior surfaces free from burrs and sharp edges; UL listed.
      a. Acceptable Manufacturers:
         1) AFC (American Flexible Conduit) Cable Systems
         2) Anaconda Sealtite by ANAMET Electrical, Inc.
         3) Southwire
   4. Liquidtight Flexible Metal Conduit (LFMC) shall be constructed of one continuous length of electro-galvanized, spirally wound steel strip with interlocking convolutions, interior surfaces free from burrs and sharp edges, and an outer liquidtight, nonmetallic, sunlight-resistant jacket; UL listed.
      a. Acceptable Manufacturers:
         1) AFC (American Flexible Conduit) Cable Systems

2) Anaconda Sealtite by ANAMET Electrical, Inc.
3) Southwire

5. Rigid Polyvinyl Chloride Conduit (PVC) shall be made from polyvinyl chloride compound and be homogenous plastic material free from visible cracks, holes, or foreign inclusions. Conduit bore shall be smooth and free of blisters, nicks, or other imperfections. Conduit shall be rated for use with 90ºC conductors and UL listed. Conduit and fittings shall be tested in accordance with the testing requirements defined in NEMA TC 2, NEMA TC 3, UL 651 and UL-514. Schedule 40 shall be white in color; Schedule 80 shall be gray in color.
   a. Acceptable Manufacturers:
      1) Carlon
      2) Heritage Plastics
      3) JM Eagle
      4) Cantex

B. Conduit Fittings:
1. Fittings for rigid metal conduit shall be fully threaded and shall be of the same material as the respective raceway system. Fittings for electrical metallic tubing shall be interlocking compression type of cadmium or zinc coated steel or stainless steel. Connectors shall also have insulated throat or plastic insulating bushing up to and including 1 inch (25.4 mm). size. For sizes 1-1/4 inch (32 mm). and larger, provide plastic insulating bushing. Die-cast, pressure cast fittings shall not be used. Fittings for rigid non-metallic conduit shall be solvent cemented in accordance with the manufacturer's instructions.
   a. Acceptable Manufacturers:
      1) O.Z. Gedney
      2) Steel City
      3) Thomas & Betts
      4) Crouse-Hinds
      5) Carlon
2. Expansion Fittings shall be watertight, combination expansion and deflection type designed to compensate for movement in any direction. Fittings shall have flexible copper braid bonding jumpers, neoprene sleeve and stainless steel bands, use aluminum body fittings for rigid aluminum conduit.
   a. Acceptable Manufacturers:
      1) Crouse-Hinds, Type "XD"
      2) O.Z./Gedney, Type "DX"
      3) Approved equal

C. Wireway, Wire Trough, and Auxiliary Gutters:
1. Wireway and Wire Trough shall be hinged cover type wireway with provisions for full lay-in along the entire length of run. Wireway shall be steel, enclosed with gray enamel finish. Provide NEMA 1 units for interior/dry/clean locations and NEMA 12 for interior dry maintenance/shop/utility locations. Size to meet NEC fill requirements or larger as noted on Contract Documents. Provide knockouts along runs. Recess in wall where required for flush mounted equipment. Hinge shall be on the bottom of front face for horizontal mounting. Provide all covers, couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, tees, pullboxes, hangers, reducers, supports, and other fittings to match and mate with wireways as required for complete system.
   a. Acceptable Manufacturers:
      1) Square D "Square Duct"
      2) General Electric
      3) Hoffman
      4) Meco

D. Strut-Type Channel Raceways and Fittings:

1. Strut-Type Channel Raceways and Fittings shall be provided for racking of conduit, trapeze suspensions, equipment support, cable racks and panel racks. Channel shall be steel with electroplated zinc finish for interior dry locations. Provide necessary accessories such as bolts, screws, anchors, connection plates, and straps as required to perform the necessary functions. Wet location and exterior channel support systems shall be steel with hot dipped galvanized finish and stainless steel hardware as a minimum. Cut ends shall be touched up with suitable matching finish. Provide poured-in-place inserts for supporting channels at poured concrete walls and ceilings.
    a. Acceptable Manufacturers:
        1) Unistrut
        2) Globe
        3) Kindorf
        4) B-Line

E. Low Voltage (600V or less) Conductors and Cables:
1. Conductors shall be insulated for 600 volts, unless otherwise noted, and shall be standard AWG and kcmil sizes. Conductors shall be 98% copper, thermal plastic or cross-linked polymer insulated, heat and moisture resistant. Conductor sizes No. 18 AWG and smaller shall be a solid single strand; No. 16 AWG and larger shall be multiple stranded. Minimum conductor size shall be #12 AWG except smaller sizes may be used for communications and special systems. Conductor sizes shall be as called for. Conductors shall be labeled with UL seal and be marked with the manufacturer's name, wire size and insulation type. Insulation for all 600 volt conductors shall be Type THHN/THWN-2 or Type XHHW-2, unless otherwise noted. All exterior and underground conductors shall be XHHW-2. Luminaire fixture wire shall conform to the latest Underwriters Laboratories requirements. Flexible cords and cables for general portable use shall be Type SO or SOOW or as noted. Cables for special use shall be of the type specified for the application.
    a. Color Coding:
        1) All circuits shall be color coded according to the following schedule.

| | Three Phase 120/208V | Three Phase 277/480V |
|---|---|---|
| Ground | Green | Green |
| Neutral | White | Gray |
| A or L1 | Black | Brown |
| B or L2 | Red | Orange |
| C or L3 | Blue | Yellow |

    b. Acceptable Manufacturers:
        1) General Cable (Brand of Prysmian Group)
        2) Southwire
        3) The Okonite Company
        4) Service Wire Co.
        5) Encore Wire
2. Terminal Lugs and Connectors:
    a. The lug shall be capable of continuous operation at the current rating of the cable it is used on. The lug shall be UL listed per UL 486A, using industry standard crimping tools and dies. Terminal lugs shall be solderless, pressure type with UL label for "CU/AL" conductor terminations. The lug shall be a closed-end compression (crimp) type, constructed of seamless, alloy suitable for copper and/or aluminum conductors to match the conductor.
        1) The lug shall be made with a chamfered inside end, for ease of conductor insertion. Both one and two hole lugs shall be NEMA sized for standard stud sizes and spacing. The lug shall be designed for use at the system voltage.
        2) Acceptable Manufacturers:
            (a) 3M Scotchlok 30,000 and 31,000 Series

(b) Burndy
(c) O.Z./Gedney
(d) Thomas and Betts

b. The conductor connection shall be capable of continuous operation at the current rating of the cables it is used on. The connection shall be UL listed per UL 486A, using industry standard crimping tools and ides. The connector shall be an inline compression (crimp) type, constructed of seamless, tin-plated copper. The connector shall be constructed with chamfered inside-ends and with center cable stops. The connector shall be designed for use at the system voltage.
   1) Acceptable Manufacturers:
      (a) 3M Scotchlok 10,000 and 11,000 Series
      (b) Burndy
      (c) O.Z./Gedney
      (d) Thomas and Betts

c. "Split-bolt" Connectors shall be solderless type.
   1) Acceptable Manufacturers:
      (a) Burndy
      (b) Kearney
      (c) O.Z./Gedney
      (d) Thomas and Betts
      (e) Anderson

d. "TWIST ON" Connectors shall be spiral steel spring type and insulated with vinyl cap and skirt.
   1) Acceptable Manufacturers:
      (a) 3-M Company "Scotch-Lok"
      (b) Ideal "Wing-Nuts"
      (c) Approved equal

F. Outlet Boxes, Device Boxes, Rings, and Covers:
   1. Outlet Boxes having pryout openings, knockouts, threaded entries, or hubs in either the sides of the back, or both, for entrance of conduit or cable fittings, or cables, with provisions for mounting outlet box cover.
      a. Outlet boxes shall be galvanized steel, not less than 2-1/2 inch (64 mm). deep, unless restricted by the surroundings, 4 inch (101.6 mm). square or octagonal. Boxes and associated fittings, plates and devices shall be mechanically fastened (screwed), friction fitting is not acceptable. Outlet boxes exposed to moisture, surface mounted, exterior, wet or damp locations shall be cadmium cast alloy complete with external threaded hubs and gasketed screw fastened covers. Minimum box size shall be as indicated in the NEC for the conductors and devices installed. Boxes shall be approved for the environmental condition where they will be installed.
   2. Conduit bodies providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point and listed in accordance with outlet box requirements.
   3. Extension ring intended to extend sides of outlet box or device box to increase box, volume, or both
      a. Acceptable Manufacturers:
         1) Steel City
         2) Raco
         3) Appleton
         4) Crouse Hinds
   4. Telephone/Data Communications Outlet Boxes:
      a. 4 inch (101.6 mm). x 4 in. outlet box with single gang plaster ring with blank cover plate and conduit routed to accessible ceiling space. Cover plate shall match the

receptacle cover type.

5. Pull and junction boxes shall be constructed of not less than 14 gauge galvanized steel with trim for flush or surface mounting in accordance with the location to be installed. Provide screw-on type covers. Boxes installed in damp or wet locations shall be of raintight construction with gasketed cover and threaded conduit hubs. In no case shall boxes be sized smaller than as indicated NEC for conduit and conductor sizes installed. Boxes shall be approved for the environmental condition of the location where they will be installed.
    a. Acceptable Manufacturers:
        1) Hoffman
        2) Keystone
        3) Approved equal

G. Terminal and Equipment Cabinets:
1. Terminal and equipment cabinets shall be code gauge galvanized steel with removable endwalls. Fronts shall be of code gauge steel, flush or surface type (as indicated) with concealed trim clamps, concealed hinges, flush lock, and grey baked enamel finish.
    a. Boxes and front shall be UL listed and shall be minimum 35 inch (889 mm). H x 24 inch (609.6 mm). W x 6 inch (152.4 mm). D. Provide removable insulated plywood terminal board mounted on inside back wall of cabinet.
    b. Acceptable Manufacturer:
        1) Square D "Mono-Flat"
        2) Approved equal

H. Wiring Devices:
1. Wiring Devices (toggle switches, key switches, receptacles, dimmers, occupancy sensors, etc.) shall be specification grade as a minimum. Switch handle and receptacle face shall be as directed by the Architect. Provide device cover plates of rounded nylon colored to match the device in finished areas and rounded raised (Steel City 450/460 series) only for surface mounted locations in unfinished areas. Provide neoprene gasketed cast aluminum/zinc box with hinged (for receptacle) rain tight cast aluminum/zinc lockable while in use cover with stainless steel hardware for devices designated "WP".
    a. Acceptable Manufacturers:
        1) Leviton Decora (Design Make)
        2) Hubbell
        3) Pass and Seymour
2. Toggle/Snap Switches:
    a. Units shall be quiet operation, quick make/quick break, rated for 20A/120-277V/1hp at 120/277V, side/back wired, with nylon/polycarbonate toggle, self grounding mounting screw clip plate (not staple), ground terminal and silver alloy contacts. Units shall meet latest Federal Specification WS-896, NEMA WD 1 and UL Test 20. Single pole units shall be Hubbell HBL1221, P&S 20AC1 or Leviton 1221-2. Provide two pole, three way, four way, illuminated handle, keyed, etc. type of the same quality and model.
    b. Momentary Contact: Units shall be as indicated above (20A, 277V, nylon handle, side/back wired), three position, two circuit/three wire with spring return to center position, provide where indicated and as needed for proper system operation. Hubbell HBL 1557, P&S 1250, Leviton 1256 or approved equal. Provide keyed operation or pilot light where indicated. When used for lighting controls for vacancy sensor control, provide jumper across the circuit terminals.
3. Receptacles:
    a. Provide receptacles where indicated on the drawings and where called for. Provide type receptacle as indicated and if not indicated then utilize general receptacle.
    b. General Receptacle: Units shall be NEMA 5-20R, duplex, 20A, 125V, side/back wired, #14 to 10AWG screw terminals with nylon face, indented brass contacts for three point connection, self-grounding stainless steel mounting screw clip plate and

green ground terminal. Shall meet requirements of Federal Specification W-C-596, NEMA WD 6 and UL 498.

1) Units shall have 0.03" thick brass contacts, 0.04 inch (1.02 mm) galvanized steel mounting strap and be: Hubbell BR20, P&S BR20 or Leviton BR20.

c. Ground Fault Interrupting Receptacles: Units shall be as specified above for General Receptacle and have 5mA interrupting ground fault level, test/reset front buttons, full through feed capability, power off on reverse wired sensing, 10kA short circuit current rating, be tamper/weather resistant and in compliance with UL 943. Unit shall self-test function to periodically test the components automatically and indicate a failure condition utilizing an LED. Shall be Hubbell GFR5362, P&S 2096TR or Leviton S7599TR.

d. Tamper Resistant Receptacles: Units shall be as specified above for General Receptacle and have protective shutters to prevent entry into the line or grounded front openings unless all plug prongs are present.

e. Special Receptacles: provide other type receptacles as indicated herein or on the drawings. Such receptacles shall be Hubbell, P&S or Leviton highest grade available.

4. Television Outlets:

a. 4 inch (101.6 mm). x 4 in. outlet box with single gang plaster ring with blank cover plate. Cover plate shall match the receptacle cover type.

I. Underground Pullboxes (Handholes):

1. Sidewalk and Grass Areas: Boxes shall be comprised of composite material with stainless steel hardware and ANSI Tier 8 rating minimum. Provide conduit/duct openings per the plans/schematics with spare capacity for 2 - 2" in each side wall, minimum. Box shall be minimum 2'-0" wide x 2'-0" long x 3'-0" deep inside dimensions, or larger as required to meet NEC requirements. Cover shall be imprinted with either "Electric", "Telephone", etc. to designate type of service. Provide 18 inch (457.2 mm). of #2 crushed stone under pullbox and 18 in. beyond. Refer to drawings per details and locations.

a. Manufacturers:

1) Quazite

2) Old Castle

3) Approved equal

2. All Other Areas: Boxes shall have ANSI Tier 22 rating (22,500lb weight rating) and be comprised of steel reinforced concrete walls and bottom sections using 5,000 psi (34473.80 kPa), minimum concrete. Bottom shall have 12 inch (304.8 mm). diameter sump opening and 3/4 inch (19.05 mm). ground rod opening. Knockouts and openings shall be positioned for conduits/ducts. Provide two (2) rows of anchor bolt inserts for cable rack supports to permit installation of two (2) cable rack supports on each side wall and one (1) cable rack support on each end wall. Provide hot dipped galvanized steel pulling irons at 45° angle between floor and wall opposite each opening. Provide 24 inch (609.6 mm). x 24 in. opening for frame and cover and a suitable masonry "Throat" between top of box and cover frame to allow for variation in final finished grade. Frame and cover shall be cast iron. Box shall be minimum 2'-0" wide x 2'-0" long x 3'-0" deep inside dimensions, or larger as required to meet NEC requirements. Cover shall be imprinted with either "Electric", "Telephone", "Medium Voltage Electric", etc. to designate type of service. Unit shall be rated to AASHTO HS20-44 loading. Provide 18 inch (457.2 mm). drywell of #2 crushed stone under pullbox and 18" beyond. Refer to drawings per details and locations.

a. Manufacturers:

1) Pullbox: Lakelands precast.

2) Cover: Neenah Foundry Company, roadway type.

3) Approved equal.

J. Ductbanks:

1. Ductbanks shall be rigid non-metallic conduit system. Provide all sleeve joints, couplings, bend sections, bends, elbows, offsets, angle couplings, bell ends, caps, base spacers and intermediate spacers as required to meet field conditions. All bends, stub-ups and wall, slab or floor-building penetrations shall be rigid steel conduit without exception.

K. Waterproofing Seals:
   1. Provide expanding link type seal, for installation between duct/conduit, and sleeve or core-drilled hole in concrete.
   2. Make: Link Seal, manufactured by Thunderline Corp., or approved equal.

L. Flashing, Sealing, Fire-stopping:
   1. Fire-Stopping for Openings Through Fire and Smoke Rated Wall and Floor Assemblies:
      a. Provide materials and products listed or classified by an approved independent testing laboratory for "Through-Penetration Fire-Stop Systems". The system shall meet the requirements of "Fire Tests of Through-Penetration Fire-Stops" designated ASTM E814.
      b. Provide fire-stop system seals at all locations where piping, tubing, conduit, electrical busways/cables/wires, ductwork and similar utilities pass through or penetrate fire rated wall or floor assembly. Provide fire-stop seal between sleeve and wall for drywall construction.
      c. The minimum required fire resistance ratings of the wall or floor assembly shall be maintained by the fire-stop system. The installation shall provide an air and watertight seal.
      d. The methods used shall incorporate qualities, which permit the easy removal or addition of electrical conduits or cables without drilling or use of special tools. The product shall adhere to itself to allow repairs to be made with the same material and permit the vibration, expansion and/or contraction of any items passing through the penetration without cracking, crumbling and resulting reduction in fire rating.
   2. Acceptable Manufacturers:
      a. Dow Corning Fire-Stop System Foams and Sealants
      b. Nelson Electric Fire-Stop System Putty, CLK and WRP
      c. S-100 FS500/600, Thomas & Betts
      d. Carborundum Fyre Putty
      e. 3-M Fire Products

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

A. Comply with NECA NEIS (National Electrical Installation Standard) latest edition.

B. Unless otherwise noted, wiring for all systems indicated in the contract documents shall consist of insulated conductors installed in raceways. Raceways shall be continuous from outlet box to outlet box and from outlet box to cabinet, junction or pull box. Secure and bond raceways to all boxes and cabinets so that each system of raceways is electrically continuous throughout. Unless otherwise indicated on the drawings, install all wiring in the following raceway system:
   1. Wiring 600 Volts or Less in Dry Locations: EMT.
   2. Wiring 600 Volts or Less in Dry Locations and Subject to Physical Damage: RMC.
   3. Wiring 600 Volts or Less in Outdoors, Above Grade Locations: RMC.
   4. Wiring 600 Volts or Less Installed Below Grade, in Concrete Floor Slabs or Below Ground Floor Slab: PVC-40 encased in concrete with rigid metal conduit bends and penetrations through building floors and walls.
   5. Flexible metal conduit shall be used for final connection to all motors, final connection to rotating or vibrating equipment, final connections to dry type transformers and final connections to recessed lighting fixtures.
      a. Liquidtight flexible conduit shall be used in all wet or damp locations. Maximum length of flexible conduit shall be 36 inch (914.4 mm)., except that from outlet boxes to lighting fixture maximum length shall be 6 feet (182.88 cm) Provide green

insulated equipment grounding conductor in all flexible metal conduit.

C. Raceways:
   1. Sized as indicated on the drawings. Where sizes are not indicated, raceways shall be sized as required by the National Electrical Code in accordance with the quantity, size, and type of the insulation conductors to be installed. Raceways shall be minimum 3/4 inch (19.05 mm). trade size for branch circuit wiring and minimum 1 inch (25.4 mm). trade size for all telephone, data, intercommunications, instrumentation, fire alarm, television and computer systems and for all branch circuit "Home Runs" to panelboards. Installed to provide adequate grounding between all outlets and the established electrical system ground.
   2. Arranged in a neat manner for access and allow for access to work installed by other trades.
   3. Install raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts handtight, plus one-quarter turn more.
   4. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4 inch (32 mm) trade size and insulated throat metal ground bushings on 1-1/2 inch (38 mm) trade size and larger conduits terminated with locknuts. Install throat metal grounding bushings on service conduit.
   5. Complete raceway installation before starting conductor installation.
   6. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 feet (60.96 cm) above finished floor. Wherever a cluster of four (4) or more raceways rise out of floor exposed, provide neatly formed 6 inch (152.4 mm). high concrete envelop, with chamfered edges, around raceways.
   7. Installed with a minimum of bends and offsets. All bends shall be made without kinking or destroying the cross section contour of the raceway. Factory made bends are acceptable and should be considered for raceways larger than 2 inch (50.8 mm).
   8. Make bends in raceway using large-radius performed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
   9. Conceal conduit within finished walls, ceilings, and floors unless otherwise noted, or where permitted by the Owner's Representative. All exposed raceways shall be painted to match existing adjacent surface as directed by the Architect. Install conduit parallel or perpendicular to building lines.
   10. Support conduit within 12 inches (304.8 mm) of enclosure to which attached.
   11. Seal raceway opening that penetrate rooms or walls with acoustical requirements on both sides of rooms or walls with acoustically rated putty or firestopping.
   12. Differing Temperatures: For raceways routed between areas with differing temperatures (interior to exterior, walk in coolers/freezers, environmental chambers, etc.) install raceway as follows:
      a. Provide a thermal break, 4 inch (101.6 mm). minimum of stainless steel or Schedule 40 PVC conduit within space wall/separation.
      b. Seal raceway penetration through the wall/separation.
      c. Provide a box on each side of the space wall/separation.
      d. Provide raceway interior sealant (duct seal or suitable foam) to provide a complete air barrier after conductors are installed.
      e. Mounting of raceway and boxes on equipment shall be coordinated and approved by the equipment manufacturer.
      f. Installed with exterior surfaces not less than 6 inch (152.4 mm). from any surface with normal operating temperature of 200°F or higher.
   13. Expansion-Joint Fittings:

a. Install in runs of aboveground PVC that are located where environmental temperature change may exceed 30 deg. F and that have straight-run length that exceeds 25 feet (762 cm). Install in runs of aboveground RMC and EMT conduit that are located where environmental temperature change may exceed 100 deg. F and that have straight-run length that exceeds 100 feet (3048 cm).
b. Install expansion fittings at locations where conduits cross building or structure expansion joints.
c. Install with position, mounting, and piston setting selected in accordance with manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
d. Installed such that no undue stress is placed on any electrical raceway due to the proper functioning of expansion joints.

14. Raceway installed in wet/damp locations or on exterior walls shall have a spacer manufactured for this purpose provided to maintain a space/void between the mounting surface and the raceway.
15. Do not install conduits within 2 inches (50.8 mm) of the bottom side of a metal deck roof.
16. Keep raceways at least 6 inches (152.4 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
17. Cut conduit perpendicular to the length. For conduits 2 inch (50.8 mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs. Bush where necessary.
18. Install pull wires in empty raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb tensile strength. Leave at least 12 inch (304.8 mm) of slack at both ends of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
19. Plugged at the ends of each roughed-in raceway with an approved cap or disc to prevent the entrance of foreign materials during construction.
20. Installed with UL approved rain-tight and concrete-tight couplings and connectors.
21. Raceways shall not be attached to or supported by wooden plug anchors or supported from mechanical work such as ductwork, piping, etc.
22. Raceways shall not be installed in concrete slabs.
23. Raceways installed below ground floor slab shall be 6 inch (152.4 mm). minimum below slab with pea stone (NYSDOT 0702-0203) all sides. Where possible, install conduit directly below slab with concrete envelope poured monolithic with slab. Where this is not possible, support raceways and envelop maximum 5 feet (152.4 cm) - 0 inch (0 mm). on centers from underside of structural slab by means of galvanized pipe hangers. Pipe hangers shall be coated with asphalt mastic. Installation shall maintain integrity of waterproofing membrane.
24. If it is necessary to burn holes through webs of beams or girders, call such points to the attention of the Owner's Representative and receive written approval both as to location and size of hole before proceeding with work. All holes shall be burned no larger than absolutely necessary.
25. Become familiar with the general construction of the building and place sleeves, inserts, etc., as required. All penetrations through existing floors shall be core drilled and sleeved.
26. All raceways shall be supported adequately by malleable iron pipe clamps or other approved methods. In exterior or wet locations, supports shall allow not less than 1/4 inch (6.35 mm). air space between raceway and wall. Firmly fasten raceway within 3 feet (91.44 cm) of each outlet box, junction box, cabinet or fitting. The following table lists maximum spacing between conditions, strength of supporting members, etc.
27. Furnish and install such supports at no additional cost to owner.

| Conduit Trade Size | Type of Run | Horizontal Spacing in Feet | Vertical Spacing in Feet |
|---|---|---|---|
| 1/2 inch (12.7 mm)., 3/4 inch (19.05 mm). | Concealed | 7 | 10 |

| | | | |
|---|---|---|---|
| 1 inch (25.4 mm)., 1-1/4 inch (32 mm). | Concealed | 8 | 10 |
| 1-1/2 inch (38 mm). and larger | Concealed | 10 | 10 |
| 1/2 in., 3/4 in. | Exposed | 5 | 7 |
| 1 in., 1-1/4 inch (32 mm). | Exposed | 7 | 8 |
| 1-1/2 inch (38 mm). and larger | Exposed | 10 | 10 |

28. Where raceways puncture roof, install pitch pockets as required in order that the roof warranty is maintained. Coordinate with representative of roofing material manufacturer.
29. At each flush mounted panelboard, terminal cabinet, control cabinet, etc., provide four (4) spare 1 inch (25.4 mm). raceways from panelboard, etc., to an area above the nearest accessible ceiling space. Make 90° turn above the ceiling, arranged for further continuation of raceway, and cap.

D. Underground Raceways and Ductbanks:
1. Encase all underground raceways in concrete, sand (NYSDOT 0733-15), No. 1 crushed stone (NYSDOT 0703-02) or pea stone (NYSDOT 0702-0203). Concrete encasement shall be utilized where indicated and for circuit voltages over 600V. For concrete encasement, form concrete envelope around raceways, 3 inch (76.2 mm). minimum thickness concrete at top, bottom and sides of raceways, conduits on 7-1/2 inch (190 mm). centers both directions with concrete between raceways. Top of concrete envelope shall be finished not less than 24 inch (609.6 mm). below finished grade, except where under building slabs. Open trench for its complete length before concrete is poured; if any obstructions are encountered, make provisions to avoid them. Support raceways minimum 3 in. above bottom of trench before pouring. Furnish and install precast concrete, plastic or fiber spacers. Stagger couplings. When concrete is specified, securely tie raceways in place to prevent floating. Pour concrete as soon as possible after placing and securing of raceways. Pull iron-shod mandrel, not more than 1/4 inch (6.35 mm). smaller than bore of raceway to remove concrete and other obstructions. Clean raceway by drawing through properly sized cylindrical brushes as many times as necessary to remove dirt. Concrete envelopes shall contain reinforcing rods wherever non-metallic raceways are used. Reinforcing shall be continuous runs of No. 4 deformed rods located in all four corners as well as top and bottom of envelope between each raceway. In locations where non-metallic raceways are used, change to heavy wall metallic conduit (RMC) of same internal diameter before rising out of ground and at bends/elbows; provide metallic conduit elbows at conduit rise. Carry concrete envelope to a point 12 inch (304.8 mm). minimum above grade or floor slab at rise point if allowed by site conditions and equipment to be installed. Slope top of concrete away from raceway, chamfer edges. Cap all empty conduits watertight. Place conduit in straight lines. Seal, completely waterproof, all duct joints before encasement. Place direct-bury conduit tier-by-tier method, backfilling each layer to achieve proper spacing utilizing suitable encasement material.
    a. Trench backfill shall be in 6" lifts maximum and compacting between. Backfill to be excavated material with rock and organic material removed. For grass locations provide 8" minimum off site topsoil (NYSDOT 0713.01) and seed to match the existing. Other surfaces shall be returned to the original or better condition to the existing surrounding. Elbows shall have a minimum radius of 42 inch (1066.8 mm). Follow proper low temperature installation procedures as recommended by raceway manufacturer. Provide detectable marking tape in soil above all ductbank sand buried conduit. Repair or replace all existing utilities and facilities damage, due to ductbank installation, as part of contract. Where raceways pass between exterior and interior and terminate in building, switchgear, pullbox, etc. provide conduit sealing bushing (O-Z Gedney CSB or approved equal) in each raceway to fill all voids around

conduit and cables. Upsize the conduit as needed for suitable sealing bushing.

E. Outlet Boxes:
   1. Consider location of outlets shown on drawings as approximate only. Study architectural, process piping, mechanical, plumbing, structural, roughing-in, etc., drawings and note surrounding areas in which each outlet is to be located. Locate outlet so that when fixtures, motors, cabinets, equipment, etc., are placed in position, outlet will serve its desired purpose. Where conflicts are noted between drawings, contact Owner's Representative for decision prior to installation. Comply with the NEC relative to position of outlet boxes in finished ceilings and walls.
   2. Prior to installation, relocate any outlet location a distance of 5 feet (152.4 cm) in any direction from location indicated on drawings if so directed by the Owner's Representative. Prior to completion of wall construction, adjust vertical height of any outlet from height indicated if so directed by Owner's Representative. The above modifications shall be made at no additional cost to the Owner.
   3. Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Outlet boxes shall be sized to accommodate the wiring, splices and device(s) to be installed in accordance with the NEC.
   4. Saw-cut opening for boxes recessed in masonry walls in center of cell of masonry block, and install box flush with surface of wall. Box shall have extra-deep type raised tile covers or shall be 3-1/2 inch (89 mm). deep boxes with square corners and dimensions to accommodate conductors installed. Prepare block surfaces to provide a flat surface for a raintight connection between box and coverplate or supported equipment and box, whether installed indoors or outdoors.
   5. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
   6. Locate boxes so that cover or plate will not span different building finishes. Install a device cover plate over each and every outlet indicated on drawings. Do not install plates until painting, cleaning and finishing of surfaces surrounding the outlet are complete. Install single one-piece multi-gang covers over multi-gang devices.
   7. Where outlets at different mounting heights are indicated on drawings adjacent to each other (due to lack of physical space to show symbol on drawings), install outlets on a common vertical line.
   8. Where switch outlets are shown adjacent to strike side of door, locate edge of outlet box approximately 3 inch (76.2 mm). from door frame.
   9. Support boxes in recessed ceilings independent of ceiling tiles and ceiling grid.
   10. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for purpose.
   11. Fasten junction and pull boxes to, or support from, building structure. Do not support boxes by conduits.
   12. Floor outlet boxes shall be installed flush with finished floor, adjust level and tile as required. Where finished floor is terrazzo, provide boxes specifically designed for installation in terrazzo. Where floors are to receive carpet or flooring material, coordinate with appropriate trade and provide insert. Rectangular covers shall be parallel and perpendicular with the building or, if used, floor tile/floor joints/pattern. Coordinate cover type with the flooring and device type.
   13. Outlet boxes installed in plaster, gypsum board or wood paneled hollow cavity walls shall be installed flush with raised plaster covers or raised tile covers. Boxes shall be mechanically fastened and supported by two (2) adjacent structural members (studs) with cross brackets (Garvin Industries Model BMB or approved equal).
   14. Surface ceiling mounted outlet boxes shall be minimum 4 inch (101.6 mm). square, 1-1/2 inch (38 mm). deep, galvanized sheet metal.
   15. Surface wall mounted outlet boxes shall be cast type boxes.
   16. Do not install aluminum boxes, enclosures, or fittings in contact with concrete or earth.

17. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.
18. Seal openings and knockouts in back and sides of boxes and enclosures with acoustically rated putty for boxes and enclosures in areas of walls with acoustical requirements. Provide gaskets for wallplates and covers.
19. Seal openings and knockouts in back and sides of boxes and enclosures in areas of walls with lead shielding requirements.

F. Wiring Methods:
1. Conductors shall not be installed until raceway system, including all outlets, cabinets, bushings and fittings, is completed. Verify that all work of other trades which may cause conductor damage is completed. Use only U.L. approved cable lubricants when necessary. Do not use mechanical means to pull conductors No. 8 or smaller.
2. In general, conductors shall be the same size from the last protective device to the load.
3. Wiring systems shall be properly grounded and continuously polarized throughout, following the color-coding specified. Connect branch circuit wiring at panelboards, as required, in order to provide a "balanced" three-phase load on feeders.
4. Provide insulated green ground conductor in each branch circuit.
5. All feeder connections shall be made to bus and other equipment using solderless, pressure type terminal lugs.
6. Branch circuits connected to a 20A circuit breaker shall be sized as indicated except for lengths exceeding 75 feet (2286 cm) For circuits longer than 75 ft. to 100 feet (3048 cm) utilize No. 10 AWG conductors (line, neutral and ground) and for circuits from 100 ft. to 150 feet (4572 cm) utilize No. 8 AWG (line, neutral and ground) unless otherwise indicated. Conduit size shall be modified in accordance with the NEC.
7. For splices and taps, No. 10 AWG and smaller, use solderless "twist on" connectors having spiral steel spring and insulated with a vinyl cap and skirt.
8. For splices and taps, No. 8 and larger, use insulated solderless set screw AL/CU or hydraulically compressed sleeve fittings suitable for the intended use.
9. Use cast connections for ground conductors.
10. Provide minimum 6 inch (152.4 mm). of spare/slack of each conductor in each junction or pull box and termination.
11. Make all splices and connections in accessible boxes and cabinets only.
12. Cover uninsulated splices, joints, and free ends of conductor with rubber and friction tape of PVC electrical tape. Plastic insulating caps may serve as insulation. Heat shrink sleeves shall be acceptable for crimp type splices.
13. On termination at branch circuit outlets, leave a minimum of 8 inch (203.2 mm). free conductor for installation of devices and fixtures.
14. Feeder conductors shall be continuous from point of origin to load termination without splice. If this is not practical, contact the Owner's Representative and receive written approval for splicing prior to installation of feeder(s). Where feeder conductors pass through junction and pull boxes, bind and lace conductors of each feeder together. For parallel sets of conductors, match lengths of conductors as near equal as possible.
15. Branch circuit conductors installed in panelboards, and control conductors installed in control cabinets and panels shall be neatly bound together using "Ty-Raps" or equal.
16. Lighting fixtures, detectors, etc., in mechanical equipment, boiler and pump rooms shall be installed with exposed wiring after equipment, ductwork, piping, etc., are in place. In general, lighting shall be as located on the drawings; where conflicts exist, locate lights for best distribution.
17. Provide cable/conductor vertical support in accordance with the NEC.
18. Manholes/Handholes:
    a. All cables operating at 1,000 volts to ground and above shall be arc proofed using a fire retardant arc proofing tape installed per manufacturer's instructions.

b. Provide cable racks, and securely fasten all cables. Support stanchions shall be spaced 3 feet (91.44 cm) apart maximum.
c. Provide separation of conductors of different systems per NEC requirements.
d. Pitch all raceways toward the manhole/handhole.
e. Mortar and brick the throats of manholes/handholes to grade level. Set cover rim to 1 inch (25.4 mm). above grass areas and flush with finished areas. Waterproof throat with elastic bituminous plastic cement coating.

G. Receptacles:
1. Ground opening shall be up for vertical installation and on the left for horizontal installation.

H. Toggle Switches:
1. Switches shall be installed in accessible locations near room/space entryway(s).
2. Provide lighted handle switches in mechanical rooms, elevator pits, electric rooms, etc.
3. Switches shall have neutral pulled through the box even if not used.

I. Junction and Pull Boxes:
1. Install junction and pull boxes in readily accessible locations. Access to boxes shall not be blocked by equipment, piping, ducts and the like. Provide all necessary junction or pull boxes required due to field conditions and size as require by the National Electrical Code.

J. Equipment Mounting Heights:
1. Unless otherwise noted, mount devices and equipment at heights measured from finished floor to device/equipment centerline as follows:

| | | |
|---|---|---|
| a. | Toggle switches (up position "on") | 46 inch (1168.4 mm). |
| b. | Wall lighting controls (dimmer, digital switch, etc. | 46 in. |
| c. | Receptacle outlets (long dimension vertical, ground" pole farthest from floor) | 18 inch (457.2 mm). |
| d. | Receptacle outlets above counters | 8 inch (203.2 mm). above counters |
| e. | Receptacle outlets, above hot water or steam baseboard heaters. Do not install receptacle outlets above electric baseboard heaters | 30 inch (762 mm). |
| f. | Receptacle outlets, hazardous areas; also for refrigerators | 48 in. |
| g. | Receptacle outlets, weatherproof, above-grade | 24 inch (609.6 mm). |
| h. | Telephone outlets | 18 in. |
| i. | Telephone outlets, wall mounted | 46 in. |
| j. | T.V. outlet | 18 in. |
| k. | Fire alarm manual stations | 46 in. |
| l. | Fire alarm combination audio/visual and standalone visual device (entire strobe lens at heights indicated) | 80 inch (2032 mm). to bottom of the notification device |
| m. | Standalone fire alarm audio device | 90 inch (2286 mm). (min) to 96 inch (2438.4 mm). (max) |

| | | |
|---|---|---|
| n. | Distribution panelboards, to top of backbox | 72 inch (1828.8 mm). |
| o. | Terminal cabinets, control cabinets, to top of backbox | 72 in. |
| p. | Disconnect switches, motor starters, enclosed circuit breakers. | 48 in. |

2. Where structural or other interferences prevent compliance with mounting heights listed above, consult Owner's Representative for approval to change location before installation.

K. Hangers and Supports:
1. Provide steel angles, channels and other materials necessary for the proper support and erection of motor starters, distribution panelboards, large disconnect switches, large circuit breakers, pendant mounted lighting fixtures, etc.
2. Panelboards, disconnect switches, circuit breakers, cabinets, large pull boxes, adjustable speed drives, cable support boxes and starters shall be secured to the building structure and not supported from conduits. Small panelboards, etc., as approved by Owner's Representative, may be supported on walls. Racks for support of conduits and heavy electrical equipment shall be secured to building construction by substantial structural supports.

L. Identification:
1. Provide engraved lamicoid identification nameplates on switchboards, main service disconnects, transfer switches, motor control centers and on all panelboards using designation shown in panelboard schedule. Include voltage, phase, equipment served, voltage source to panel or equipment.
2. Provide engraved lamicoid identification nameplates for each circuit breaker in the main distribution panel listing the panelboard or equipment connected to each device.
3. Provide engraved lamicoid identification nameplates on all items of equipment including individual circuit breaker enclosures and disconnect switches, listing the equipment connected to the particular device provided under Specification Section 262000, including, but not limited to: starters, disconnect switches, adjustable speed drives, circuit breakers, etc. Include voltage, phase, equipment served, voltage source to panel or equipment.
4. Provide complete type written directory for each panelboard listing room number, function, etc., for each circuit breaker. Directory shall be placed in a plastic clear sleeve in the interior of the panelboard door.
5. Identify junction and pullboxes for particular service and circuit such as power, emergency power, lighting, fire alarm, telephone, interphone, public address, nurse call, etc. using stencil lettering on cover.
6. Using adhesive backed printed tape label (white background, black lettering) all receptacle and switch coverplates, power poles, etc. listing panel designation and circuit number. Tape shall be attached to inside of receptacle or switch coverplates.

M. Spare Parts:
1. Deliver to Owner and obtain receipt for spare parts including key switches, fuses, etc.

**3.02 TESTS**

A. Branch circuits shall be tested during installation for continuity and identification and shall pass operational tests to determine that all circuits perform the function for which they are designed. For all feeder and exterior branch circuit wiring rated 600 volts or less, provide 1,000 volt "Megger" insulation test prior to energizing feeders. Use a 1,000-volt motor driven megger for all tests. Test voltage shall be applied until readings reach a constant value, and until three (3) equal readings, each one (1) minute apart, are obtained. Minimum megger reading shall be 45 megohms for feeder conductors. Document test results and submit for approval prior to energizing conductors.

**END OF SECTION 26 05 01**

**SECTION 26 05 26**
**GROUNDING**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

### 1.02 DESCRIPTION

A. Provide grounding system equal to or exceeding the requirements of NEC and as indicated in the contract documents. Raceway system which includes metal conduit, wireways, pullboxes, junction boxes, busway, wire ways, cable trays, enclosures, motor frames, etc., shall be made to form a continuous, conducting permanent ground circuit of the lowest practical impedance to enhance the safe conduction of ground fault currents and to prevent objectionable differences in voltage between metal nonload current carrying parts of the electrical system.

B. Provide solid grounding of building structures and electrical and communications systems and equipment. It includes basic requirements for grounding for protection of life, equipment, circuits and systems. Types of grounding systems include the following:
   1. Electrical Service and Transformer Grounding
   2. Building Grounding
   3. Equipment Room Ground Terminal Bar
   4. Electrical Equipment Grounding
   5. Surge Protection Device (SPD) Grounding
   6. Telecommunications Grounding
   7. Equipotential Grounding Systems
   8. Underground Distribution Grounding

### 1.03 QUALITY ASSURANCE

A. All methods of construction, details of workmanship, that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions. etc., correspond to the nomenclature dictated by those manufacturers. Where "or equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval. All equipment shall be tested at the factory. Unless specified elsewhere, standard factory inspection and operational tests will be acceptable.

B. Electrical Components, Devices and Accessories: Listed and labeled as defined in the NEC by Nationally Recognized Testing Laboratory (NRTL) and marked for intended use.

C. Comply with UL 467 for grounding and bonding materials and equipment.

### 1.04 REQUIREMENTS

A. Grounding conductors, bonding conductors, jumpers, grounded conductors, etc. shall be sized in accordance with the NEC.

B. Equipment and materials shall be installed in accordance with the manufacturer's recommendations.

C. Provide ground system coordinated with and in accordance with the utility company requirements.

### 1.05 SUBMITTALS

A. Provide submittals for the following:
   1. Ground rods and connectors.
   2. Ground bars.
   3. Building ground resistance test results.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

A. Conductors:
   1. Exposed grounding components such as bars, straps, cables, flexible jumpers, braids, shunts, etc., shall be bare copper unless otherwise indicated.
   2. Grounding conductors in raceway with 600V circuiting shall be insulated to match the circuit conductors with green color.
   3. Grounding conductors used with system voltage greater than 1000V shall be bare unless otherwise indicated.
   4. Grounding conductor size shall be as indicated or as required by the NEC whichever is larger, stranded, soft drawn or soft annealed copper, unless otherwise indicated. Sizing shall take into account circuit voltage drop.
   5. Acceptable Manufacturers:
      a. Same make as for 600 volt conductors.

B. Ground Rods:
   1. Provide solid copper or copper clad steel cylindrical rods, 3/4 in. minimum diameter and minimum 10 ft. long with pointed end. Provide units suitable for extension connection when ground rods longer than 10 ft. are indicated.
   2. Acceptable Manufacturers:
      a. Copperweld
      b. Erico
      c. Burndy
      d. Approved equal.

C. Connectors, Clamps and Terminals:
   1. Mechanical connectors and clamps shall be made of copper alloy or silicon bronze. Solderless compression terminals shall be copper, long-barrel, NEMA two bolt. Bolts and washers (Belleville) shall be of comparable material or stainless steel.
      a. Acceptable Manufacturers:
         1) Burndy
         2) Hubbell Anderson Corp.
         3) Thomas & Betts
         4) Approved equal
   2. Exothermic Welds:
      a. Provide exothermic welds designed for size and type of intended cable, rods, structure, etc. Solder prohibited for connections, except for medium and high voltage cable metallic tape shields (utilize mechanical and solder).
      b. Acceptable Manufacturers:
         1) Erico "Cadweld"
         2) Burndy "ThermOweld"
         3) Approved equal
   3. Pipe Clamp:
      a. Pipe clamp for bonding to pipe type electrode (water pipe, etc.) shall be a suitably sized copper alloy clamp.
      b. Acceptable Manufacturers:
         1) Burndy GAR-BU
         2) O-Z Gedney Type CG
         3) Burndy "Durium"
         4) AFL Global "Everdur"
         5) Approved equal
   4. Flexible Strap:
      a. Flexible grounding straps shall be of braided high conductivity copper with two hole connector. Strap shall have equal to or greater than ampacity of the system it is

bonding to. Strap shall provide flexibility in all directions when installed properly.

b. Acceptable Manufacturers:
   1) Burndy
   2) OZ Gedney
   3) Approved equal

5. Electrostatic Floor Bonding:
   a. Listed grounding kit for bonding ESD carpet, vinyl, rubber and epoxy floor coverings and coatings to ground with the following components:
      1) 1 in. wide copper grounding tape.
      2) Heavy gauge stainless steel ground termination plates with double sided conductive tape and 20 in. long lead wire with a #10 terminal ring at the end.
      3) Acceptable Manufacturers:
         (a) Ground Zero Electrostatics Inc. "Zerostat" Floor Termination and Grounding Kits.

D. Ground Bars
1. Provide ground bars where indicated. Ground bars shall be:
   a. 98% conductive copper, minimum.
   b. 4 in. x 1/4 in. thick minimum with length as indicated with minimum 36 in. for electric room/MDF and all other minimum of 24 in.
   c. Standard NEMA bolt hole patterns with maximum quantity of lug locations. Spacing of 1-1/8 in. apart.
2. Bar shall be mounted to an accessible wall location with galvanized steel hardware and 2000V rated insulators. Mounting shall be suitable for full complement of cabling.
3. Unit shall conform to EIA/TIA standards.
4. Acceptable Manufacturers:
   a. Erico
   b. Newton Instrument
   c. Burndy
   d. Harger

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Grounding Conductors:
1. Provide grounding conductor(s) with all power circuits. Conductor shall be sized as indicated or as required by the NEC as a minimum and shall be terminated on the equipment, device, enclosure, etc. grounding terminal.
   a. Conductor size shall be for the entire length unless approved by the Engineer where oversized for voltage drop.
2. Conductors above grade to ground electrodes (water piping, structural column, etc.) and to equipment (service entrance, ground bars, ground halos, etc.) shall be installed in metallic conduit with ends bonded to the conduit.
3. Grounding conductors shall be installed to have a minimum radius of 3 in.
4. Grounding conductors in a raceway system shall be terminated/bonded to each box, cabinet, enclosure, etc. through which it passes or terminates.
5. Grounding conductors routed with underground circuits shall be bonded to each ground electrode and metallic cable support system within the raceway system including pull and access locations.
6. Stranded conductors penetrating vapor barriers, foundations, slab on grade and water stop membranes shall have the interstitial spaces between strands filled with solder 4 in. beyond the membrane each side. The conductor shall be sealed to the membrane with a manufacturer approved method.

B. Raceway Systems:

1. All metal supports, cable trays, messenger cables, frames, sleeves, brackets, braces, etc. for the raceway system, panels, switches, boxes, starters controls, etc., which are not rigidly secured to and in contact with the raceway system, or which are subject to vibration and loosening, shall be bonded to the raceway system.
2. Termination of rigid conduit at all boxes, cabinets, and enclosures shall be made up tightly with a double locknut arrangement and a bushing, bushings being of the insulated type. Utilize grounding bushings as specified elsewhere in these specifications.
3. Conduit which runs to or from boxes, cabinets, or enclosures having concentric or eccentric knockouts which partially perforate the metal around the conduit and hence impair the continuity of system ground circuits shall be provided with bonding jumpers connected between a grounding type bushing/locknut on the conduit and a ground bus or stud inside the box, cabinet, or enclosure and attached thereto.
4. Conduit expansion joints and telescoping sections of metal raceways shall be provided with bonding jumpers sized in accordance with the NEC.

C. Ground Rods:
1. Ground rods shall be driven vertically the full length plus 24 in., minimum.
2. Ground rods shall be located in virgin soil or loamy compacted soil.
3. Provide one (1), minimum, ground rod inspection test well for each ground rod/electrode system or as indicated.

D. Connectors Clamps and Terminals:
1. Connectors utilized above grade in dry accessible locations shall be mechanical or exothermic type.
2. Connectors in damp locations, below grade or if not indicated shall be exothermic type.
3. Clean the area near the connecting surfaces prior to any connection to ensure effective contact. Cleaning shall be to the bare metal. Wire brush area if needed to remove rust scale paint, dirt, etc. to expose bare metal.
4. Exothermic connections shall be installed in accordance with the manufacturer's recommendations and tested with heavy blow of a five pound sledge.

E. Flexible Strap:
1. Flexible straps shall be used when bonding vibrating/moveable equipment, with expansion fittings and where recommended by the manufacturer.
2. Sufficient slack shall be provided to compensate for the anticipated vibration, movement and expansion.

F. Ground Grid:
1. Provide a ground electrode grid consisting of a minimum of three (3) 10 ft. ground rods arranged in a delta configuration with a minimum spacing of 20 ft. apart and connected together.
2. Connecting conductors shall be bare #4/0 AWG minimum, buried a minimum of 24 in. below grade.
3. Connect the ground grid to the building electric service and to the main ground bar.

G. Secondary Electrical Systems:
1. The neutral (grounded) conductor of each low voltage, single and/or polyphase system or distribution system, except special isolated double insulated systems, shall be solidly connected to ground at the transformer neutral bushing, or at the main secondary switchgear to the system ground, and shall be sized for current carrying capacity, not to be less than as required by the NEC. Ground connection shall be to the building grounding system, building steel, building water service, building concrete reinforcement and as indicated.
2. Provide equipment grounding conductor, green colored insulation, with phase conductors, to primary side of all transformers rated 600 volts or less circuited to the enclosure and secondary neutral bushing, to all electrical utilization and distribution equipment; insulation shall be same type as phase conductors. Transformer enclosures shall be bonded to the primary and secondary circuit grounding conductor.

3. Equipment grounding conductors shall extend from the point of termination back to the ground bus of the source panelboard, switchboard, transformer, or switchgear.

H. Equipment Grounding:
   1. Surge Protection Device (SPD) Ground Conductor Installations: Extend SPD dissipation ground conductors to local equipment ground bus and to common grounding electrode conductors. Size conductors per SPD manufacturer recommendations and the NEC.
   2. Towers and Antennas:
      a. Ground Ring: Buried at least 30 in. below grade and at least 24 in. from the base of the tower or mounting.
      b. Bond each tower base and metallic frame of a dish to the ground ring, buried at least 18 in. below grade.
      c. Bond the ground ring and antenna grounds to the equipment room TMGB or TGB, buried at least 30 in. below grade.
      d. Bond metallic fences within 6 ft. of towers and antennas to the ground ring, buried at least 18 in. below grade.
      e. Special Requirements for Roof-Mounted Towers:
         1) Roof Ring: Meet requirements for the ground ring except, the conductors shall comply with requirements in Section 264113 "Lightning Protection".
         2) Bond tower base footings steel, the TGB in the equipment room and antenna support guys to the roof ring.
      f. Waveguides and Coaxial Cable:
         1) Bond cable shields at the point of entry into the building to the TGB and to the cable entrance plate, using No. 2 AWG bonding conductors.
         2) Bond coaxial cable surge arrester to the ground or roof ring using bonding conductor size recommended by surge arrester manufacturer.

I. Communications Rooms:
   1. For each building communications room or closet provide one (1) wall mounted ground bar bonded to the main building ground bar or electrical service ground with insulated #2/0 AWG conductor.
   2. Local cable trays, equipment racks, etc. shall be bonded to the ground bar with insulated #6AWG minimum.

J. Generators with Three Pole Transfer Switch(es):
   1. Generator neutrals are not to be bonded to ground at the generator.
   2. Generator neutral shall be connected to the secondary electrical distribution system neutral conductor or bus. Connection shall be made at the transfer switch neutral lug.
   3. Generator frames shall be bonded to the ground system with a conductor sized in accordance with the NEC.

K. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors in conduit from building's main service equipment or grounding bus to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes using a bolted clamp connector or by bolting a lug-type connector to a pipe flange using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

L. Power Company Requirements:
   1. Provide ground conductor from service entrance equipment to meter panel, sized per utility company requirements.
   2. One size 3/4 in. diameter by 10 ft. ground rod and size #6 circuitry at riser pole.

3. Meet power company requirements.

M. Underground Distribution:
   1. Manholes and Handholes: Provide a driven ground rod through opening in the floor/bottom with 4 in. exposed. If necessary due to the site conditions, install the ground rod prior to manhole/handhole installation and provide a #1/0AWG bare conductor from the ground rod with an exothermic connection in the manhole/handhole. Seal the opening with waterproof nonshrinking grout.
   2. Bond exposed parts within manhole/handhole such as inserts, pulling rings, cable racks, ladders and cable shields to the ground rod with #2AWG bare conductor minimum. Conductors shall be neatly installed around the perimeter of the unit and support 3 ft. on center with non-corrosive support and hardware.

**3.02 GROUND TERMINAL BUS INSTALLATION**

A. Install ground terminal bar in rooms where shown on the drawings. Mount bar 18 in. above finished floor by anchors and bolts using 1-1/2 in. long insulated spacer between bar and wall. Use a minimum of two (2) supports 18 in. on center. Connect all grounding electrode system conductors, system enclosure ground bus, and other indicated electrode systems to the terminal bar.

B. Label grounding conductors terminated to bus for equipment, location, electrode, etc served.

**3.03 TELECOMMUNICATIONS SIGNAL GROUNDING SYSTEM INSTALLATION**

A. Install a complete telecommunications grounding electrode system with room grounding buses, grounding electrodes and interconnecting cables per ANSI/EIA/TIA-607A.

B. Bond metallic telecommunications pathways (e.g. conduit, sleeves, cable trays, fire-rated assemblies, etc.) to ground. Use structural steel where available. When a bonding conductor is installed in metallic conduit, the bonding conductor must be bonded to the conduit at both ends.

C. All exterior/underground terminals shall be made with exothermic welds or compression connectors.

D. Signal and Communication Equipment: For telephone, alarm, voice and data and other communication equipment, provide #4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet and central equipment location.
   1. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

**3.04 TESTS**

A. Test the building ground system before backfilling to ensure continuity and determine system resistance value.

B. Testing procedure shall be a fall of potential type with a moving auxiliary electrode in accordance with IEEE Standard 142 and reviewed/approved by the Engineer. Sufficient test points shall be taken for accurate resistance value.

C. Make resistance measurements in dry weather, no earlier than 48 hours after rainfall. Provide tabulated test results indicating distance between rods and resistance readings on a plotted graph.

D. Test each ground electrode system separately prior to connection to the system or main building ground bar. Test each system ground electrode system a second time after backfilling has occurred and all final connections (building steel, water service, etc.) have been made.

E. Soil type, date, time, meter manufacturer/model number, person performing the test, test witnesses and most recent rainfall shall be noted in test submittal.

**END OF SECTION 26 05 26**

## SECTION 26 05 27
## GROUNDING AND BONDING FOR BUILDING STRUCTURE

### 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 rod electrodes.

E. Ground enhancement material.

### 1.02 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Notify Architect 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 30 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

C. Shop Drawings:
   1. Indicate proposed arrangement for signal reference grids. Include locations of items to be bonded and methods of connection.

D. Project Record Documents: Record actual locations of grounding electrode system components and connections.

### 1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

### PART 2 PRODUCTS

### 2.01 GROUNDING AND BONDING FOR BUILDING STRUCTURE

A. (26.0527.00) Building grounding grid system.

B. (26.0527.01) Building grounding grid system minimum 1/0 bare AWG stranded copper ground wiring.

C. (26.0527.02) Building grounding grid system 5/8" diameter copper ground rod at 50' intervals maximum.

D. (26.0527.03) Building grounding grid system exothermic weld connection

E. (26.0527.04) Building grounding grid system approved bonding strap / jumper exothermically welded to building steel as shown.

## 2.02 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. 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.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Ground Ring:
      a. Provide a ground ring encircling the building or structure consisting of bare copper conductor not less than 2 AWG in direct contact with earth, installed at a depth of not less than 30 inches (750 mm).
      b. Where location is not indicated, locate ground ring conductor at least 24 inches (600 mm) outside building perimeter foundation.
      c. Provide ground enhancement material around conductor where indicated.
      d. Provide connection from ground ring conductor to:
         1) Perimeter columns of metal building frame.
         2) Ground rod electrodes located as indicated.
   3. Ground Rod Electrode(s):
      a. Provide single electrode unless otherwise indicated or required.
      b. Space electrodes not less than 50 feet (15.25 m) from each other and any other ground electrode.
      c. Where location is not indicated, locate electrode(s) at least 2 feet outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
   4. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.

## 2.03 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 05 26:
   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 exothermic welded connections for accessible connections.
4. Manufacturers - Exothermic Welded Connections:
   a. Burndy LLC: www.burndy.com/#sle.
   b. Cadweld, a brand of Erico International Corporation: www.erico.com/#sle.
   c. thermOweld, subsidiary of Continental Industries; division of Burndy LLC: www.thermoweld.com/#sle.

D. Ground Rod Electrodes:
1. Comply with NEMA GR 1.
2. Material: Copper-bonded (copper-clad) steel.
3. Size: 5/8 inch (16 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.

E. Ground Enhancement Material:
1. Description: Factory-mixed conductive material designed for permanent and maintenance-free improvement of grounding effectiveness by lowering resistivity.

## 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.

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.

E. Identify grounding and bonding system components in accordance with all applicable codes.

F. Bond new ground grid to existing ground grid.

### 3.03 BUILDING GROUNDING SYSTEM

A. All work shall, as a minimum, be performed in strict accordance with Article 250 of the National Electric Code, latest edition.

B. Grounding Grid:

1. Furnish and install an embedded ground loop around the entire building perimeter with connections to perimeter ground rods. Footing reinforcing bars and building structural steel to form a grounding grid. The ground loop shall be a minimu of 1/0 AWG bare, stranded copper wire located 1' - 6" outside of the building foundation and a minimum of 2' - 0" below finished grade.

C. Resistance Requirements:
   1. The grounding grid shall establish a resistance of less than or equal to 10 ohms to ground. Resistant level shall be consistent throughout the building grounding system. The Electrical Contractor shall perform any and all necessary modifications to the grounding system as might be necessary to achieve the required 10 ohms maximum resistance to ground and shall, without exceptions, provide the results of the all earth resistance measurements tests to owner and agents.

D. Ground Grid Components:
   1. Provide a 10' - 0" (minimum length) by 5/8" copper plated steel ground rod, driven at 50' - 0" intervals along the ground loop, with the top of the rod at the same depth as the ground loop. At 250' - 0", lengthen the ground rod to reach grade level and provide a heavy duty testing well load rated to meet AASHTO "Standard Specification for Highway Bridges" (Latest Edition)) for H-20 load rating.
      a. Connections between the ground loop and ground rods shall be by exothermic welds without exception. Mechanical connectors are prohibited.
   2. Provide a minimum 1/0 AWG bare, stranded copper wire from the ground loop to the lowest level of footing reinforcing bars at maximum 100' - 0" intervals around the perimeter of the building.
      a. Connections between the ground loop and reinforcing steel shall be by exothermic welds without exception. Mechanical connectors are prohibited.
   3. Structural ground conductors shall be installed at every other building perimeter column and shall be 1/0 AWG Bare, stranded copper wire installed in 1 inch galvanized rigid steel conduit with grounding bushings where conductors penetrate the foundation and / or finished slab.
      a. Structural grounding conductors shall be, without exception, by exothermic welds to the web of the steel columns at points located 1' - 6" above the finished floor. Mechanical connectors are prohibited.

E. Testing:
   1. Note: Depending upon the results of the earth resistivity tests described below, the contractor might need to increase the minimum ground rod lengths to 20' - 0" to achieve the required resistance.
   2. Pre-Installation testing:
      a. Prior to the installation of the grounding grid, the contractor shall obtain earth resistivity tests on the project site in close horizontal and vertical proximity to the location of the future loop. Earth resistivity testing shall not be performed within five (5) days after a rainfall.
      b. The Earth Resistivity Test shall be performed using the "Wenner 4 - Point" method, and shall be conducted using a Dranetz brand, Model 4160 or Model 4500 Ground Resistance Testing Device. Measurements shall be obtained at 10' - 0" and 20' - 0" probe spacing. Provide, without exception, written test reports to owner before proceeding with the installation of the loop.
   3. Post-Installation Testing:
      a. Upon completion of the ground loop, connections to footing reinforcing bars and ground rods, backfilling and compaction of the site and prior to placement of any pavement sub-base material or landscaping topsoil; the contractor shall perform earth resistivity tests employing the "Fall of Potential Method". Ground resistance testing shall not be performed with five (5) days after a rainfall. Results of the earth resitivity tests shall be provided to owner.

### 3.04 FIELD QUALITY CONTROL

A. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

B. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

**END OF SECTION 26 05 27**

**SECTION 26 20 00**
**ELECTRIC DISTRIBUTION**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. IEEE 1584 - IEEE Guide for Performing Arc-Flash Hazard Calculations; 2018, with Errata (2019).

B. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.

C. NFPA 70E - Standard for Electrical Safety in the Workplace; 2024.

D. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

### 1.02 DESCRIPTION

A. Provide electric distribution equipment as indicated on the Contract Documents and as specified herein.

### 1.03 QUALITY ASSURANCE

A. All methods of construction, details of workmanship, that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc., correspond to the nomenclature dictated by those manufacturers. Where "or equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval. All equipment shall be tested at the factory. Unless specified elsewhere, standard factory inspection and operational tests will be acceptable.

B. Installation shall be in accordance with NFPA-70 (National Electrical Code), National Electrical Safety Code (NESC), state codes, local codes, and requirements of authority having jurisdiction.

C. Equipment shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of applicable published ANSI, NEMA, UL and IEEE Standards.

### 1.04 SUBMITTALS

A. Submit the following product data/information:
   1. Manufacturer and equipment type.
   2. Standard catalog information sheet.
   3. Detailed shop drawings indicating plan, elevation, end and isometric views. Top and bottom conduit areas shall be clearly shown and dimensioned on the drawings.
   4. Single-line diagram.
   5. Complete Bill of Materials.
   6. All relevant ratings including, but not limited to, voltage, current, interrupting and withstand.
   7. Overcurrent Device Information. Model number, available settings, setting ranges, capabilities, etc.
   8. Submit available and final settings, programming and adjustments.

B. Submit product data and information for the following equipment, materials, products, etc.:
   1. Distribution and Branch Circuit Panelboards
   2. Circuit Breakers
   3. Switches.
   4. Surge Protective Devices
   5. Fuses

C. Test Reports
   1. Submit type written test report for all testing indicated herein.

## 1.05 WARRANTY

A. Provide full system warranty (labor, travel, equipment, etc.) in accordance with Division 1 and a minimum of one (1) year from acceptance.

## PART 2 – PRODUCTS

## 2.01 DISTRIBUTION PANELBOARD

A. Provide distribution panelboards as indicated in the “Panelboard Schedule” and as located on the drawings. Panelboards shall be equipped with quick make/quick break thermal magnetic, molded case circuit breakers as scheduled. Shall be NRTL listed for use as service entrance equipment where used at the service entrance.

B. Panelboard bussing and lugs shall be copper. Provide full sized neutral equipped with full capacity bonding strap for service entrance applications and mount electrically isolated from enclosure. Provide neutral bus rated 200 percent of phase bus where indicated on drawings, connectors shall be sized for double sized or parallel conductors. Provide grounding bus in each panelboard, securely bonded to the box. Panelboard bus structure, main lugs, and main breaker shall have current ratings as indicated. Such ratings shall be established by heat rise tests with maximum hot spot temperature on any connector or bus bar not to exceed 50□C rise above ambient.

C. Circuit breakers shall be equipped with individually insulated, braced and protected connectors. Large permanent, individual circuit numbers shall be affixed to each breaker in a uniform position. Tripped indication shall be clearly shown by the breaker handle taking a position between “ON” and “OFF”. Provisions for additional breakers shall be such that no additional connectors will be required to add breakers.

D. Each panelboard, as a complete unit shall have a short circuit rating equal to or greater than the rating shown on the Panelboard Schedule. All panelboards shall be fully rated. “Series Ratings” are NOT acceptable. The use of series rating of panelboards for short circuit rating is not acceptable.

E. Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be as specified in UL Standard 50 for cabinets. The size of wiring gutters shall be in accordance with UL Standard 67. Cabinets shall be equipped with locks and all locks shall be keyed alike. End walls shall be removable. Fronts shall be of code gauge, full-finished steel with rust-inhibiting primer and baked enamel finish.

F. The panelboard interior assembly shall be dead front with panelboard front removed. Panelboard front shall be door in door construction with full length piano-hinge. Main lugs or main breakers shall be barriered on five (5) sides. The end of the bus structure opposite the mains shall be barriered.

G. Panelboards shall be UL listed for use intended.

H. Ratings shall be as indicated in the contract documents.

I. Manufacturers: Subject to compliance with contract documents, the following manufacturers are acceptable:
   1. Square D “I-Line” - Design Make
   2. Eaton Corporation “PRL3”
   3. ABB ReliaGear “10ext”
   4. Siemens

## 2.02 BRANCH CIRCUIT PANELBOARD (208Y/120 VOLT):

A. Provide branch circuit panelboard as indicated in the “Panelboard Schedule” and as located on the drawings. Panelboards shall be equipped with quick make/quick break thermal-magnetic, molded case circuit breakers as scheduled.

B. Panelboard bussing and lugs shall be copper. Provide full sized neutral equipped with full capacity bonding strap for service entrance applications and mount electrically isolated from enclosure. Provide neutral bus rated 200 percent of phase bus where indicated on drawings

with connectors shall be sized for double sized or parallel conductors. Provide grounding bus in each panelboard, securely bonded to the box. Panelboard bus structure and main lugs or main circuit breaker shall have current ratings as indicated. Such ratings shall be established by heat rise tests, conducted in accordance with UL Standard 67.

C. Provisions for additional circuit breakers shall be such that field addition of connectors or mounting hardware will not be required to add circuit breakers to the panelboard. Bus connections shall be bolt-on.

D. Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the rating shown on the Panelboard Schedule or on the plans. All panelboards shall be fully rated. “Series Ratings” are NOT acceptable. Reducing breaker ratings on the basis of series rating is not acceptable.

E. The panelboard bus assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be specified in UL Standard 50 cabinets. Wiring gutter space shall be in accordance with UL Standard 67 for panelboards. Each front shall include a door and have a flush, stainless steel, cylinder type lock with catch and spring-loaded door pull. All panelboard locks shall be keyed alike. Doors shall be mounted by completely concealed steel hinges. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. Fronts shall be of code gauge, full-finished steel with rust inhibiting iron phosphate sealer and baked enamel finish. Minimum box width shall be 20 in. Provide door-in-door construction.

F. Panelboards with main circuit breaker shall have inherent and listed coordination of the main and branch circuit breakers.

G. Ratings shall be as indicted on the Panelboard Schedule.

H. Manufacturers: Subject to compliance with Contract Documents, the following manufacturers are acceptable:
   1. 208Y/120 Volt:
      a. Square D “NQ” - Design Make
      b. Eaton Corporation “PRL1”
      c. ABB ReliaGear “RQ”
      d. Siemens

**2.03 CIRCUIT BREAKERS**

A. Circuit breakers shall be molded case constructed using glass reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

B. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes. Single pole 15 and 20 ampere circuit breakers shall be UL listed as “Switching Breakers” at 120V ac or 277 V ac and carry the SWD marking. Lugs shall be mechanical, rated for 60/75° AL/Cu.

C. Thermal Magnetic Circuit Breakers: Inverse time current element for low level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit breaker frame sizes 250A and larger.

D. Adjustable, Instantaneous Trip Circuit Breakers – Magnetic trip element with front mounted, field adjustable trip setting.

E. Electronic Trip Circuit Breakers (400A frame and above): 100% rated, RMS sensing, field replaceable rating plug or electronic trip, and front field adjustable settings for long time, long time delay, short time, short time delay, and instantaneous trip as indicated.
   1. Square D Micrologic trip unit - Design Make.

2. Eaton Corporation Optim 550 trip units for circuit breakers 400 – 1600 amp frame or RMS 610 trip units for 2000 amp frame to 6000 amp frame.
3. ABB Spectra RMS or MicroVersa trip unit.
4. Siemens Sentron Sensitrip III trip unit.

F. Handle Padlocking Device: Fixed attachment, for locking circuit breaker in on or off position.

G. Ground-Fault Circuit Interrupter (GFCI) circuit breakers shall be quick-make, quick-break, thermal-magnetic, Class A, 6 milliampere ground fault sensing and trip indicating, and multipole breakers shall have common trip. The ground fault circuit breakers shall not occupy any more space than a standard breaker of the same number of poles.

H. Ground Fault Equipment Protector (GFEP) circuit breakers shall be utilized for electric heating equipment and where indicated. These shall be quick-make, quick-break, thermal-magnetic, Class B, 30 milliampere ground fault sensing and trip indicating, and multipole breakers shall have common trip. The ground fault circuit breakers shall not occupy any more space than a standard breaker of the same number of poles.

I. Listed combination of coordinated circuit breakers shall be verified by the equipment manufacturer utilizing published data sheets. Confirmation listings shall be submitted.

J. Ratings shall be as indicated in the Contract Documents.

K. Enclosed circuit breakers shall be molded case, thermal-magnetic type, ratings as noted, with overcenter, trip-free, toggle-type operating mechanism, quick make/quick break action and positive handle indication. Multiple pole breakers shall be common trip type. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each phase. Provide provisions for padlocking in the “off” position. Breakers shall be calibrated for operation in an ambient temperature of 40□C and shall be suitable for mounting and operating in any position. Breakers shall have removable lugs, UL listed for copper and aluminum conductors. Breakers shall be installed in NEMA 1 general purpose, surface enclosures, unless otherwise noted.
   1. Manufacturers: Subject to compliance with Contract Documents, the following manufacturers are acceptable:
      a. Square D
      b. Eaton Corporation
      c. ABB
      d. Siemens

**2.04 SWITCHES**

A. Disconnect (Safety) Switches
   1. Shall be heavy-duty type three-pole, with “Quick Make/Quick Break” operating handle mechanically interlocked with the cover, horsepower and voltage rated to match equipment served. Where indicated switches shall be provided with dual-element, time delay, rejection type fuses. Switches shall be installed in NEMA 1 for indoor use, NEMA 4 for outdoor use. Provide provisions for padlocking in the “off” position. Provide neutral bar in single phase or three phase, four wire circuits, and ground bar in all switches. Provide auxiliary contacts where called for.
   2. All disconnects connected downstream of ASD’s shall have a normally open and normally closed auxiliary contacts which shall be wired to the ASD to indicate disconnect is open.
   3. Manufacturers: Subject to compliance with Contract Documents, the following manufacturers are acceptable:
      a. Square D
      b. Eaton Corporation
      c. ABB
      d. Siemens

## 2.05 FUSES

A. All fuses rated 600 volts and below shall be rejection type dual-element, time-delay type. Provide two (2) complete sets of fuses for all fusible devices. Deliver spare fuses to the Owner and obtain receipt.

B. Manufacturers:
   1. Fuses 600 Amperes and Below: Type RK5, Bussman Type FRS-R (600 volts), Bussman Type FRN-R (300 volts) or equivalent.
   2. Fuses Rated Above 600 Amperes: Type L, Bussman Type KRP-C or equivalent.

## 2.06 SURGE PROTECTIVE DEVICE:

A. Device shall be rated for location as shown on drawings.

B. Seven Mode Protection: Line-to-neutral (three), line-to-ground (three) and neutral-to-ground.

C. Provide test report from a recognized independent testing laboratory verifying the Surge Protective Devices (SPD) can survive published surge current rating on both a per mode and per phase basis. ANSI/UL 1449, latest edition.

D. Surge Current Capacity – The minimum total surge current tested with the ANSI/IEEE C42.41, 20 kA-8/20 microsecond waveform that the device is capable of withstanding shall be as shown in the following table:

| | Application | Peak Surge Current Per Phase | Nominal Discharge Current – In Per Mode |
|---|---|---|---|
| a. | Type 1 – Before Service Entrance | 250 kA | 20 kA |

E. Unit shall comply with ANSI/UL-1449, latest edition. Voltage Protection Rating (VPR) per Mode must not exceed the following for Type 1 SPD:
   1. 208Y/120, L-N 700 volts, L-G 700 volts, N-G 800 volts, L-L 1000 volts.

F. UL-1283 bi-directional high frequency noise attenuation for electric line noise shall be 50 dB at 10 kHz-100 MHz.

G. Short Circuit Current Rating: 200 KAIC.

H. Indication system:
   1. A green/red LED indicator for each phase.
   2. Flashing trouble light.
   3. Shall alarm open circuit damage, thermal conditions and overcurrent.

I. Transient surge counter.
   a. Provide dry contact for remote monitoring.

J. Integrated model.

K. Manufacturers:
   1. Square D
   2. Eaton Corporation.
   3. L.E.A./Dynatech.
   4. Vertiv
   5. Current Technology.

## 2.07 SHORT CIRCUIT PROTECTION, COORDINATION AND ARC FLASH STUDY

A. The contractor shall provide an electrical power systems study as described below and submitted for approval prior to final equipment submission. Submit documents/drawings of complete short circuit, coordination and arc flash study for the electric distribution system for this project including the service entrance to all branch circuit panelboards and branch circuits 50A and over. Documents shall be prepared by a licensed Professional Engineer in New York State with at least 5 years' experience in similar studies, using the most current software

version of SKM Power Tools or Easy Power. Study documentation shall include:

1. Software used to prepare study with a description of the software philosophy.
2. Quantities, ratings and characteristics of all system components.
3. Impedance data for each piece of equipment.
4. Calculation methods and tabulations.
5. One-line diagrams and impedance diagrams.
6. Service entrance characteristics (available short circuit, X/R ratio, voltage, etc).
7. Available short circuit at each node in the system with associated required equipment ratings.
8. Coordination verification with equipment settings and time current graphs.
9. Arc flash energy level at each piece of equipment with adhesive labels.
10. Conclusions and recommendations.

B. Short Circuit Current:
   1. Perform short circuit current calculations to determine the available short circuit current at each piece of distribution equipment.
   2. Calculations shall take into account the following:
      a. Available utility short circuit current.
      b. System impedances (transformers, conductors, etc.).
      c. Conduit types.
      d. Motor contribution for motors.

C. Coordination:
   1. Electrical distribution system shall be fully coordinated from the service entrance to branch circuit over current protection.
   2. Emergency electric distribution system shall be fully coordinated from the service entrance to the branch circuit over current protection.
   3. The coordination shall meet the current edition of ANSI/IEEE Standard 242 - Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems. The study shall indicate that this standard was used as the basis for the study.
   4. Field settings, adjustments and minor modifications necessary for conformance with the recommendations shall be accomplished without additional expense to Owner. Provide documentation that all applicable over current protective devices have the recommended settings and have been suitably calibrated.
   5. Coordination graphs shall indicate coordination proposed for systems indicated on log-log graph forms. Coordination graphs shall include:
      a. Complete descriptive titles.
      b. Graph for all over current devices.
      c. Thermal damage curves (conductors, transformers, etc.), available short circuit current limits, rated current levels and over current protective device operation bands. Over current protective device operation bands shall be for the recommended settings.
      d. Indication that applicable devices are inherently selectively coordinated with associated back up list from the manufacturer.
      e. Listing of all project over current devices with manufacturer and model number.
      f. Recommended settings for all adjustable over current protective devices.
   6. Equipment design discrepancies and proposed corrective modifications if required shall be submitted with studies with variations clearly note.

D. Arc Flash:
   1. Arc flash evaluation shall be provided to determine the arc flash energy at each piece of distribution equipment. Calculation shall be in accordance with IEEE 1584 and NFPA 70E.
   2. Two separate arc flash energy levels shall be calculated and displayed on separate labels in locations that an arc flash energy reduction maintenance switch is utilized to indicate

the energy with and without the switch engaged.

3. Arc flash calculations shall utilize finalized and approved over current protective device settings.
4. Arc Flash labels shall be furnished and installed on the appropriate equipment after the Short Circuit, Coordination and Arc Flash Study has been completed and approved. Layout and information on the label shall be approved by the engineer of record.

E. Once competed and approved, provide the Owner and Engineer an electronic copy of the full calculations, inputs and outputs.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Receive, inspect, handle, store, and install equipment as per NEMA published bulletins.

B. Visually inspect physical and mechanical conditions, anchorage, alignment, and grounding. Verify the equipment is clean and perform specific inspections and tests recommended by the manufacturer.

C. Secure covers to enclosures and tighten all bolts to manufacturer recommended torques to reduce noise generation. Remove shipping bolts, blocking and wedges.

D. Construct concrete bases and anchor floor mounted equipment according to manufacturer's written instructions. Concrete base shall be 4 inch nominal thickness and extend 3 inches on all sides, with 6" x 6", #6 reinforcing wire mesh centered and doweled into floor. Coordinate size and location of concrete bases with actual equipment provided. Cast anchor bolts inserts into bases. Concrete, reinforcement, and framework requirements are specified with concrete. Locate base to provide adequate clearances for proper ventilation.

E. Tighten electrical connectors and terminals according to manufacturer's published torque tightening values.

F. Ground equipment per the NEC and Section 260526.

G. Panelboards:
   1. Mount top of trim 90 inches above finished floor unless otherwise noted. In ADA accessible locations, mount top of trim 48 inches above finished floor.
   2. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box. Securely mount to the building structure (not wall surface material, finishes, etc.) utilizing 3/8" minimum bolts/washers/nuts with quantity suitable for the building structure and in accordance with the manufacturer's recommendations. Distribution panelboards if not mounted to a concrete wall shall additionally have a galvanized steel channel base to support it from the floor with horizontal members around the perimeter and vertical a minimum of 18" on center.
   3. Install overcurrent protective devices, surge protection devices, and instrumentation. Set field-adjustable switches and circuit breaker trip settings.
   4. Install filler plates in unused spaces.
   5. For recessed panelboards, stub four (4) 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four (1) 1-inch empty conduits into raised floor space or below slab to floor below not on grade.
   6. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
   7. Provide insulated protective cover over threaded bolts/studs within the panelboard.
   8. Provide lugs/terminations suitable for the indicated conductor size. Where conductors have been oversized for voltage drop and where approved by the Engineer it shall be allowed to reduce the conductor size using hydraulically crimped splice in a box next to the distribution equipment to allow for standard lug termination.

H. Molded Case Circuit Breakers:
   1. Visually inspect that equipment nameplate data are as described in the specifications and shown on the drawings. Inspect physical and mechanical condition, and anchorage,

alignment, grounding, and clearances.

2. Verify that the unit is clean and operate the breaker to ensure smooth operation. Inspect bolted connections for high resistance using a low resistance ohmmeter or by calibrated torque-wrench method in accordance with manufacturer's published data.
3. Inspect operating mechanism, contacts, and chutes in unsealed units.
4. Provide pad lockable branch circuit breaker device to hold circuit breaker in the closed position, but not prevent overcurrent protection, for all branch circuits serving fire alarm controls panels, emergency lighting and life safety branch circuits.

I. Disconnect (Safety) Switches:
   1. Provide wiring, conduit and connections between ASD and disconnect auxiliary switch to ASD.

J. Fuses:
   1. Examine fuses before installation. Reject fuses that are moisture or physically damaged. Examine holders to received fuses for compliance with installation tolerances and other conditions affecting performance. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment. Arrange fuses so rating information is readable without removing fuse.

K. Surge Protection Devices:
   1. Provide overcurrent protection device and disconnect for installation of SPD in accordance with UL 1449 and manufacturer's written instructions.
   2. Install leads between disconnects and SPDs short, straight, twisted, and in accordance with manufacturer's written instructions. Do not splice or extend leads and do not bond neutral and ground. Use crimped connectors and splices only - wire nuts are not acceptable.

**3.02 FIELD QUALITY CONTROL**

A. Switchboards and Panelboards:
   1. Test insulation resistance for each bus, component, connecting supply, feeder, and control circuit. Test continuity of each circuit.
   2. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.
   3. Correct multifunctioning units on site where possible, and retest to demonstrate compliance; otherwise replace with new units and retest.
   4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

B. Molded Case Circuit Breakers (Electronic Trip):
   1. Breakers shall be tested with secondary current injection utilizing a minimum of three (3) different points on each of the phase and one for ground fault overcurrent curves. Phase test points shall be at instantaneous, short time and long time portions of the curve.
      a. The tested points shall be plotted on the TCC curves utilizing the final settings with the coordination study. Each breaker shall be tested to prove proper operation at the specific settings.

C. Surge Protection Devices:
   1. Do not perform insulation resistance tests of the distribution equipment wiring equipment with SPDs installed. Disconnect SPDs before conducting insulation resistance tests; reconnect them immediately after testing is over. Energize SPDs after power system has been energized, stabilized, and tested.

**3.03 IDENTIFICATION**

A. Identify all items of equipment as described in Section 260501. Identification shall be provided for panelboards, motor starters, disconnect switches, enclosed circuit breakers, surge suppression devices, control panels, etc.

B. Panelboards shall have a label indicating name/tag ID, feeder source, conductor color convention and for service entrance locations the available short circuit current.

C. Provide a permanent label on service equipment containing the following information:
   1. Nominal system voltage.
   2. Available fault current at the service overcurrent protective device.
   3. The clearing time of service overcurrent protective device based on the available fault current at the service equipment.
   4. The date the label was applied.

**3.04 ELECTRICAL LOAD TEST**

A. Conduct a load test prior to request for final payment and comply with the following:
   1. Energize maximum normal light and power load for a period of two hours when scheduled.
   2. Record voltage at service and at each panel.
   3. Measure current in each phase of all feeders.
   4. Adjust transformer taps as directed by engineer after review of report.
   5. Provide and install all necessary metering equipment.
   6. Owner's Representative or Site Representative shall witness the test.
   7. Before final acceptance specified test shall be completed to the satisfaction of the Owner's Representative who shall be sole judge of the acceptability of such tests and who may direct the performance of such additional tests as deemed necessary in order to determine the acceptability of the systems, equipment, material and workmanship.
      a. Additional tests required by the Owner's Representative shall be provided at no additional cost. Protective equipment shall be actuated in a manner that clearly demonstrated their workability and operation.

**3.05 CLEANING**

A. At the completion of the project, while equipment is de-energized, it shall be thoroughly cleaned to a shipped condition using methods in accordance with the manufacturer's recommendations. Utilize vacuum for cleaning and not compressed gas.

**3.06 SPARE PARTS**

A. Deliver loose equipment to the Owner and obtain receipt for fuses, keys to panelboards, etc.

**END OF SECTION 26 20 00**

## SECTION 26 27 13
## ELECTRIC SERVICE

### PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.02 DESCRIPTION

A. Provide labor, materials, equipment and services for the complete installation of an electric service and related Work required in these Contract Documents. The Utility Company is Central Hudson Gas and Electric.

### 1.03 UTILITY COMPANY

A. Include all utility company fees and charges for service as part of contract.

### 1.04 QUALITY ASSURANCE

A. All methods of construction, details of workmanship, that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc., correspond to the nomenclature dictated by those manufacturers. All equipment shall be tested at the factory. Standard factory inspection and operational tests will be acceptable.

B. Installation shall be accordance with utility requirements NFPA 70 (National Electrical Code), National Electrical Safety Code (NESC), state codes, local codes, and requirements of authority having jurisdiction.

C. Equipment shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of applicable published ANSI, NEMA and IEEE Standards.

### 1.05 SUBMITTALS

A. All items of equipment and accessories including the following:
   1. Underground ductbank materials.
   2. Billing Instrument transformer enclosure.

B. Send three copies of submittals to the Utility Company for review before sending submittals to Engineers. Include one (1) Utility Company approved copy with submittal drawings for review.

### 1.06 SERVICE CHARACTERISTICS

A. Secondary Service:
   1. Low Voltage: 208/120 grounded, wye, three phase, four wire, 60 Hz.
   2. Source:
      a. Utility Company pole mount transformer, for underground service.

### 1.07 UTILIZATION VOLTAGES

A. Building power system shall be a nominal 208/120volt, three phase, four wire, solidly grounded, 60 Hz system.

### 1.08 UTILITY COMPANY COORDINATION

A. Coordinate entire electric service with Utility Company.

B. Do not interrupt electric system until approved in writing, coordinated so outages occur at Project Site convenience.

C. Coordinate switching requirements with utility company, as approved in writing by the Owner.

## PART 2 - PRODUCTS

### 2.01 UNDERGROUND SERVICE DUCTBANK

A. Refer to Section 260501.

### 2.02 UTILITY COMPANY METERING ACCOMMODATION

A. Verify all requirements with Utility Company before proceeding.

B. Utility Company shall furnish all billing instrument CT and PT transformers.

C. Provide code gauge metal cabinet, as approved by Utility Company, to house billing instrument transformers.

D. Provide Meter Backboard:
   1. Use 3/4 in. x 5 ply marine grade plywood.
   2. Paint front and back of plywood with two (2) coats of exterior gray paint.
   3. Size as required by utility company.

## PART 3 - EXECUTION

### 3.01 UTILITY COMPANY METERING ACCOMMODATION

A. Verify all installation requirements with utility company before proceeding.

B. Install meter backboard. Space board from wall when located on outside wall. Provide required clearances.

C. Mount CT cabinet where called for and as directed by the Utility Company.

D. Install instrument current and potential transformers in cabinet.

E. Provide 1-1/2 in. rigid galvanized steel conduit from the instrument transformer location to the meter backboard.

F. Install all test devices furnished by the Utility Company.

G. Utility Company shall provide all Utility Company metering instruments. Install all meter sockets as required.

H. Provide wiring from meter instrument to metering transformers as directed by Utility Company.

I. Provide grounding, connections and miscellaneous materials required.

### 3.02 INSTALLATION AT RISER POLE

A. Terminate at existing riser pole.

B. Stub conduit at position directed by Utility Company.

C. Provide hot dipped galvanized steel rigid conduit at riser.

D. Stub active conduit to height directed by Utility Company and cap.

E. Stub spare conduit 1 ft. above grade and cap waterproof with threaded cap.

F. Strap conduit to pole every 4 ft.

G. Place service lateral cable with cable length sufficient to extend 3 ft. above utility company secondary rack. Tape end of cable. Utility Company will form drip leg and make connections to lateral.

H. Ground as directed by Utility Company.

**END OF SECTION 26 27 13**

## SECTION 26 32 13
## POWER GENERATION - GENERATOR, AUTOMATIC TRANSFER SWITCH AND ACCESSORIES

### PART 1 - GENERAL

### 1.01 WORK INCLUDED

A. Provide labor, materials, equipment and services for the complete installation of emergency generator system, automatic transfer switch and related work required in these Contract Documents.

### 1.02 REFERENCE STANDARDS

A. ANSI C12.20 - American National Standard for Electricity Meters - 0.1, 0.2, and 0.5 Accuracy Classes; 2022.

B. NFPA 37 - Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines; 2024, with Amendment.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 110 - Standard for Emergency and Standby Power Systems; 2025.

E. UL 1008 - Transfer Switch Equipment; Current Edition, Including All Revisions.

F. UL 2200 - Stationary Engine Generator Assemblies; Current Edition, Including All Revisions.

### 1.03 QUALITY ASSURANCE

A. All methods of construction, details of workmanship that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc. correspond to the nomenclature dictated by those manufacturers. All equipment shall be tested at the factory. Unless specified elsewhere, standard factory inspection and operational tests will be acceptable.

B. Installation shall be accordance with NFPA 37 (Installation and Use of Stationary Combustible Engines), NFPA 70 (National Electrical Code), NFPA 110 (Standard for Emergency and Standby Power Systems), National Electrical Safety Code (NESC), state codes, local codes, and requirements of authority having jurisdiction.

C. Equipment shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of applicable published ANSI, NEMA, UL and IEEE Standards. If skintight enclosure is used, the equipment shall be listed for UL 2200.

D. System emissions shall meet or exceed the EPA and Code of Federal Regulations 40CFR.

### 1.04 SUBMITTALS

A. Submit shop drawings only for manufacturers named. Submission of other manufacturers will be rejected unless the terms of equivalents and substitutions stated in the General Provisions are followed.

B. Submit shop drawings on equipment and accessories to include the following:
   1. Engine-generator set, including engine, alternator, circuit protection, fuel consumption, exhaust flow/temperature, noise (dBA), performance ratings (kW, starting kVA, pf, voltage, etc.), thermal ratings, heat generation.
   2. Engine controls, including starting controls, governor, etc.
   3. Generator instrumentation, voltage regulator, insulation class, etc.
   4. Catalog cuts, bill of materials, descriptive data, spare parts list for specified equipment.
   5. Mounting arrangement, floor plans, elevations, overall dimensions including accessories, foundation, bedrail, and/or bolts, power and control conduit entrance space.

6. Weatherproof enclosure: dimensions, elevation, plan, attenuation, cooling, accessories, etc.
7. Batteries, mounting rack, accessories.
8. Gas regulator.
9. Automatic transfer switch and accessories.
10. Remote annunciator panel.
11. Wiring diagrams of all equipment, external and internal connections and interconnections.
12. Emergency shutdown switch.
13. Factory tests and field supervision reports as called for.

C. Composite Instruction Books shall include as a minimum the following:
1. Instructions covering overall equipment.
2. Instructions covering all major and serviceable components, and accessories.
3. Recommended spare parts with current prices.
4. Complete renewal parts information.
5. Quantities of oil/coolant/etc.
6. Instructions, both individually and collectively, shall adequately describe receipt, handling, care, inspection, installation, operation, and maintenance of equipment.
7. Instruction books shall be used for equipment installation, and submitted prior to project closeout.
8. Factory trained maintenance provider contact information.
9. System error code (alarms, faults, etc.) list with descriptions.

**1.05 STANDARDS AND TESTS**

A. Equipment covered by these specifications shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of all applicable published ANSI, NEMA, and IEEE Standards, the requirements of NEC, NFPA 37, NFPA 110, UL 1008 and UL 2200 Standards. State and local requirements.

B. Furnish submittals of field test reports covering field tests and inspections performed and conducted by manufacturer's representative.

**1.06 FIELD SUPERVISION**

A. Submittal shall state that adequate local (within 75 mile (120.7 kilometer) radius of project locations) field supervision and service, by competent qualified representative of the manufacturer, who is regularly engaged in working on this type of equipment, will be available at any time.

B. Submittal shall state address of nearest vendor's place of business, telephone number and name of person to contact for field service.

C. Provide field supervision/service at no additional cost to cover inspection, test, and start-up of this equipment.

D. Submittal shall state the amount of field supervision/service recommended by vendor to cover critical points of installation, inspection, test, and start-up.

E. Provide proposal for a yearly maintenance agreement for time beyond the warranty period.

F. The above data shall be included with submittals.

**1.07 RIGGING**

A. Provide rigging to unload, move, transport, set in place, erect, etc.

**1.08 WARRANTY**

A. Provide a warranty for the specified equipment to be free from defects in materials and workmanship, whether functional or nonfunctional, replace or repair without cost, defects which, with normal usage, appear within one (1) year of project closeout.

## 1.09 TRAINING

A. Provide verbal and written training to facility appointed personnel in the proper and safe manner of operating equipment.

B. Training shall be at a time convenient for the Owner, not during system start up/testing and be a minimum of 4 hours or as needed for the Owner personnel to understand the system operation and maintenance.

## 1.10 DESCRIPTION OF SYSTEM OPERATION

A. Provide Engine-Generator System to meet the following functions:
   1. Arrange system for automatic starting upon failure of normal source voltage.
   2. Provide programmable one-second time delay, field adjustable from 0 to 9999 seconds. Delay time between normal source failure and engine starting.
   3. Initiate engine starting cycle from transfer switch auxiliary dry contact.
   4. Transfer loads from normal source power to emergency source when engine-generator reaches 90% of its rated voltage.
   5. Retransfer emergency loads from emergency generator to normal source ten (10) minutes after normal source has reached 90% or more of normal voltage. Control shall be field programmable from 0 to 9999 seconds.
   6. Retransfer emergency loads from emergency generator to normal source instantaneously when normal source has reached 90% or more of normal voltage, if emergency generator has failed while supplying load.
   7. Run engine for a period of ten (10) minutes after retransfer of emergency loads to normal source. Engine-generator will then shut down, automatically resetting and leaving all controls ready for the next emergency start condition. Period shall be programmable from 0 to 9999 seconds.
   8. Use integral automatic transfer switch time clock to automatically exercise engine once each every four weeks for 0.5 hours. Time clock contacts shall simulate loss of normal voltage; start engine, and shut engine down after fifteen minutes of operation. The load shall not transfer to the emergency source during the exercise time. Provide a selector switch to permit cycling engine-generator under load or no-load conditions.
   9. Shall shutdown upon activation of remote emergency shutdown button.

# PART 2 - PRODUCTS

## 2.01 ENGINE-GENERATOR SET

A. General: The system shall meet the following parameters.
   1. 208Y/120 volts, 12 lead, three phase, four wire, connected, 60 Hz.
   2. 175 kW stand-by rating at 0.8 power factor. Upsized 200kW alternator.
   3. Minimum motor starting kVA rating shall be 361, based on 30% instantaneous voltage dip.
   4. Suitable for ambient conditions:
      a. Ambient Temperature: -25C to 40°C.
      b. Altitude: 380ft above sea level.
   5. Maximum of 154.4 inch (3921.76 mm). L x 54 inch (1371.6 mm). W x 93.3 inch (2369.82 mm). H (with silencer).
   6. 7-11 inch (279.4 mm). WC of utility natural gas pressure.
   7. Maximum allowable combustion exhaust back pressure of 0.75 inch (19.05 mm). Hg.
   8. Combustion exhaust temperature shall not exceed 1350°F and 1270 CFM.
   9. System fuel consumption shall not exceed 2400 CFH.

B. Engine - Gaseous Fuel:
   1. Single fuel carburetion for natural gas.
   2. Minimum six cylinder, four stroke cycle, 1800 rpm.
   3. Stand-by rating shall be adequate to provide maximum kW output of generator under full load and motor starting kVA requirements. The engine generator set shall be capable of picking up 100% of nameplate kW, after adjusting for site conditions (altitude,

temperature), in one step with the engine generator set at operating temperature, in accordance with NFPA 110. A resistive load bank (1.0 pf) shall be acceptable for meeting the load requirements.

4. To include carburetor, secondary gas regulator (sized for 1.5 full load flow), electric solenoid shutoff valve, strainer (fuel filter), gas shutoff cock.
5. Provide primary gas regulator if required by characteristics of local utility gas supply.
6. Full pressure lubrication system with positive displacement, mechanical, full pressure gear type oil pump, full flow oil filters with replaceable filter element, equipped with spring-loaded bypass valve as an insurance against stoppage of lubricating oil in the event filter becomes clogged; water-cooled oil cooler and thermostat.
7. One or more oil or dry type air cleaners of sufficient capacity to protect engine working parts from dust and dirt.
8. Water cooled with unit mounted, closed loop type radiator, belt-driven pusher fan, centrifugal water circulating pump, thermostat temperature control, liquid-cooled exhaust manifolds suitable for unit full load operation and 50°C ambient condition. Provide radiator with duct connection flange. Rotating parts shall be protected against accidental contact. Low coolant level sensor alarm and shutdown.
9. Provide 50/50 solution of propylene glycol for engine closed loop cooling system.
10. Provide thermostatically controlled water jacket heater suitable for the intended location and wiring, rated for 120 volt, single phase operation. Unit shall be sized to maintain unit temperature for optimum starting conditions. Provide circuit for this from a normal power source.
11. Electronic governor shall provide automatic engine-generator set frequency regulation adjustable from isochronous 0% droop. Governors using external throttle linkages are not acceptable.
12. Battery starting system per manufacturer's recommendations. Voltage shall be suitable for the needed starting capability, batteries and voltage drop.
13. Engine mounted battery charging alternator (belt driven), 35 ampere minimum, and solid-state voltage regulator. Higher charging current unit shall be provided as recommended by the manufacturer. Battery charging time shall not exceed24 hour for a full recharge.
14. An electric starter capable of three complete cranking cycles without overheating, before overcrank shutdown. Shall comply with NFPA 110.

C. Generator/Alternator:
   1. Synchronous, four pole, compatible with unit rpm, revolving field, fireproof construction. Brushless, permanent magnet exciter with solid state voltage regulator.
   2. Insulation rating of alternator shall, at a minimum, meet requirements of NEMA Class H construction to comply with NEMA standard MG1-22.40 and 16.40. Temperature rise of rotor and stator shall be limited to Class F (155°C or 105°C maximum temperature rise of winding, measured by resistance method, at 40°C ambient) for standby rating.
   3. Insulation rating of alternator shall, at a minimum, meet requirements of NEMA Class H 180°C construction to comply with NEMA standard MG1. Temperature rise of rotor and stator shall be limited to 150°C maximum temperature rise of winding, measured by resistance method, at 40°C ambient) for standby rating.
   4. Voltage regulation within 1% plus or minus of rated voltage for any constant load from no load to full load.
   5. Frequency regulation shall be isosynchronous from steady state no load to steady state rated load. Speed variations for constant loads from no load to rated load shall not exceed ±0.25% of rated speed, with constant ambient and operating temperature.
   6. Provide plus or minus 5% voltage adjustment.
   7. Total harmonic distortion (THD) shall not exceed 5% of rated voltage and no single harmonic shall exceed 3% of rated voltage.
   8. Telephone influence Factor; TIF shall be less than 50 per NEMA MG1-22-43.
   9. Terminal voltage re-established to within 2% of rated voltage within four seconds following any sudden change in load between no load and full load or between full load and no load.

10. Sealed, permanently lubricated ball bearings.
11. Direct or beltdriven generator cooling blower.
12. Provide fixed field connections to AC output leads in extra large terminal box with removable cover.
13. Provide adequate wiring space for conduits. Power cables shall exit the bottom of the generator.
14. Exciter shall be brushless, permanent magnet type.

D. Generator Auxiliary Equipment:
1. Provide generator output circuit breaker(s) as indicated, three pole, common trip, shunt trip, thermal magnetic type, to completely protect the generator from overloads; frame size and trip rating as called for. Provide solid state trip unit and 100% rating for circuit breakers 250A and above with long time, short time and instantaneous adjustable settings.
2. Outdoor weather-protective housing with exhaust muffler installed and located within the housing. The housing shall have hinged access doors for all maintenance and control locations. All doors shall be lockable. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer's standard color. All hardware (hinges, screws, bolts, door operator, etc.) to be stainless steel. Input and output air dampers with controlled damper motorized actuators shall be spring open and held closed when not in use. Unit sound attenuation shall limit the noise level to 75 dB at 23 feet (701.04 cm) Provide concrete pad as detail on the drawings. Generator unit shall be UL 2200 labeled with enclosure installed.
3. Battery Heater: Provide pad type battery heater suitable for intended location. Provide circuit for this from a normal power source.

E. Acceptable Manufactures:
1. Generac (Design Make)
2. Caterpillar
3. Cummins, Inc.
4. MTU/Detroit Diesel
5. Kohler

**2.02 MICROPROCESSOR ENGINE-GENERATOR SET CONTROL**

A. The control shall have automatic remote start capability. Starting cycle shall be initiated by auxiliary contact in automatic transfer switch. A panel mounted switch shall stop the engine in the STOP position, start and run the engine in the RUN position, and allow the engine to start and run by closing a remote contact, and stop by opening the remote contact when in the REMOTE or AUTOMATIC position.

B. Automatic start circuit shall be supervised at the generator. Upon short, ground or other malfunction of the start circuit a trouble condition shall indicate at the generator controller and remote annunciator and the generator shall automatically start.

C. The control shall include a cycle cranking function. The cranking cycle, nonadjustable, shall consist of an automatic crank period of approximately 15 seconds duration followed by a rest period or approximately 15 seconds duration. Cranking shall cease upon engine starting and running.
1. Two (2) means of cranking termination shall be provided, one as a backup to the other. Failure to start after three cranking cycles (75 seconds) shall shutdown and lockout the engine, and visually indicate an overcrank shutdown on the panel.

D. The control shall shut down and lock out the engine upon: failing to start after the specified time (over crank), overspeed, low lubricating oil pressure, high engine temperature, or operation of a remote manual stop station. Provide audible alarm and visual indication of the particular contact that operated, and reset pushbutton. Provide common fault contacts, wired to terminal board for remote alarm indication.

E. The generator control system shall be a fully integrated microprocessor based control system for standby emergency engine generators meeting all requirements of NFPA 110 level 1.

F. The generator control system shall enable remote diagnostics and building management integration of all generator functions. The generator controller shall provide integrated and digital control over all generator functions including: engine protection, alternator protection, speed governing, voltage regulation and all related generator operations.

G. Communications shall be supported with building automation through Modbus, Ethernet or Building Management System protocol without network cards.

H. Circuit boards shall be sealed/encapsulated and potted where beneficial for vibration and moisture.

I. Diagnostic capabilities should include time-stamped event and alarm logs, ability to capture selectable operational parameters during events, simultaneous monitoring of all input or output parameters, and 0.2 msec data logging capabilities.

J. In addition to standard NFPA 110 alarms, the application loads should also be protected through instantaneous and steady state protective settings on system voltage, frequency, and power levels.

K. The control system shall provide pre-wired a minimum of six owner customizable digital outputs and communications support with RS232, RS485, or an optional modem.

L. System inputs/outputs shall be software configurable providing full access to all alarm, event, data logging, and shutdown functionality.

M. The control panel shall be a NEMA 12 enclosure and include a digital display for all user pertinent unit parameters including: engine and alternator operating conditions; oil pressure and optional oil temperature; coolant temperature and level alarm; fuel level (where applicable); engine speed; DC battery voltage; run time hours; generator voltages, amps, frequency, kilowatts, and power factor; alarm status and current alarm(s) condition per NFPA 110 level 1.

N. Upon overload of generator capabilities, controller shall protect the alternator by shutting down the generator and shunt trip the circuit breakers.

O. The control shall engine monitor indicator LEDs on the control panel; one red light for each of the five shut downs (except the remote manual stop), and one yellow light each for the high engine temperature and low engine oil pressure prealarms, and one green run light. The control panel monitor shall include; a flashing red light to indicate the generator set is not in automatic start mode, a yellow light to indicate low coolant temperature, a yellow light to indicate low fuel, a red light to indicated battery charger failure, and one red light for auxiliary use (for a total of twelve). A panel mounted switch shall reset the engine monitor and test the lamps. The engine-generator set starting battery(ies) shall power the monitor. Operation of shut down circuits shall be independent of indication and prealarm circuits. Provide a low coolant level shutdown, which shall be indicated as a high engine temperature fault.

P. Provide remote annunciator in Room indicated for engine-generator alarm function. Alarm functions for generator shall comply with NFPA 110 and as a minimum are as follows:
   1. Visual signals for: Battery charger AC supply failure, battery charger DC output failure, engine-generator running.
   2. Visual and audible signals for: Overspeed, low lube oil pressure, high and low water temperature, overcranking (failure to start), overload, over speed, on temporary power, low fuel, low coolant level, generator supplying load, low battery voltage and charger failure.
   3. Provide all of the indications and audible alarms called for above. Provide alarm silence and lamp test switches.

**2.03 BATTERIES**

A. Provide batteries as follows:

1. Sealed lead acid type, quantity and connections as recommended by the generator set manufacturer.
2. Provide corrosion-resistant battery mounting rack, battery interconnecting cables and terminals, etc.
3. Provide battery heating pad suitable for the intended location, 120 VAC and power connection to maintain 10 second starting time.

**2.04 AUTOMATIC TRANSFER SWITCH (ATS)**

A. Description:
1. The automatic transfer switch shall consist of a power transfer switch and a microprocessor based control module, interconnected to provide complete automatic operation. Double throw, mechanically and electrically interlocked. All main contacts shall be of silver composition. The operating transfer time shall be a maximum of 1/2 of a second.
   a. Transfer switch shall be capable of manual transfer in order to meet the requirements of UL 1008 and UL listing requirements as described UL's "Electrical Construction Materials.". Circuit breakers shall not be used as a switching means.
2. Operated by momentary energization of a single coil with mechanical latching in both normal and emergency positions.
3. Operating voltage for transfer obtained from source to which load is to be transferred.
4. Three phase, four wire, three pole, solid neutral 208/120 volt normal and emergency power source contacts.
5. Ampere rating as called for, rated for continuous duty.
6. Unit shall be service entrance rated with a main circuit breaker.
7. Provide magnetic blowout coils and arc barriers on each pole.
8. Provide voltage supervisory relays on each phase of both normal and emergency sources, such that transfer and engine start is affected should any one phase of the three phase supply be below 80% of normal voltage.
9. Three-cycle closing and withstand rating minimum 35,000A rms symmetrical amperes without the use of current limiting fuses.
10. Manufacturer's standard mechanical type lugs suitable for aluminum or copper conductors. Provide lugs for each power cable, phase and neutral. Cable size and conductor type as called for. Terminals front connected.
11. Provide pilot lights (LED's) as follows:
    a. Green, indicating normal switch position.
    b. Red, indicating emergency switch position.
    c. Fuse for each light.
12. Provide the following accessory features:
    a. Adjustable time delay before engine starting, field programmable from 0-9999 seconds. Factory set at 1s.
    b. Adjustable time delay on transfer to emergency, field programmable from 0-9999 seconds. Factory set at 3s.
    c. Adjustable time delay on retransfer to normal field programmable from 0-9999 seconds, factory set at 300 seconds.
    d. After retransfer to normal, the engine generator set shall be allowed to run, unloaded, for an additional 0-9999 seconds, factory set to 300 seconds.
    e. Test switch, engine start and transfer.
    f. Pushbutton to bypass time delay on retransfer back to "normal" position.
    g. Engine start contact.
    h. Time clock exerciser with transfer. Retransfer shall be automatic at end of exercise period. Provide a bypass switch for manual exercise and a selector switch to permit cycling engine-generator under load or no-load conditions.
    i. Auxiliary contacts to indicate normal, emergency and neutral position, two form C for each position. No common wires for auxiliary contacts. Bring wires to terminal block,

suitably labeled.

j. A contact which closes when normal source fails for initiating engine starting, rated min, 10A @ 32 VDC.
k. A contact which closes when unit is on emergency power and normal power returns and is suitable for use. Contact shall be wired to elevator controller.
l. Provide ground studs to enclosure for mechanical lugs for size #4/0 copper cables.
m. Provide any other accessories as may be required to achieve operation as described in Article 1.9.
n. Provide minimum of 12 of spare fuses.
o. Provide NEMA 1 sheet metal enclosure for all mounting, front door hinged.
p. All time delay relays shall be field programmable and shall show the actual setting time in minutes or seconds.

B. Acceptable Manufacturers:
1. ASCO.

**2.05 AUTOMATIC TRANSFER/BY-PASS ISOLATION SWITCHES**

A. The Automatic Transfer/By-Pass Isolation Switches shall comply with the following, in addition to all provisions of the Automatic Transfer Switch Specification:
1. Furnish and install automatic transfer and bypass- solution switch system with number of poles, amperage, voltage and withstand ratings as shown on the plans.
a. Each system shall be the product of one manufacturer and shall consist of two (2) elements; an automatic transfer switch and a two-way bypass-isolation switch. The system shall be listed to the latest requirements of Underwriters Laboratories Standard UL 1008 and rated for Total System Load.

B. An externally operable, two-way bypass-isolation switch shall provide manual bypass of the load to either source and permit isolation of the automatic transfer switch from all source and load power conductors. Bypass and isolation shall be accomplished without the necessity of opening enclosure doors, thus exposing the operator to live components. All main contacts shall be manually driven. Arrangements utilizing electrically driven contacts are prohibited.

C. The permanently affixed, external, bypass handle shall provide three operating modes: "Bypass to Normal," "Automatic" and "Bypass to Emergency." Bypass to the load carrying source shall be affected without any interruption of power to the load (make before break contacts). The operating speed of the bypass contacts shall be the same as that of the associated automatic transfer switch and shall be independent of the speed at which the manual bypass handle is operated. In the "Automatic" mode, the bypass contacts shall be out of the power circuit so that they will not be required to carry fault currents to which the system might be subjected.

D. The permanently affixed, external, isolation handle shall provide three (3) operation modes: "Closed," "Test," and "Open." The "Test" mode shall permit testing of the entire emergency power systems and automatic transfer switch without any interruption of power to the load. The "Open" mode shall completely isolate the automatic transfer switch from all source and load power conductors. When in the "Open" mode it shall be possible to withdraw the automatic transfer switch for inspection or maintenance in accordance with code requirements without removal of power conductors. When in the "Test" or "Open" modes the externally operated bypass switch shall function as a manual transfer switch allowing transfer and retransfer of the load between sources without load regenerating voltage feedback to the transfer switches. This transfer/retransfer operation shall comply with UL 1008.

E. The automatic transfer and bypass-isolation switch system shall be supplied in a common enclosure. The complete system shall be factory assembled and tested prior to shipment. Power interconnections shall be silver-plated copper bus bar. The only field installed power connections shall be at the service and load terminals of the bypass-isolation switch. All control interwiring shall be provided with disconnect plugs.

F. Unit shall be front accessible only.

G. The external visual position indicator shall be provided to indicate bypass-isolation switch position. Pilot lights shall indicate availability of power sources and automatic transfer switch position. A prominent and detailed instruction plate shall be furnished.

H. Acceptable Manufacturer:
   1. ASCO

**2.06 POWER METER**

A. For each transfer switch provide a factory installed unit mounted power meter with the following parameters:
   1. LCD or LED display.
   2. Line voltage control power.
   3. Voltage input with overcurrent protection and disconnecting means.
   4. True RMS voltage and current measurement.
   5. Metered parameters: Phase current, line voltage, phase voltage, frequency, power factor per phase and three phase total, real power per phase and total, reactive power per phase and total, apparent power per phase and total, total real energy, total reactive energy, total apparent energy, voltage/current harmonics (% THD), user configured sliding window for real, reactive and apparent power peak demand. Sampling rate shall be 512 sample points per cycle minimum.
   6. Accuracy: Energy, and demand power: 0.2% in accordance with ANSI C12.20. Instrument current transformers shall be factory wired to shorting blocks to prevent open-circuiting the current transformers under energized conditions. The meter shall also be user programmable for current to any CT ratio.
   7. Capable of metering up to 480 volts without external potential transformers. The meter shall also be user programmable for voltage range to any PT ratio.
   8. Communications: Modbus RTU, TC/IP, etc.
   9. Acceptable Manufacturers:
      a. Square D
      b. Eaton
      c. Shark

**2.07 EMERGENCY OFF PUSH BUTTON**

A. System shall have a maintained contact mushroom head push button with lockable protective hinged cover. Unit shall be a two pole double throw unit in a weather proof box/cover. Contacts shall be rated for 20A. Provide circuiting in conduit from the push button to the generator.

B. Push button shall shut down the generator operation until reset.

C. Locate the push button mounted on the exterior of the building for exterior generators and outside the generator room for interior generators.

**PART 3 - EXECUTION**

**3.01 INSTALLATION - GENERAL**

A. General Requirements:
   1. Completely coordinate installation, assure that elements of the system are compatible, operational and correct.
   2. Provide rigging to unload, move, and set/bolt in place engine-generator and ATS. Provide concrete pad as detailed on the drawings.
   3. Provide miscellaneous bolts, washers, nuts, clips, lockwashers, small hardware, etc., of durium or equal rust resistant material, to make installation complete.
   4. Refer to "Grounding" section of specifications.
   5. Install equipment plumb, level, and true.
   6. Leave maximum space available in front, along side, etc., all items of equipment, to allow easy access and servicing of serviceable components. Meet NEC requirements.

7. All floor mounted equipment shall have a 4" equipment pad with wire mesh reinforcement and doweled into the floor unless otherwise indicated.
8. Exterior units shall be a minimum of 5' away from the building or structure.

**3.02 WIRING**

A. Install power and control wiring between engine-generator set, transfer switch, battery charger, louvers, dampers, controls, coolers, batteries, day tank and all other various and related equipment.

B. Comply with Manufacturer's Instruction Books.

C. Color code and identify control and power wires and cables as called for.

D. Provide copper, 600 volt insulation minimum, control wiring; do not splice.

E. Generator start circuit shall be 2 hour rated type CI cable in conduit. This circuit shall be supervised and provide an alarm at the generator controller, remote annunciator panel and all other monitoring locations. Where there are multiple automatic transfer switches the start circuit shall homerun from each individual switch to the generator.

F. Provide "crimp-on" type terminal for control wire terminations, as called for.

G. Provide liquid-tight jacketed flexible conduit for all connections to engine, generator, and to day tank. All connections shall account for the anticipated vibration.

H. Provide green insulated grounding conductor in each conduit run.

**3.03 PHASE IDENTIFICATION AND TESTING**

A. Individual phase conductors shall be color coded as indicated in Section 260501 and the normal and emergency systems shall match.

B. Conductor phase shall be verified prior to applying/installing phase color indication.

C. Prior to operational testing of the system test phase rotation to ensure normal and emergency systems rotate in the same direction. This test shall be performed at each transfer switch. Provide a test report as part of the overall system testing report to indicate the following:
1. Date of test.
2. Personnel performing the testing.
3. For each transfer switch indicate switch designation, phase orientation (A, B, C) and rotation (clockwise, counter clockwise).

**3.04 ENGINE - GENERATOR INSTALLATION**

A. Install where indicated. Refer to drawings for installation detains, pad details, etc.

B. Provide necessary anchor bolts at proper locations, place by templates if required, for proper setting of engine-generator.

C. Manufacturer's Representative shall provide lube oil and anti-freeze for initial start-up. Electrical Contractor shall provide all fuel for start-up and testing and leave tank at the full level upon completion.

D. Entire system shall be complete and operational and shall be test operated, including simulated loss of normal power, all control devices shall be operated to test their function.

E. Determine exact requirements, verify locations, and comply with applicable regulations in installing equipment.

F. Provide an emergency off push button outside the generator room for interior locations or on the unit enclosure for exterior units.

G. Provide "NO SMOKING" sign on each side of the generator room or enclosure to be clearly visible and in accordance with ANSI criteria.

H. Provide the services of the manufacturer's representative to check out the system and instruct the Owner in the operation of the system. Furnish written statement to the Owner's Representative that the checkout and instruction service has been provided. Include statement

that system operates properly, as called for. Submit statement as a submittal for review.

### 3.05 FUEL PIPING

A. Plumbing trade shall provide natural gas piping to engine-generator and make final connection.

B. Provide fuel filter, fuel solenoid valve, secondary regulator, gas shutoff cock, flexible fuel piping and fuel piping diagram.

C. Coordinate fuel piping size with these items.

### 3.06 IDENTIFICATION

A. For installations that have a single grounding location (connected to the main service entrance) provide signage indicating the following: "WARNING - SHOCK HAZARD EXISTS IF GROUNDING ELECTRODE OR BONDING JUMPER IN THE EQUIPMENT IS REMOVED WHILE ALTERNATE SOURCE IS ENERGIZED."

### 3.07 ELECTRICAL LOAD TEST

A. Conduct a resistive load bank test to the full capacity of the generator for four hours after completion of installation, but before connecting to the building system. Record system voltage, current, kW, pf, oil pressure and temperature every 15 minutes with the manufacturer recommended values in the test report. Upon successful completion of load bank test, complete connections to building system and perform an operational test as outlined in "B" below.

B. Conduct a full operational test of complete system prior to request for final payment and comply with the following:
   1. Start the generator by simulating a loss of utility power at each transfer switch.
   2. Energize maximum emergency light and power load for a period of one hour when scheduled.
   3. Record voltage at generator and at each panel, using the same digital meter at each location.
   4. Measure current in each phase of all feeders, using the same digital meter at each location.
   5. Record the time from power loss to engine start and power transfer for each transfer unit.
   6. Reconnect circuits in an effort to provide balanced (within 10%) load on all feeders.
   7. Provide and install all necessary metering equipment.
   8. Owner's Representative shall witness the test.
   9. Provide complete test report with the following as a minimum:
      a. Attendees
      b. Time/date
      c. Initial parameters
      d. Time delay on start.
      e. Cranking time until the generator starts.
      f. Time to reach rated frequency and voltage.
      g. Time for each automatic transfer switch to switch to emergency.
      h. Engine/generator parameters - oil pressure, temperature, voltage, current, kW, power factor, etc. for each 5 minutes.
      i. Automatic transfer switch retransfer time.
      j. Generator shut down time.
      k. Owner sign off.
   10. Before final acceptance, specified tests shall be completed to the satisfaction of the Owner's Representative who shall be sole judge of the acceptability of such test and who may direct the performance of such additional tests as deemed necessary in order to determine the acceptability of the systems, equipment, material and workmanship. Additional tests required by the Owner's Representative shall be provided at no additional cost. Notify Engineer when load bank test is scheduled two (2) weeks prior to actual test.

### 3.08 EQUIPMENT PROTECTION

A. Provide repair or replacement for all damage and defacement, whether functional or nonfunctional, to all equipment from the time it is unloaded, during installation, and during period of beneficial use, and until installation is accepted.

**END OF SECTION 26 32 13**

**SECTION 26 50 00**
**LIGHTING**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2024.

B. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 1598 - Luminaires; Current Edition, Including All Revisions.

E. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

### 1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.03 DESCRIPTION

A. Provide interior and exterior lighting systems, including luminaires, hangers, supports, fittings, wiring, connections and controls, as indicated in the Contract Documents for complete and operational systems. Luminaires, in general, have been specified for the particular type of ceiling in which they are to be installed. Verify the ceiling construction details and provide luminaires suitable for the respective ceiling types and room finish schedule.

### 1.04 REFERENCES

A. The following standards, criteria, codes, etc. shall be followed in the manufacture and installation of the lighting systems.
   1. NFPA
   2. NEC
   3. IESNA
   4. NEMA
   5. ANSI
   6. UL

### 1.05 QUALITY ASSURANCE

A. Luminaires shall be as specified in the "Luminaire Schedule". Luminaire types, appearance, characteristics, photometrics, finishes, etc., correspond to the specified manufacturer and associated series or catalog number listed in the "Luminaire Schedule". Products of other listed acceptable manufacturers shall be equivalent in every way to that of the luminaire specified. The Engineer reserves the right to disapprove any luminaire type submitted which they feel is not equal in quality, appearance or performance to the luminaire specified.

B. Manufacturer's luminaire series or catalog numbers listed in the "Luminaire Schedule" indicate quality, type, and style, but may not cover required special design details. Provide luminaires having such special details as noted in the "Luminaire Schedule", as indicated by the specified luminaire model number and as required for proper installation.

C. All luminaires shall be new and bear a Nationally Recognized Testing Laboratories (NRTL) label for the service intended.

D. Luminaires shall be products of manufacturers regularly engaged in the manufacture of the type of luminaires specified and shall be the manufacturer's latest standard design that complies with specification requirements.

E. Verify the availability of all luminaires proposed to be used in the execution of the work prior to submitting same for approval. The discontinuance of production of any luminaire after such approval has been granted shall not relieve the Contractor from furnishing an approved luminaire of comparable quality and design at no additional cost.

F. Photometric and operational data shall be provided only by qualified and certified organizations. Certification documentation shall be submitted with the luminaire information.

G. Should there be any difference between drawings and schedules, secure from Architect/Engineer such information as necessary prior to providing proposal. When finishes are not definitely specified, they shall be as selected by the Architect and not be limited to standard finishes.

H. Locations indicated for luminaires are approximate. Field coordinate exact locations as near as possible to the location indicated. Coordinate with the Engineer for any major location changes.

**1.06 SUBMITTALS**

A. Product Data: For each luminaire type, include in a single submittal, in order of luminaire designation, the catalog "cut" sheet with complete manufacturer and model number. Product data should include the following:
   1. Manufacturer and Catalog Number.
   2. Features, accessories, materials and finishes.
   3. Physical description and dimensions of luminaires.
   4. Life, power input, output (lumens, distribution, CCT, and CRI) and energy-efficiency data.
   5. Photometric data and adjustment factors based on laboratory tests (space to mounting height ratio, coefficient of utilization complete values, IES distribution, candlepower distribution by angle and luminaire efficiency). Format shall be in accordance with IES TM-27.
   6. Power, signal, and control wiring diagrams between luminaires and controllers.
   7. Lens/Louver Type.
   8. Driver with each type luminaire as applicable (type, sound rating, overload protection, voltage, input/fixture wattage, ballast factor, power factor, etc.).
   9. Integral battery inverters.
   10. Emergency lighting units, including batteries and chargers.
   11. Certification of IES LM-79, IES LM-80 and TM-21 testing for LED luminaires. Luminaires shall be tested in accordance with IES LM and TM standards.
   12. Warranty.

B. Coordination Drawings: Provide coordination drawings in accordance with Section 260500. Reflected ceiling plan(s) 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. Luminaires.
   2. Suspended ceiling components.
   3. Partitions and millwork that penetrate the ceiling or extend to within 12 inches of the plane of the luminaires.
   4. Structure members to which equipment and or luminaires will be attached.
   5. Initial access modules for acoustical tile, including size and locations.
   6. Items penetrating finished ceiling, including other luminaires, air outlets and inlets, speakers, sprinklers, access panels, ceiling mounted projectors, etc.
   7. Coordination of ceiling types and ceiling grids/structure to account for luminaire mounting and space requirements and luminaire lengths.

C. Color Chips: Provide color chips of available finishes for luminaires upon request of Architect/Engineer.

## 1.07 DELIVERY, STORAGE AND HANDLING

A. Luminaires and equipment shall be delivered with NRTL and manufacturer's labels intact and legible. Broken, cracked and damaged materials and equipment shall be removed from the site immediately and be replaced with new materials and equipment. Luminaires and accessories shall be stored in protected dry locations in their original unbroken package or container. Luminaires shall be protected from dust and dampness both before and after installation. Luminaires shall be protected from paint and cleaning solvents during all phases of construction.

# PART 2 - PRODUCTS

## 2.01 LUMINAIRE REQUIREMENTS

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. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division hazard by a NRTL.

C. UL Compliance: Comply with UL 1598 and UL 8750.

D. Recessed Luminaires: Comply with NEMA LE 4.

## 2.02 LIGHT-EMITTING DIODE (LED) LUMINAIRES

A. Luminaires shall be identical in construction features, options and appearance to the luminaries specified in the Luminaire Schedule. LED luminaires include white and RGBW systems as indicated on the luminaire schedule.

B. Luminaires shall be provided with all cables, controllers, power supplies, drivers, connectors, terminators and accessories required for a complete installation. LED system shall utilize pulse width modulation, non-linear scaling techniques and reverse polarity protection.

C. Provide dimming down to 10% as a minimum, or to percentage indicated or called for on the drawings. Unless otherwise indicated, the dimming control shall be a 0-10VDC signal

D. RGBW LED systems where indicated shall be capable of at least 8-bit control of red, green, blue and white module. RGBW LED system shall be capable of setting each module with a unique and individual address. Each address shall be controlled independently by DMX or alternate method protocol. All RGB LED fixtures shall undergo a minimum of eight-hour burn-in testing during manufacturing.

E. LED luminaires shall be high brightness and binned for forward voltage, luminous flux and wavelength.

F. LED luminaires shall be tested in accordance with IESNA LM-79 (luminous output, power input, luminaire efficacy (lumens/watt), color temperature and color rendering index), IESNA LM-80 (L70, output luminous maintenance, 10,000 hour minimum test, calculation method is not acceptable) and IESNA TM-21/28. Luminaire output shall be a minimum of 100 lumens/watt. Rated life shall be a minimum of 50,000 hours at 70% output. Testing shall be performed by a US Department of Energy (DOE) accredited laboratory.

G. Drivers shall be solid state Class 1 power supply/driver with universal input (120-277V). The system shall have a minimum 90% power factor, 3.5 maximum crest factor, minimum efficiency of 90%, a maximum of 20% THD and overload protection. Adequate heat sink capability shall be provided to ensure the rated life. Unit shall meet FCC rules and regulations.

H. Where indicated luminaires shall have color tuning capability and control. System to have separate dimming (5-100%) and color (3000K to 5000K, or as indicated on drawings) adjustability. Control shall be Dali or DMX512 for controllability as indicated. The system shall utilize the most recent settings when energized.

I. The luminaire (to include LED sources and drivers) shall have a full five (5) year minimum warranty for replacement and labor.
   1. Acceptable LED Manufacturers:

a. Philips
b. Osram
c. Cree
d. Nichea
e. Lumiled

J. LED Emergency Drivers:
1. LED emergency drivers shall have the following minimum requirements:
a. Operate indicated fixtures at full illumination for 90 minutes minimum.
b. Universal voltage input (120 to 277V).
c. Upon loss of normal power, fixtures shall automatically switch to battery power.
d. Upon restoration of normal power, fixture shall return to normal mode and charge battery.
e. Battery shall be maintenance free, nickel cadmium type with a minimum life expectancy of seven (7) years.
f. Driver shall be suitable for the environment installed.
g. Driver shall be Class 2 and enclosed entirely in the fixture (except for down lights and exterior locations).
h. Units shall be listed for UL924 -Emergency Lighting and Power Equipment.
i. Minimum five (5) year non-prorated full warranty.
j. Factory installed.
k. Shall include an emergency system test switch integral to fixture.
l. Unit shall be self-testing and provide indication of unit failure.
m. Design Make: Iota, ILB-CP series or approved equal.

**2.03 LUMINAIRE CONSTRUCTION**

A. Metal Parts:
1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during maintenance and when secured in operating position.

C. Lenses:
1. Shall be listed materials tested in accordance with ASTM D-635, "Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position" and burns less than 2/5 inches per minute.
2. The products shall have a smoke density of less than 75 when tested in accordance with ASTM D-2843, standard test method for "Density of Smoke from the Burning or Decomposition of Plastics".
3. The flame spread rating shall not exceed 0-25 and smoke developed rating shall not exceed 450 in accordance with ASTM E-84, standard test method for "Surface Burning Characteristics of Building Materials".
4. Self-ignition shall not occur below 600°F, in accordance with ASTM D-1929, standard test method for "Ignition Properties of Plastics".
5. Materials shall remain in place 15 minutes at 175°F and fall from frame at 200° below ignition temperature in accordance with ASTM D-648, "Deflection Temperature of Plastics Under Flexural Load".

**2.04 LUMINAIRE SCHEDULE**

A. Luminaire schedule is found on the contract drawings.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of Work.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 GENERAL INSTALLATION

A. Comply with NECA NEIS (National Electrical Installation Standard) latest edition.

B. All luminaires shall be installed as per manufacturer furnished installation instructions.

C. Provide for every luminaire as shown on the plans, or as scheduled on the drawings.

D. Location of all ceiling and wall mounted luminaires shall be as indicated on the Architectural and Electrical drawings. The contractor shall verify ceiling type, construction, and material prior to ordering.

E. Provide luminaires with an IC rating for luminaires installed in direct contact with insulation.

F. Provide plaster frames for plaster ceilings and flanged frames for drywall ceilings.

G. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

H. Luminaires shall be suitable and as recommended by the manufacturer for the actual intended mounting method and materials.

I. Supports:
   1. Sized and rated for luminaire weight.
   2. Able to maintain luminaire position after cleaning and maintenance.
   3. Provide support for luminaire without causing deflection of ceiling or wall.
   4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

J. Flush-Mounted Luminaires:
   1. Secured to outlet box.
   2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
   3. Trim ring flush with finished surface.

K. Wall-Mounted Luminaires:
   1. Attached to structural members in walls, to a minimum 20 gauge backing plate attached to wall structural members, or using through bolts and backing plates on either side of wall.
   2. Do not attach luminaires directly to gypsum board.

L. Suspended Luminaires:
   1. Pendant and Rods:
      a. Pendant mount luminaires from 1/4 in. threaded rods of required length.
      b. Brace pendants and rods longer than 48 inches to limit swinging.
   2. Aircraft Cable:
      a. Cables shall be 1/16 in. aircraft cable with end safety fittings. Cable shall be provided with 2 in. diameter mini-canopy and threaded coupler for attachment to a 1/4 in.-20 threaded stud extending 3/4 in. below ceiling.
      b. Cable assembly shall include a spring-loaded adjustment device mounted in the fixture.
      c. The Contractor shall be responsible for providing required supports for cable attachment.
      d. For cord feed to the luminaire provide continuous cord clip of matching color to attach the cord to the cable.

e. Support per manufacturer's recommendations.

3. Support stem mounted, single unit luminaires with approved outlet box and accessories that hold tem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
4. Use tubing or stem for wiring at one point of continuous rows of luminaires and tubing, rod, or wire support for suspension for each unit of length of luminaire chassis, including one at each end.

M. Ceiling-Grid-Mounted Luminaires:
1. Secure to any required outlet box.
2. Use approved devices and support components to connect luminaire to building structure in a minimum of four locations, spaced near corners of luminaire. Utilize #10 steel wire; similar to that used to support the ceiling grid.
3. Provide UL listed seismic hold-down clips and fasten to luminaires and to ceiling grid members at or near each luminaire corner.
4. Install luminaires of sizes less than ceiling grid as indicated on reflected ceiling plans or center in acoustical panel and support luminaire independently with at least two metal channels spanning and secured to ceiling tees.
5. Contractor to verify luminaire mounting and supports are compatible with the ceiling grid type and mounting/support requirements.
6. Contractor to coordinate recessed linear luminaire run lengths with the ceiling grid layout and required mains supports. All continuous run lengths to be verified and coordinated prior to determining the final housing lengths.

**3.03 REMOTE DRIVERS**

A. Remote drivers shall be mounted in an approved NEMA 1 enclosure and shall be located in areas easily accessible to maintenance personnel.

B. Wiring from luminaire to remote driver shall not exceed the driver manufacturer's recommendations for distance.

C. Remote driver shall be clearly labeled indicating fixture served, voltage, panelboard and circuit number served from.

**3.04 GROUNDING**

A. Ground all non-current carrying parts of all lighting luminaires.

B. All grounding shall be accomplished with NRTL tested grounding connectors suitable for this purpose.

**3.05 LABELING**

A. Attach a self-adhesive red dot label, 1/2 in. in diameter, to all luminaires with an integral battery backup and/or those tied into an emergency generator. Labels shall be attached to these fixtures or to adjacent ceiling tiles so that they are readily discernible for testing and maintenance purposes.

**3.06 FINAL CLEANING**

A. Immediately prior to acceptance, damp clean diffusers, luminaire trim, reflectors, louvers, lens, and similar objects of all luminaires. Remove all dirt, corrosion, foreign material, finger marks, and blemishes. Replace all burned out LEDs and failed components.

**3.07 FIELD QUALITY CONTROL**

A. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test of Emergency Lighting: Under supervision of Engineer, interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

D. Replace luminaires damaged during shipment, construction, or installation.

**3.08 STARTUP SERVICE**

A. Comply with requirements for startup specified in Section 260936 "Lighting Controls."

**3.09 ADJUSTING**

A. Provide adjusting the direction of aim of luminaires to suit occupied conditions. Adjustment may be required during hours of darkness.

B. Final distribution shall be acceptable to the Owner and may take several attempts.

**END OF SECTION 26 50 00**

**SECTION 26 55 00**
**LIGHTING CONTROLS**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.02 DESCRIPTION

A. Provide a complete lighting control system as indicated on the Contract Documents and as specified herein.

### 1.03 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.04 QUALITY ASSURANCE

A. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc. correspond to the nomenclature dictated by those manufacturers.

B. Installation shall be accordance with NFPA 70 (National Electrical Code), energy conservation codes, state codes, local codes, and requirements of authority having jurisdiction.

C. Equipment shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of applicable published ANSI, NEMA and IEEE Standards.

D. All equipment shall NRTL tested.

E. All components and assemblies are to be factory pretested.

F. The controls provider must:
   1. Provide equipment from manufacturers for which they maintain a contract, distributorship, are an agent, or other formal arrangement for which documentation can be produced showing authority to sell and service the equipment in this territory.
   2. Demonstrate that they have successfully installed similar systems, utilizing their standard products, for a minimum period of five (5) years.
   3. Employ service technicians who are trained in accordance with the systems manufacturer's recommendations.
   4. Own and demonstrate proficiency in the use of the required test equipment, tools, etc. for the proper installation, set-up, testing and maintenance of the system. If requested, must provide a listing of tools and/or equipment and where appropriate, certifications in the proper training and use of the tools and/or equipment.

### 1.05 SUBMITTALS

A. Submit the following equipment, materials, and products including all components and accessories:
   1. General Equipment
   2. Vacancy/occupancy Sensors
   3. Wiring diagrams
   4. Commissioning Plan

B. Submit the shop drawings and the product data specified below at the same time as a single submittal package.

C. Product Data: Provide equipment data sheets, specifications, wiring diagrams and installation instructions for all required system components.

D. Shop drawings shall include the following at a minimum:

1. Composite custom wiring and/or schematic diagram of each control circuit as proposed to be installed (standard diagrams will not be accepted). Wiring diagrams shall include all system components, including but not limited to: room controllers, digital switches, vacancy/occupancy sensors, photocells, isolated relays, digital I/O interfaces to conference room A/V systems, network interfaces, lighting control panels and associated components.
2. All system devices shall be located per the system manufacturers recommendations. All devices shall be suitable for the building configuration and intended operation.

**1.06 SYSTEM DESCRIPTION**

A. The lighting control system and/or components, as specified and indicated on the drawings to provide the intended and required control of the lighting systems.

**PART 2 - PRODUCTS**

**2.01 GENERAL EQUIPMENT**

A. Switches
   1. Toggle/Snap
      a. Unit shall be quiet operation, quick make/quick break, rated for 20A/120-277V/1hp at 120/277V, side/back wired, with nylon/polycarbonate toggle, self-grounding mounting screw clip plate (not staple), ground terminal and silver alloy contacts. Units shall meet latest Federal Specification WS-896, NEMA WD-1 and UL Test 20.
      b. Acceptable Manufacturers (for single pole units, provide two pole, three way, four way, illuminated handle, keyed, etc. type of the same quality and model).
         1) Hubbell HBL1221
         2) P&S 20AC1
         3) Leviton 1221-2
   2. Low Voltage
      a. Unit shall be button type switch that is configurable from one button to eight buttons using point-to-point low voltage wiring for control of single or multiple loads. Each button shall provide a momentary contact and all share a common return. The switch shall be totally passive and contain no active electronics or power supply. Operation is dependent upon a Class 2 connection to a compatible relay panel or other device that can react to a momentary contact signal.
      b. Each button shall have an LED indicator light that can serve as a status indicator or as a locator light. The LED indicators shall be powered by a 24VDC source originating from the lighting control panel or other device. The button quantities shall be as indicated on the plan views.
      c. Acceptable Manufacturer
         1) Wattstopper LVSW series (Design Make)
         2) Acuity Brands
         3) Hubbell
         4) Approved Equal.
   3. All device colors shall match the surrounding devices and shall be selected by the Architect.

B. Lighting Dimmers
   1. Provide lighting dimmer where indicated suitable for the type of luminaire for even continuous control. Unit shall be rated for the indicated connected load plus 25% minimum (even when ganged). Review luminaire schedule and plans for type and loading. Provide for three-way control as indicated.
   2. Low voltage dimming shall be as recommended by the luminaire manufacturer for magnetic or solid state.
   3. LED dimmers shall be as recommended by the luminaire manufacturer and be listed for use with the associated driver.
   4. Device color shall match the other project devices.

5. Acceptable Manufacturers:
    a. Lutron (Design Make)
    b. Crestron
    c. Acuity Brands
    d. Leviton
    e. Approved equal

C. Time Switches:
1. Digital Lighting Controller:
    a. Photosensor and manual inputs, battery back-up.
    b. Astronomic control with holiday, 7 day and 56 point scheduling.
    c. 120/277V input/control, SPDT 20A output.
    d. NEMA 3R corrosion resistant enclosure with clear cover.
    e. Design Make: NSI-Tork DGLC200A.
2. Time switches shall be provided with NEMA 1 general purpose, surface mount enclosures unless otherwise noted.

D. Photoelectric Controls:
1. Heavy Duty, 1/2 in. Conduit Mounting:
    a. 120 volt, SPST, 2000 watt: Tork Model 2101.

**2.02 VACANCY/OCCUPANCY SENSORS**

A. Vacancy/occupancy Sensors:
1. Vacancy/occupancy sensors shall comply with the following as a minimum:
    a. Zero crossing switching operation (switch on/off only where sine wave is at zero volts) suitable for linear, non-linear and electronic/magnetic fluorescent ballasts for the loads indicated. Where the load to be controlled exceeds the sensor load rating provide a separate relay of adequate rating.
    b. Failure of the unit shall be to the on/closed position or manual operation.
    c. Motion sensitivity adjustment (dip switch or dial) and time delay adjustment (5 to 30 minutes minimum, dip switch or dial).
    d. Line voltage input and switching. Field selectable for 120 or 277 VAC, 60 Hz.
    e. UL listed and have a five (5) year manufacturer full replacement warranty.
    f. Test mode feature to override the set time delay to allow adjusting of the sensitivity.
    g. Sensor locations shall be adjusted during construction and at occupancy as recommended by the manufacturer for optimal sensing and operation.
    h. Operation shall be field selectable with vacancy sensor being manual "on" with close switch/contact upon motion sensing and open after the set amount of time delay without motion or occupancy sensor being automatic on upon motion sensing.
    i. Adjustable controls/settings shall only be accessible when the front cover is removed or from the back of the unit.
    j. Unit color shall match the project devices except for the ceiling-mounted units which shall match the ceiling color. All color selections shall be by the Architect.
    k. Ultrasonic sensing shall not be affected by air movement and shall operate at 32 kHz minimum (shall not interfere with hearing aids or other equipment).
    l. Provide components as needed for the indicated control.
    m. A factory-authorized representative shall coordinate and instruct the startup services of the sensors providing placement recommendations, connection guidance and startup supervision and adjustment.
2. Wall Mounted - Dual Technology:
    a. Unit shall fit into a standard single gang electrical box, have an On/Off button, and utilize PIR and ultrasonic technology motion sensing. Both types of sensing are needed for contact closure but only one (1) is needed to keep it closed.
    b. Minimum Switching Capacity: 120 V - 800 W, 277 V - 1200 W.
    c. The sensing shall be 180 degrees and the sensitivity area to be a minimum of:

1) Major Motion (Walking/Arm Wave): 35 ft. x 30 ft.
2) Minor Motion (Small Motion at Desk): 20 ft. x 15 ft.

d. Ambient light level sensing (adjustable 20-300 fc) to prevent "On" operation when the ambient light level is greater than the setpoint level.
e. High impact resistant sensor lens.
f. Acceptable Manufacturers:
1) Wattstopper DW-100 (Design Make)
2) Hubbell
3) Eaton
4) Acuity Brands

3. Wall Mounted - Dual Technology - Dimmer Switch:
a. Unit shall fit into a standard single gang electrical box, have an on/off button and utilize dual technology (PIR and Ultrasonic) motion sensing. Both types of sensing are needed for contact closure, but only one is needed to keep it closed. Selectable manual or automatic on mode. Provide with 0-10 VDC dimming control with raise and lower buttons.
b. Minimum Switching Capacity: 120 V - 1000 W, 277 V - 1200 W.
c. The sensing shall be 180° and the sensitivity area to be a minimum of:
1) Major Motion (Walking/Arm Wave): 35ft. x 30 ft.
2) Minor Motion (Small Motion at Desk): 20 ft. x 15 ft.
d. Ambient light level sensing (adjustable 20-300 fc) to prevent "on" operation when the ambient light level is greater than the set point level.
e. High impact resistant sensor lens.
f. Dimming Control Signal: 0-10 VDC, with minimum sink current of 50mA. Raise/lower buttons to allow manual dimming of the space luminaires.
g. Acceptable Manufacturers:
1) Wattstopper DW-311 (Design Make)
2) Hubbell
3) Eaton
4) Acuity Brands

4. Ceiling Mounted - Dual Technology (No Subscript):
a. Unit shall mount to standard octagonal box, have auxiliary contact (Form C, 0.5A at 24 VDC), and utilize PIR and ultrasonic technology motion sensing. Both types of sensing are needed for contact closure but only one (1) is needed to keep it closed.
b. Shall have self-contained rated contacts or control a separate switch pack. If a self-contained unit, then the ratings and function shall meet or exceed the switch pack specifications.
c. Sensing shall be 360 degrees with a minimum operating area of:
1) Major Motion (Walking/Arm Wave): 50 ft. x 30 ft.
2) Minor Motion (Small Motion at Desk): 40 ft. x 20 ft.
d. Units shall be suitable for overlap of motion detection areas without reduction in spacing and false operation.
e. Sensing shall be suitable for a ceiling/mounting height of up to 12 ft. minimum.
f. Ambient light level sensing (adjustable 20-300 fc) to prevent "On" operation when the ambient light level is greater than the setpoint level.
g. The maximum depth shall be 1.5 in. below the ceiling/box.
h. Acceptable Manufacturers:
1) Wattstopper DT-300 (Design Make)
2) Hubbell
3) Eaton
4) Acuity Brands

B. Switch Pack:

1. Provide a minimum of one (1) switch pack for each ceiling-mounted vacancy/occupancy sensor. Provide additional units for multiple circuits (quantity to match the quantity of circuits).
2. Unit shall be plenum rated with line voltage side into a metallic box.
3. Low voltage power shall be suitable for a minimum of three (3) sensors. Multiple sensors shall be able to control a single switch pack.
4. Minimum switching capacity shall be 20A (all types of loads) at 120/277 VAC.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Provide all required system components, interconnection wiring and branch circuit power connections as required by the lighting control system manufacturer to meet the intended sequence of operation and system performance requirements. All system wiring shall be in accordance with the system manufacturer's requirements at a minimum.

B. When using wire for connections other than the digital lighting control network (Category 5e with RJ-45 connectors), provide detailed point to point wiring diagrams for every termination. Provide wire specifications and wire colors to simplify contractor termination requirements. All Category 5e cabling and connectors shall be terminated and tested to meet the system manufacturer’s requirements. Category 5e cabling shall have a green thermoplastic jacket to easily identify from other building network cabling, building management system, or other low voltage systems cabling.

C. All line voltage wiring shall be installed in conduit. Terminations shall be done above accessible ceilings or within utility rooms and within a 4"x4" back box and have a suitable cover provided. Digital network devices (room controllers, isolated relays, plug load controllers, etc.) shall be mounted to a junction box and connected as recommended by the system manufacturer.

D. All low voltage control cabling shall be plenum rated. Cabling shall be installed in minimum 3/4" conduit in vertical runs in walls/partitions and inside mechanical/utility rooms. Provide suitable back box as required by the system manufacturer for the device being installed. Above accessible ceilings all control cabling shall be installed within separate J-hook supports located at 3' on center with the cabling neatly bundled. All cabling inside utility rooms without ceilings shall be installed in conduit.

### 3.02 SYSTEM PROGRAMMING

A. Upon completion of the installation, the system shall be programmed by the manufacturer's factory authorized representative who shall verify a complete fully functional system.

B. The system manufacturer shall include separate individual site visits scheduled to complete the system programming and perform the following functions:
1. Initial system startup/programming (time shall be suitable to setup all system devices). A minimum of two days shall be accounted for the system initial setup.
2. Coordination with the owner to develop preferred lighting control scenes, scene illumination levels, button operation and coordinate day lighting requirements prior to final system programming. Once verified with the owner all system components shall be fully programmed and setup.
3. Verification of the system operation (time shall be suitable to test and verify day lighting functions are operating properly). The manufacturer shall provide light meters for verification; time shall be as required for proper testing of the system.
4. The lighting control system manufacturer shall coordinate all room names and scheduling with the owner prior to final setup.
5. The presence of the system manufacturer's service technicians to assist the installing electrician in all of the above is a requirement of this project and proof of time expended shall be provided to the Owner's Representative.

### 3.03 SYSTEM COMMISSIONING

A. The electrical contractor shall provide both the Owner and the electrical engineer with a minimum of ten working days written notice of the system startup and configuration date.

B. Refer to the lighting control details that are part of the Construction Drawings for sequence of operation and commissioning requirements of the project lighting control scenarios.

C. All lighting control systems and components shall be commissioned to verify sensor location, time delay/sensitivity is properly set, auto-on/manual-on, override times, controls, day-lighting control, communications between control panels, and timeclock controls are operating as intended.

D. Calibrate all sensor time delays, sensitivity settings and properly aim to guarantee proper detection of occupants and energy savings.
   1. Adjust time delay so that controlled area remains lighted for 15 minutes after occupant leaves area.

E. Exterior photocells shall be aimed per the manufacturer's installation instructions. Locate and aim to be facing to the north and avoid being blocked by the building architectural features.

F. Provide written or computer-generated documentation on the commissioning of the system including room by room description including:
   1. Sensor parameters, time delays, sensitivities, and daylighting set points.
   2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
   3. Load Parameters (e.g. blink warning, etc.)

### 3.04 SYSTEM TRAINING

A. The Contractor shall provide instruction to the Owner's Representative with regard to use and operation of the system. Obtain signed receipt from Owner's Representative that instruction has been given.

B. The lighting control system's manufacturer shall supply at least one (1) service technician after all systems have been tested and in full operation as described above to assist the installing electrician to demonstrate and instruct the Owner's Representative on the operation, programming and any uniqueness of the control system. Minimum time required for Owner instruction of the system is one (1) eight (8) hour session.
   1. Provide additional instruction and training to the owner to as required to verify the owner is comfortable with the system operation. Time of demonstration and instruction to be at Owner's convenience during normal working hours and shall be scheduled a minimum of ten working days prior.

### 3.05 WARRANTY

A. Provide a five year complete manufacturer’s warranty on all products to be free of manufacturers’ defects.

**END OF SECTION 26 55 00**

**SECTION 27 32 26**
**RING-DOWN EMERGENCY TELEPHONES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Armored emergency phone.

B. Mounting pedestal, backplate and accessories.

### 1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Phone, pedestal and mounting bracket, back plate, wiring requirements and installation instructions..

C. Executed warranty.

### 1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.

B. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Store under cover and elevated above grade.

### 1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 1 - year manufacturer warranty. Complete forms in Owner's name and register with manufacturer.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. G-Tel Enterprises Inc.; Armored Emergency Phone, Model EP 3500; www.payphone.com

B. Substitutions: See Section 01 60 00 - Product Requirements.

C. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

### 2.02 MATERIALS

A. 14-gauge stainless steel.

B. Tamper resistant locking system.

### 2.03 ACCESSORIES

A. Mount:
   1. Pedestal: PRO 42-2LP 42″ Low Profile Pedestald: www.payphone.com.
      a. Black powder coated.
      b. Low Profile 2″ neck reach, 2″ square x .120″ wall tube.
      c. 4″ x 4″ x .120″ face plate.
      d. 5″ x 5″ x .25″ base plate.
      e. Cover plate.
   2. Backplate and housing: as recommended by manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verification of Conditions: Verify underslab conduit is in the correct location as indicated on the drawings.

### 3.02 INSTALLATION

A. Install in accordance with manufacturer's written instructions.

B. Program phone to emergency contact provided by owner.

### 3.03 PROTECTION

A. Protect installed phone and pedestal from subsequent construction operations.

**END OF SECTION 27 32 26**

**SECTION 28 10 00**
**ACCESS CONTROL**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. **NOTE: THIS SECTION IS PROVIDED FOR REFERENCE ONLY**

B. Access control system requirements.

C. Access control units and software.

D. Access control point peripherals, including readers and keypads.

### 1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Electrically operated door hardware, for interface with access control system.

B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

### 1.03 DEFINITIONS

A. Access Control Cloud Services: Subscription-based hosted application utilizing Software as a Service (SaaS) delivery model in lieu of on-premises servers/software.

### 1.04 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 294 - Access Control System Units; Current Edition, Including All Revisions.

### 1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other installers to provide suitable door hardware as required for both access control functionality and code compliance.
   2. Coordinate the placement of readers with millwork, furniture, equipment, etc. installed under other sections or by others.
   3. Coordinate the work with other installers to provide power for equipment at required locations.
   4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Access Control Cloud Services:
   1. Subscription fees to be paid by Owner.
   2. Obtain Owner approval of subscription fees and terms of service prior to submittal.

C. Preinstallation Meetings:
   1. Conduct meeting with facility representative to review reader and equipment locations.
   2. Conduct meeting with facility representative and other related equipment manufacturers to discuss access control system interface requirements.

### 1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Include plan views indicating locations of system components and proposed size, type, and routing of conduits and/or cables. Include elevations and details of proposed equipment arrangements. Include system interconnection schematic diagrams. Include requirements for interface with other systems.

C. Product Data: Provide manufacturer's standard catalog pages and data sheets for each system component. Include ratings, configurations, standard wiring diagrams, dimensions, finishes, service condition requirements, and installed features.

D. Design Data: Standby battery/UPS calculations.

E. Certify that proposed system design and components meet or exceed specified requirements.

F. Evidence of qualifications for manufacturer.

G. Evidence of qualifications for installer.

H. Evidence of qualifications for maintenance contractor (if different entity from installer).

I. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.

J. Manufacturer’s detailed field testing procedures.

K. Project Record Documents: Record actual locations of system components and installed wiring arrangements and routing.

L. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

M. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

N. Software: One copy of software not resident in read-only memory.

## 1.07 QUALITY ASSURANCE

A. Comply with the following:
   1. NFPA 70.
   2. The requirements of the local authorities having jurisdiction.
   3. Applicable TIA/EIA standards.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience with access control systems of similar size, type, and complexity and providing contract maintenance service as a regular part of their business; authorized manufacturer's representative.

D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

## 1.08 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

B. Store products in manufacturer's unopened packaging, keep dry and protect from damage until ready for installation.

## 1.09 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

## 1.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide minimum one year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Access Control System:
   1. Basis of Design: MCS Tech Services; www.MCSTechinc.com.
   2. Motorola Solutions: www.motorolasolutions.com
   3. Bosch Security Systems: www.boschsecurity.us/#sle.
   4. Brivo: www.brivo.com/#sle.
   5. Honeywell International, Inc: www.honeywellaccess.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 ACCESS CONTROL SYSTEM REQUIREMENTS

A. Provide new access control system consisting of required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.

B. Interface with Other Systems:
   1. Provide products compatible with other systems requiring interface with access control system.
   2. Interface with electrically operated door hardware as specified in Section 08 71 00.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.
   1. Access Control Units and Readers: Listed and labeled as complying with UL 294.

### 2.03 ACCESS CONTROL UNITS AND SOFTWARE

A. Provide access control units and software compatible with readers to be connected.

B. Unless otherwise indicated, provide software and licenses required for fully operational system.

### 2.04 ACCESS CONTROL POINT PERIPHERALS

A. Provide devices compatible with control units and software.

B. Provide devices suitable for operation under the service conditions at the installed location.

C. Door Locking Devices (Electric Strikes and Magnetic Locks): Comply with Section 08 71 00.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install access control system in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Provide grounding and bonding in accordance with Section 26 05 26.

D. Identify system wiring and components in accordance with Section 26 05 53.

### 3.02 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Prepare and start system in accordance with manufacturer's instructions.

C. Program system parameters according to requirements of Owner.

D. Test for proper interface with other systems.

E. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

### 3.03 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**END OF SECTION 28 10 00**

**SECTION 28 31 02**
**ANALOG ADDRESSABLE FIRE ALARM SYSTEM**

## PART 1 - GENERAL

### 1.01 REFERENCE STANDARDS

A. NECA 305 - Standard for Fire Alarm System Job Practices; 2018.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.

D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

E. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems; Current Edition, Including All Revisions.

F. UL 864 - Control Units and Accessories for Fire Alarm Systems; Current Edition, Including All Revisions.

G. UL 2075 - Standard for Gas and Vapor Detectors and Sensors; Current Edition, Including All Revisions.

### 1.02 WORK INCLUDED

A. Provide labor, materials, equipment and services to perform operations required for the complete installation of a fully operational analog addressable fire alarm system and related Work as described in the Contract Documents.

B. Provide system as approved by local Fire Marshal and the Authority Having Jurisdiction (AHJ). System materials and installation shall be in accordance with the manufacturer's recommendations.

### 1.03 QUALITY ASSURANCE

A. All methods of construction, details of workmanship that are not specifically described or indicated in the contract documents, shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of the specifications. The equipment specified is based upon the acceptable manufacturers listed. Equipment types, device ratings, dimensions, etc. correspond to the nomenclature dictated by those manufacturers. All equipment shall be tested at the factory. Unless specified elsewhere, standard factory inspection and operational tests will be acceptable.

B. Installation shall be in accordance with NFPA-70 (National Electrical Code), NFPA-72 (National Fire Alarm Code), AHJ, state codes, local codes, requirements of authority having jurisdiction and the contract documents. Installer shall be certified in the State of New York for fire alarm installation.

C. Equipment shall be designed, manufactured, assembled, and tested in accordance with the latest revisions of applicable published UL, NFPA, ANSI, NEMA and IEEE Standards. All system equipment shall be compatible and of the same manufacturer.

D. Each item of the fire alarm system shall be listed as a product of a single fire alarm system manufacturer and be listed by a NRTL.

E. System installation shall be under the supervision of an accredited factory representative. Final connections to the FACP, annunciator panel and any other panels shall be by the factory representative.

F. The system provider must:
   1. Provide equipment from a single manufacturer for which they maintain a contract, distributorship, are an agent, or other formal arrangement for which documentation can be produced showing authority to sell and service the equipment in this territory.

2. Demonstrate that they have successfully installed these systems, utilizing their standard products, for a period of five (5) years minimum.
3. Maintain a service organization to provide both normal and emergency service. Emergency service must be available 24 hours per day, 365 days per year and staff must be adequate to respond within 2 hours of an emergency call.
4. Have a service location not more than 50 miles from the project location.
5. Maintain adequate spare parts inventory to provide both normal and emergency service.
6. Employ service technicians who are trained in accordance with the systems manufacturer's recommendations.
7. Own and demonstrate proficiency in the use of the required test equipment, tools, etc. for the proper installation, set-up, testing and maintenance of the system. If requested, provide a listing of tools and/or equipment and where appropriate, certifications in the proper training and use of the tools and/or equipment.
8. Provide all system programming to deliver a customized system to the Owner ready for use.
9. All system programming is to be completed to the satisfaction of the Owner. If after preliminary use of the system, and/or training, the increased understanding of the system's features and capabilities necessitates reprogramming to any extent, it is to be performed at no additional cost.
10. Provide a minimum of two system inspections/tests each year during the warranty period as described in NFPA 72. Needed and requested system programming changes shall be provided at these times.
11. Warranty period shall be as described elsewhere with two years being minimum. Provide a service contract for the Owner review for two years beyond the warranty period. Warranty shall include all parts, materials, labor, transportation, etc.

**1.04 SYSTEM DESCRIPTION**

A. The system shall constantly monitor all initiation devices and notification circuits for any abnormalities or alarm conditions. System shall sample/poll each addressable device no less than every 10 seconds.

B. The system operation subsequent to the alarm activation by any initiating device shall be as follows:
   1. All audible alarm notification appliances within corresponding building or designated area shall provide a common audible fire alarm signal until the System Reset Key or the Signal Silence Key is depressed.
   2. All visual alarm notification appliances shall flash continuously and synchronized until the system is reset or silenced.
   3. The remote central monitoring station shall be notified automatically until the System Reset Key or the Signal Silence Key is depressed.
   4. Shutdown of the corresponding HVAC system equipment shall occur with a supervisory alarm until the system is reset. All fans over 2000 cfm shall be shut down.
   5. Activation of all programmed outputs assigned to the initiating device shall occur until the system is reset or the silence key is depressed.
   6. The alarm shall be displayed at the local Fire Alarm Control Panel (FACP) and the fire alarm annunciator panel. A printout shall be produced at the FACP.
   7. The system alarm LED shall flash on the control panel and the fire alarm annunciator panel until the alarm has been acknowledged/reset. Once acknowledged, this same LED shall latch on. A subsequent alarm received shall flash the system alarm LED on the control panel and annunciator. The LCD display shall show the new alarm information.
   8. A pulsing audible alarm tone shall occur within the local building control panel and, where applicable, the fire alarm annunciator panel until the event has been acknowledged.
   9. Alarms shall be entered into the system event log history.
   10. Refer to Appendix A for operational/sequence matrix.

C. Any subsequent alarm shall follow the operation described above.

D. The activation by any system smoke detector or sensor shall initiate an alarm verification operation whereby the panel will reset the activated detector and wait for a second alarm activation. If, within a preset time after resetting, a second alarm is reported from the same or any other smoke detector, the system shall process the alarm as described previously. If no second alarm occurs within the prescribed time, the system shall resume normal operation. The alarm verification shall operate only on smoke detector alarms. Other activated initiating devices shall be processed immediately. The alarm verification operation shall be selectable by device.

E. A manual evacuation (drill) switch shall be provided to operate the alarm notification appliances without causing other control circuits to be activated. However, should an actual alarm occur, all alarm functions shall occur as described previously.

F. The system shall have a password(s) to allow the operator to display all alarms, troubles, and supervisory service conditions log history including the time of each occurrence. This shall be able to be viewed from the front of the control panel, annunciator panel or from a computer connected to the FACP.

G. The actuation of the "walk test" program at the control panel shall activate the "Walk Test" mode of the system which shall cause the following to occur:
   1. The remote central monitoring station connection shall be bypassed.
   2. Only audible and visual appliances shall be operated. Other alarm functions (elevator recall, HVAC shutdown, etc.) shall not be affected.
   3. Walk test shall be selectable by circuit or circuits.
   4. Actual alarms received during a "Walk Test" shall cause the control panel to go into alarm and override the walk test mode.
   5. The control panel shall show trouble conditions.
   6. The walk test activation of any initiation device shall cause the audible signals to activate for two seconds or a distinguishable audible.
   7. The panel shall automatically reset itself after signaling is complete.
   8. The control panel shall automatically return to normal condition if there is no activity on a walk test circuit for a period of 30 minutes.

H. Any momentary opening of an initiating or notification appliance circuit wiring shall cause an audible signal to sound at the Fire Alarm Control Panel and, where applicable, the annunciator panel for four seconds indicating a trouble condition.

I. Duct smoke detectors associated with duct dampers shall have an addressable control module to operate the duct damper. In the event of an alarm initiation by the duct smoke detector or the associated air handling unit/fan shut down the duct damper shall be closed. Control wiring shall be provided to shut the damper(s) when the associated air handling unit is not operational if the detector is not in the duct. Provide power supplies, wiring and accessories as needed for this operation.

J. Provide a minimum of two Form C contacts at the building's fire alarm control panel. This contact shall activate upon activation of any fire alarm initiating device.

K. Provide connection to the fire pump controller and addressable initiation modules to monitor the following points as separate and distinctive signals:
   1. Pump running.
   2. Phase reversal.
   3. Switch not in automatic.
   4. Trouble.
   5. Power loss.

**1.05 SUPERVISION**

A. The system shall utilize independently supervised initiation device circuits. The alarm activation of any initiation device shall not prevent the subsequent alarm operation of any other initiation device.

B. Notification appliance circuits shall be supervised to indicate an open or short circuit condition.

C. The incoming power to the system shall be supervised so that any power failure must be audible and visually indicated at the control panel and the remote annunciator. A green "power on" LED shall be displayed continuously while incoming power is present. This shall be a trouble alarm.

D. The system batteries shall be supervised so that a low battery condition or disconnection of the battery shall be audibly and visually indicated at the control panel and the remote annunciator. This shall be a trouble alarm.

E. The system shall have provisions for disabling and enabling all circuits individually for maintenance or testing purposes.

**1.06 SUBMITTALS**

A. Provide a complete system submittal prior to ordering of equipment and installation including but not limited to:
   1. Comply with recommendations and requirements in “Documentation” section of “Fundamentals” chapter in NFPA 72.
   2. Complete equipment list.
   3. Catalog descriptive literature for all equipment. This shall include a description of the unit, ratings, functions, capability, materials and compatibility with other components.
   4. Riser Wiring Diagram showing all equipment, devices, device addresses, connections, control connections, remote notification connection(s), wire quantities and sizes.
   5. Floor plan indicating equipment and device locations, addresses, power circuit information with power panel location, notification circuiting, initiation circuiting, control circuiting and any system applicable building characteristics (ceiling heights, structural members impeding detection, etc.). Contact the Engineer for an electronic copy of the project floor plans. Engineer logo shall be included in final drawing.
   6. Typical Terminal Wiring Diagram for each type of device.
   7. Terminal wiring Diagram for all Fire Alarm equipment.
   8. Calculations including:
      a. Battery sizing calculations indicating total number of power devices, load associated with each type device, backup period and recommended battery capacity (AH).
      b. Voltage drop calculations with actual equipment loads used to derive battery back-up ampere-hour rating and individual circuit voltage drop (indicate the wire size to be used and the associated voltage drop with the allowed voltage drop) for each circuit.
   9. Input/output matrix.
   10. Complete console enclosure and equipment configuration.

B. Submittal package, calculations and system wiring shall be performed/collected/signed by a NICET Level III technician.

C. If required by the Authority Having Jurisdiction (AHJ) provide a submission of all requested information for review and comment by the AHJ. All AHJ comments shall be incorporated and resubmitted until approved.

D. Test reports at the completion of the project. Testing shall be of all system devices, equipment, circuits, features and functions.

**1.07 OPERATIONS AND MAINTENANCE MATERIAL SUBMITTALS**

A. Provide three (3) sets of keys to all panels, manual stations, etc., to the Owner's Representative.

B. All spare equipment.

C. Provide a copy of the system programming to the Owner on a CD/DVD disk or flash drive.

D. Provide to the Owner the system Operation Manuals as specified, that shall include as a minimum:
   1. Bill of Material.

2. Catalog descriptive literature for all equipment. This shall include a description of the unit, ratings, functions, capability, materials and compatibility with other components.
3. Riser Wiring Diagram showing all equipment, devices, device addresses, connections, control connections, remote notification connection(s), wire quantities and sizes.
4. Floor plan indicating equipment and device locations, addresses, power circuit information with power panel location, notification circuiting, initiation circuiting and control circuiting. Contact the Engineer for a copy of the project floor plans.
5. Instruction report starting when instruction was given and who was in attendance, signed by Owner's Representative.
6. A written test report from an authorized representative of the equipment manufacturer that each device and overall system operation has been 100% tested and approved.
7. Certificate of Completion as described in NFPA-72.
8. A two (2) year warranty in accordance with the Basic Requirements of these Specifications shall be provided for this system.
9. Provide complete O&M Manual for Engineer review. Upon approval provide complete submission including all materials listed here to the Owner.

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

A. The project fire alarm system shall comply with and be in accordance with the drawings and specifications. All system equipment and materials shall be of the same manufacturer unless otherwise indicated. System and component acceptable manufacturers include the following unless otherwise indicated:
   1. Notifier by Honeywell
   2. EST by Edwards
   3. Simplex by Johnson Controls

### 2.02 FIRE ALARM SYSTEM

A. The fire alarm system shall be comprised of the components specified as a minimum and also include components not indicated but required for a complete and operable system as described herein.

B. The system and all its components shall be UL listed and in accordance with NFPA 72, local and state codes.

C. The system shall have 25% spare capacity. This shall include all individual notification circuits, initiation circuits, initiating modules, alarm modules, power supplies, batteries, central processing unit memory and printed circuit card space. System initiation device and control device capacity shall be a minimum of the indicated percentage over the shown quantity or 250 whichever is greater.

D. Each initiating device shall have an individual address for system communication. The system addresses shall not exceed seven digits. Each address, initiation circuit, notification circuit and control point shall have an individual identification description.

E. System shall shut down all air handlers more than 2,000 cfm upon an alarm.

### 2.03 FIRE ALARM CONTROL PANEL (FACP)

A. The system shall be entirely solid state, microprocessor based, use digital transmission and shall be field programmable. All system programming including field modifications shall be stored in non-volatile memory. Field modifications shall be automatically stored without special actions. The panel shall be designed and manufactured expressly for the intent to detect the presence of fire and to provide indication of such detection. Panel shall contain as a minimum power supply(s), control module, main control printed circuit board, initiation modules, notification modules, terminals and back up battery(s). Control module shall have 80 character backlit LCD display and twelve control buttons (four being field assignable), minimum. Display shall indicate the battery voltage at all times.

B. The system shall be modular in design to allow for future expansion with a minimum of hardware additions.

C. The FACP shall be located where shown on the drawings. Enclosures shall accept all system items for an aesthetically suitable operator's console. Enclosures shall be of modular size to allow surface mounting of multiple boxes adjacent to each other, shall have hinged solid metal doors and contain a lock with a key common to all system devices. Enclosure shall have a red finish.

D. The FACP shall operate its integral LCD Display through an RS-232C port operating up to 9600 baud to indicate all operator transactions, alarms, trouble reports and any other conditions specified by system programming.

E. Conditions of the system shall be indicated at the operator interface by LED's. These conditions shall be alarm, supervisory, trouble and alarm silenced. An LCD 2 line, 40 character per line display shall also be included. It shall display "SYSTEM IS NORMAL" with the date and time under normal circumstances. The LCD display shall also indicate type of alarm, point status, number of alarms and location. Through the use of function keys, historical data can also be displayed.

F. The FACP shall include a password (three (3) levels of protection with individual passwords, minimum) protected key pad for access to programming, special functions and all system features.

G. Any event initiated by the FACP due to an alarm input shall be retained in nonvolatile EPROM memory. The FACP shall also have sufficient memory for 1200 individual alarm/trouble events.

H. The FACP shall have the following user connection types:
   1. Ethernet connection for a computer, personal data device or printer. Connection shall allow for programming changes, history download, setting review/changes, etc.
   2. RS 232 port for connection of a serial printer.

I. Provide modules for off-site monitoring.

J. Battery and charger shall be as specified within this section.

**2.04 REMOTE TRANSPONDER UNIT (RTU)**

A. The RTU shall function as a subpanel to the FACP, and shall have all the initiation, notification, control, battery, display functions, etc. as the FACP. In the event of failure of the FACP the RTU shall continue to function as a standalone system. All remote notification shall be through the FACP. Provide power circuits to the RTU similar to the FACP. The spare capacity indicated for the FACP shall also be provided in the RTU's. All trouble and alarm conditions at the RTU shall be transmitted to the FACP for suitable operation.

B. RTU's shall contain their own processors and memory and function independently of the FACP but utilize the same base programming. Programming functions in the RTU shall be accessible through the FACP and RTU.

C. The RTU shall be capable of communication with addressable devices that are uniquely identified by an address. Wiring shall be shielded twisted pair cable. The system must allow up to 2,500 feet wire length to the furthest addressable device. T-tapping of the communications channel or multiple loop channels shall be supported.

D. Enclosures shall be of modular size to allow surface mounting of multiple boxes adjacent to each other, shall have hinged solid metal doors and contain a lock with a key common to all system devices.

E. The FACP shall communicate with RTU's through dual supervised data lines. Data lines shall be standard #18 AWG twisted shielded pair minimum or as recommended by the manufacturer. In normal operation, each line shall be used alternately on intervals to maintain line integrity. Should either data line fail, system shall automatically revert to alternate data line and data line trouble shall be reported to operator. The FACP shall automatically "re-boot" after data line is restored. Minimum allowable distance between the FACP and RTU shall be 2500 ft.

F. Design Make: To match FACP.

## 2.05 REMOTE ANNUNCIATOR

A. Wall mount within a surface box. Maximum depth of 4 in., stainless steel trim. Nominal dimensions of 4 in. x 12 in.

B. Annunciation shall be by two line by 40 character LCD display to provide system information and alarm/trouble description.

C. Unit power and control shall be from the FACP. Unit circuiting shall be supervised.

D. Provide trouble signal with audible buzzer, silencing switch and system reset. All pushbuttons shall be inoperable without keyswitch activated. Pushbuttons for alarm acknowledge, silence and alarm reset shall be standard on the front with a description. Shall include a minimum of four auxiliary switches/pushbuttons to be programmed as coordinated with the owner (possible options are door holder release override, manual alarm initiation, elevator capture bypass, etc.).

E. Tamper-resistant front panel screws.

## 2.06 VENTILATION FAN SHUTDOWN CONTROL

A. Provide supervised normally closed relays and contactors for connection into the fan motor control circuits ahead of all automatic devices.

B. Sequence fan shutdown for every air distribution system over 2,000 cfm. Provide duct detectors in return of systems over 2,000 cfm and in return at each floor of systems over 15,000 cfm.

C. Provide drill bypass feature, locate switch on Fire Alarm Control Panel and label "DRILL-FAN SHUTDOWN BYPASS". Buzzer shall sound continuously while in bypass mode.

D. Provide fan reset feature, locate switch on Fire Alarm Control Panel and label "FAN RESET".

## 2.07 INITIATION DEVICES

A. General:
   1. Provide analog addressable smoke and thermal sensors as shown. All detectors, control modules, monitor modules and all other initiation devices shall communicate with twisted pair cable and have an individual address. Peripheral devices shall be of the same manufacturer as the FACP.
   2. Spot type detectors shall utilize the same interchangeable bases.
   3. If a device is removed or taken out of service a trouble signal shall be initiated.

B. Manual Pull Stations:
   1. Noncoded pull-down type, double action (push then pull down) manual addressable units with front keyed test/reset. Units shall be semi-flush where installed in construction with hollow or block walls. Where construction does not allow semi-flush mounting then unit shall be surface mounted utilizing the manufacturers back box. Each unit shall have a distinct address. Units shall be key reset.
   2. Units installed outdoors or in potentially wet locations shall be rated for such conditions.
   3. Bright red finish with white lettering "FIRE ALARM".

C. Photoelectric Smoke Detector:
   1. The photoelectric detector shall operate on the photo electronic principle and provide an analog signal to the system indicating the amount of smoke. Detector shall be an analog addressable type.
   2. The detector shall incorporate a built in type identification so the system can identify the type of detector. The sensor shall be continually monitored to measure any change in their sensitivity because of the environment (dirt, smoke, temperature, humidity, etc.). Unit shall not be affected by exterior light or EMF.
   3. The detector shall be designed and arranged to prevent interference from exterior electromagnetic fields and light.

4. The detector shall provide advance indication of the analog value of the products of combustion to the FACP indicating that maintenance is required in order to insure normal operation. The detector sensitivity shall be adjustable per device (within UL limits) and be set at the FACP for continuous or variable based on time of day. There shall be a minimum of six (6) selectable sensitivity levels. The individual detector sensitivity setting shall be adjusted to meet the building/space characteristics and operation. The detector shall monitor the obscuration continuously and raise the obscuration level to compensate for a dirty sensor to maintain the set sensitivity.
5. Detectors shall be designed for twistlock mounting to a separate base assembly. Provide manufacturer's recommended back box suitable for surface mounting where required.
6. The detector base shall have terminals for making all connections; no soldering shall be required. It shall be possible to secure the detector to the base with a concealed socket headscrew to prevent unauthorized tampering.
7. Smoke detectors shall be UL 268 listed and FM approved.
8. All smoke detectors shall be field checked and set to meet the prevailing conditions of the premise and any Owner requests. All such work shall be performed by an authorized representative of the manufacturer trained in such procedures.
9. Photoelectric type smoke detection shall be used for smoke detection unless indicated otherwise indicated.

D. Duct Smoke Detector:
   1. Exterior Duct Mounted Smoke Detector
      a. Detector shall be a photoelectric type as described above that shall be activated by the presence of combustion products.
      b. The detector head shall be a plug-in unit. The unit shall contain no moving parts and have two chambers. One chamber shall be for fire detection and the second chamber shall function as a reference, to stabilize the detector for changes in environmental temperature, humidity and pressure. It shall be possible to electrically check detectors sensitivity, using a sensitivity test set, or equivalent, and readjust the detectors sensitivity as required.
      c. Housing shall have ports for testing and a clear cover panel.
      d. The detector base shall have terminals for making all connections; no soldering shall be required. It shall be possible to secure the detector in the base with a concealed socket-head screw to prevent unauthorized tampering.
      e. Smoke detectors shall be listed by Underwriter's Laboratories, Inc. and approved by Factory Mutual Insurance Company.
      f. Provide complete with sampling tubes. Size sampling tubes for 80% of the width of the duct. Locate in ductwork for the indicated system and in accordance with the manufacturer's recommendations. Unit shall be rated for air velocities of 300 to 4000 fpm as a minimum.
   2. Provide addressable control module and 120V power for smoke damper operation.
   3. Provide a remote indicating light/key test switch for each duct detector and mount in a local utility room with a sign indicating the system and location of the duct detector (i.e. AHU-2, Second Floor East End).

E. Carbon Monoxide (CO) Detector:
   1. Detector shall sense the level of CO concentration within a space and provide analog addressable signal to the system and be UL 2075 listed. Unit shall have a minimum life span of 10 years without replacement/recalibration.
   2. Detector shall connect to the system addressable circuiting.
   3. Alarm level shall be adjusted at the control panel. Upon an alarm the local notification shall sound and a trouble alarm initiated.

F. Heat Detector:
   1. The heat detector shall be a thermal sensor and shall constantly monitor the space temperature and constantly report this to the system. The unit shall be analog addressable.

2. The sensor shall use dual solid state thermistors and shall monitor the ambient temperature from 32 degrees F, to 155 degrees F and provide a fast response to rapid increase in temperature. The sensor shall send data to the FACP representing the analog value of the ambient temperature. The FACP shall be suitable to monitor for set temperature (selectable by detector for 135 or 155 degrees F) and rate of rise (selectable by detector for 15 or 20 degrees F per minute). Individual detector thermal settings shall be adjusted for the building/space characteristics and operation but shall initially be set to 135 degrees F set temperature and 15 degrees F per minute rate of rise.
3. Detectors shall be designed for twistlock mounting to a separate base assembly. Provide back box suitable for surface mounting where required.
4. The detector base shall have terminals for making all connections; no soldering shall be required. It shall be possible to secure the detector in the base with a concealed socket headscrew to prevent unauthorized tampering.
5. Smoke detectors shall be UL 268 listed and FM approved.
6. All thermal sensors shall be field checked and set to meet the prevailing conditions of the premise. All such work shall be performed by an authorized representative of the manufacturer trained in such procedures.

G. Addressable Initiation Module (AIM):
1. The addressable initiation module shall be used to connect supervised conventional initiating device or zone of supervised conventional initiating devices (water flow switches, tamper switches, manual pull stations, (4) wire smoke detectors, conventional (4) wire duct detectors, fire pump alarms, dry chemical fire extinguisher control panels, etc.) to one of the system's addressable circuits.
2. The module shall provide address setting means using rotary decimal switches and also store an internal identifying code which the control panel shall use to identify the type of device.
3. The module shall contain an integral LED that flashes each time the unit is polled.

**2.08 NOTIFICATION APPLIANCES**

A. Horns:
1. 24 volts DC.
2. Basic grille type with powder coated red finish paint.
3. Horn shall be rated 94 dBA (anechoic chamber) at 10 feet. Output shall be selectable steady tone or coded. Provide dampening devices to reduce unit output by 5dBA for a minimum of 40% of the system horn units and install as needed to meet the Owner's needs.
4. Units shall be semi-flush where installed in construction with hollow or block walls. Where construction does not allow semi-flush mounting then unit shall be surface mounted utilizing the manufacturers back box.
5. Units installed outdoors or in potentially wet locations shall be rated for such conditions.
6. Provide directional projector where noted on the Drawings.
7. Provide backbox and grille for fully recessed installations; 4 in. deep box maximum.
8. Horn for carbon monoxide alarm notification shall meet the requirements above but have a white finish color, have the word "ALERT" imprinted on the device and have a temporal Code 4 alarm.

B. Strobe Unit:
1. 24 volts DC with built-in Xenon Flasher; two watts maximum. Pulse duration shall be 0.2 seconds with maximum duty cycle of 40%. Illumination intensity shall be field selectable for 15/30/75/110 candela or 135/177/185 candela as applicable for the location. Output setting shall be 15 candela in corridors, 75 candela in general areas, 177 candela in sleeping areas or as indicated. Flash rate minimum 1 Hz, maximum 2 Hz. Units within building shall flash in synchronization.
2. Protruding pyramid shaped lexan lens with reflector and the word "FIRE" imprinted on the lens.

3. Rated life shall be a minimum of 500 hours of continuous operation.
4. Units installed outdoors or in potentially wet locations shall be rated for such conditions.
5. Units shall be semi-flush where installed in construction with hollow or block walls. Where construction does not allow semi-flush mounting then unit shall be surface mounted utilizing the manufacturers back box. Wall or ceiling mounted as noted on the Drawings.
6. Provide surface backbox for surface installation; 4 in. deep maximum.
7. Strobe for carbon monoxide alarm notification shall meet the requirements above but have a white finish color and have the word "ALERT" imprinted on the device.

C. Combination Horn-Strobe Units:
1. Unit shall be a combination of the horn and strobe units specified above in a single manufactured unit.

**2.09 ADDRESSABLE CONTROL MODULE**

A. The addressable control module shall have an individual system address, be supervised and control an output dry contact from indication from the FACP. This can be used to control or have an input to elevator controls, notification appliances, door holder circuits, fans systems, etc. as indicated. Output contacts shall be suitably rated for the intended amperage and be two pole double throw. Modules shall be connected to the addressable loop(s).

B. The unit shall control an output relay (dry contact form C). The module shall mount in a 4 in. square, 2-1/8 in. deep electrical box.

C. The module shall contain an integral LED that shall flash each time the module is polled.

D. The module shall provide address setting means using rotary decimal switches and also store an internal identifying code which the control panel shall use to identify the type of device. Each unit shall have a separate address and be connected to the system addressable signaling circuit.

**2.10 AUTOMATIC DIALER**

A. Provide automatic tie to telephone line upon activation of the fire alarm system and transmission of prerecorded message. Provide two telephone lines from the building service individually routed to the FACP and terminated.

B. Ten minute digitally stored message capacity.

C. Provide automatic line seizure.

D. Provide automatic telephone dialing to a prearranged telephone line. System shall have standard pre-recorded message stored in the memory. Record and store custom message as indicated by the Owner or call station.

**2.11 DIGITAL COMMUNICATOR**

A. The digital fire communicator shall be installed in the FACP or mounted in a separate enclosure. The communicator shall be powered by 24 VDC from the FACP and shall report four (4) conditions - (2) alarm, (1) trouble and (1) supervisory. The unit shall have a built in auxiliary relay output which is programmable for alarm or trouble conditions, and shall be capable of sending a distinctive AC power failure report.

B. Install all wiring in accordance with manufacturer's recommendations. All wiring shall be completely tested as directed by the manufacturer, and a written test report submitted to them for approval. Their approval shall be obtained before connecting any devices. The system manufacturer, by their approval of the test report, shall assume all responsibility for all installed wiring.

C. The communicator shall have the following features: visual and audible trouble indications; supervised or unsupervised input channels, dual phone line interface with line seizure; local and remote programming and automatic 24-hour test.

D. The communicator shall be UL 864 listed and meet the requirements of NFPA 72 Chapter 4 for supervising station fire alarm systems.

## 2.12 NOTIFICATION APPLIANCE CIRCUIT EXTENDER (NAC)

A. Unit shall provide additional notification appliance circuit capability for new or existing system and be utilized for horns and strobe units.

B. Connections to the unit shall include power, notification appliance circuit output circuits and addressable control input or notification circuit input. The power circuit shall be from an emergency source if available in the building.

C. Notification appliance circuit capability shall be four Class B or Class A, 2A, 24VDC minimum. Selectable for synchronized or not.

D. Power supply shall be rated for 8A minimum at 24VDC for circuit power use and battery charging. Battery and charger shall be as specified within this section.

E. Unit shall provide output circuit/operation/battery/power/status monitoring and trouble signal to FACP as needed.

F. Provide with battery and charger. Battery to be sized for backup as indicated for FACP.

G. Operation: upon a signal through the addressable control input or the notification appliance circuit indicating a system alarm.

H. Use: Units can be utilized where indicated or where building is greater than 60,000square feet or over six stories in height. There shall be a minimum of one unit for each floor.

## 2.13 CENTRAL STATION MONITORING

A. Make all arrangements for, and pay all costs for a UL listed central station monitoring service to monitor the fire alarm system through the digital communicator for a period of one (1) year.

## 2.14 BATTERY AND CHARGER

A. Standby power shall be provided through 24 volt DC battery and automatic charger.

B. Provide sealed lead-calcium batteries suitable for a minimum of 24 hours of battery standby. When the system is operating on the battery supply, a trouble condition shall be generated. When utility power is restored, the system shall revert back to 120 VAC supply without any operator action.

C. Provide cell reversal protection.

D. Battery life expectancy shall be ten (10) years minimum.

E. Charger shall be self-regulating, solid state, type, automatic with capability to fully charge the discharged battery within 48 hours.

F. Locate charger within the FACP enclosure. Locate batteries in FACP enclosure.

## 2.15 FIRE DEPARTMENT RADIO SIGNAL AMPLIFICATION SYSTEM

A. The radio amplification system shall provide suitable radio coverage throughout the building and be acceptable to the jurisdictional fire department.

B. Bi-directional amplifiers (BDA) shall be coordinated with and be approved by the project local Fire Marshal and Fire Department for amplification of the fire department portable radio signals. Unit enclosure shall be NEMA 4 minimum. The unit shall have battery backup sized for 100% load for 2 hours if supplied from and emergency power supply or 12 hours if normal power in a NEMA 3R enclosure.

C. The system shall consist of a donor antenna, bidirectional signal amplifier, integrated surge protection, coaxial cable, splitters, 12 antennas per floor (evenly spaced across the area), two (2) 120V/20A circuits to the amplifier, associated cabling/supports/etc. The system shall be fully tested with the fire department until acceptable.

D. The system shall have networked or dry contact communication with the FACP to indicate the supervisory conditions indicated below. If dry contacts used then provide addressable initiation module for each condition. Circuits shall be supervised.
   1. Loss of AC power supply.

2. System battery charger(s) failure.
3. Malfunction of the donor antenna(s).
4. Failure of active RF-emitting devices.
5. Low battery.
6. Failure of critical system components.

E. The system shall have suitable radio licensing, be in accordance with the FCC and meet the requirements of the Fire Code of New Jersey.

F. Acceptable Manufacturers
1. Fire alarm system manufacturer.
2. Manufacturer listed for use with the fire alarm system manufacturer.

**PART 3 - EXECUTION**

**3.01 INSTALLATION OF EQUIPMENT**

A. Comply with NECA 305, NFPA 72, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install electrical wiring to comply with requirements in NFPA 70.
1. Devices placed in service before other trades have completed cleanup must be replaced.
2. Devices installed, but not yet placed, in service must be protected from construction dust, debris, dirt, moisture, and damage in accordance with manufacturer's written storage instructions.

B. Building spaces shall have suitable environmental conditions to meet the system/equipment manufacturer requirements prior to installation and operation.

C. All surface mounted devices shall be mounted on a special box furnished by fire alarm equipment manufacturer. Total assembly shall be secure, smooth contour and have no protrusions.

D. Where detectors are installed on wood or masonry surfaces, attach brackets directly to the surface with tamperproof fasteners. Where detectors are installed on suspended ceilings, provide additional supports in the ceiling, such as channel support system, angle iron or additional runner bars. Fasten the additional supports rigidly to the ceiling runner bar system. Attach bracket to the supports with tamperproof fasteners. Install metal spacers between the bracket and supports so that the ceiling tiles will not be a part of the support system.

E. Where ceiling mounted type devices are called for, verify ceiling type and mounting height in the field. Provide pendant-mounted devices as required for specified mounting height.

F. Install manual pull station in normal path of egress within 60 inches of exit doorway.

G. Smoke- and Heat-Detector Spacing:
1. Provide detectors as indicated on the plans and complying with the below.
2. Smooth ceiling spacing of smoke detectors must not exceed 30 ft.
3. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
4. Lighting Fixtures: Locate detectors not closer than 12 inches from lighting fixtures and not directly above pendant mounted or indirect lighting.

H. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend full width of duct. Tubes more than 36 inch long must be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

**3.02 SYSTEM CIRCUITING**

A. All wiring shall conform to the NEC and to NFPA-72, National Fire Alarm Code.

B. Install all wiring in accordance with manufacturer's recommendations, taking into account loading, intended location, circuit length, spare capacity and voltage drop.

C. All wiring shall be copper and installed in a dedicated/segregated EMT conduit system.

D. Ground equipment in accordance with Grounding and Bonding specification.

E. Exposed raceway systems, system junction boxes, and surface mounted device boxes must be painted red.

F. Provide minimum #18 AWG twisted shielded pair for addressable signal line circuits. Notification appliance circuits shall be#14AWG minimum. Conductor size shall meet or exceed the manufacturer recommendation and be within the voltage drop calculations.

G. Addressable signal line circuits shall be NFPA 72 - 2016 Class A (redundant, single open operation).

H. Notification appliance circuits shall be NFPA 72 - 2016 Class A (redundant, single open operation).

I. Power circuits:
   1. Provide the required quantity of 20 ampere, 120 volt circuits to the system with a minimum of one (1) for the FACP, one (1) for each notification circuit extender.
   2. Circuit breakers serving fire alarm system equipment shall have a red handle lock to prevent from manual off operation. Directory shall be marked for the specific equipment served.

J. Notification circuits shall be segregated as indicated on the drawings and by individual floors as a minimum.

**3.03 ELECTRICAL AND CONTROL CONNECTIONS**

A. All installations shall be accomplished in a professional manner by qualified personnel regularly engaged in and experienced in this type of Work. Fire alarm installation shall be directed by a person who possesses a state license for installation of fire alarm systems. All equipment and components shall be installed in accordance with the manufacturer's recommendations.

B. Provide all wiring to sprinkler flow switches, pressure switches, temperature sensors and alarm check valves, installed by others. Review other trades drawings for quantities and locations. Maintain supervisory circuitry to the switches. Use liquidtight conduit for the last 2 ft. - 0 in. of raceway at the switch.

C. Provide all wiring to post indicator valves, OS&Y valves and dry pipe sprinkler system maintenance air pressure switches, provided by others. Wire into the supervisory alarm portion of the fire alarm system.

D. Provide all power supplies and wiring to smoke relief hatches provided by others. Smoke relief hatch shall operate only when its associated smoke detector is in alarm.

E. Coordinate locations of duct smoke detectors with the ductwork contractor. Provide all wiring to duct smoke detectors. Duct smoke detectors shall be mounted on the ventilating ductwork by others. All mounting arrangements, holes cut into ductwork, sealing of openings along with ceiling and access doors for the duct type detectors shall be provided by others. Provide duct detectors along with sampling tubes with end caps.

F. Provide all wiring required for fan shutdown. Wire from the addressable control module for each fan to be shut down and provide wiring from the module to the fan control unit (starter, adjustable speed drive, etc.) Dry contact shall be wired ahead of all control functions for starters. Provide intermediate relay for control circuits beyond the rating of the control module.

G. An auxiliary fire alarm relay used to control an emergency control device that provides control functions described in this specification shall be located within 3 ft. of the emergency control device and all wiring shall be supervised.

H. All smoke detectors shall be field checked and set to meet the prevailing conditions of the premise. All such Work shall be performed by an authorized representative of the manufacturer trained in such procedures. Spot type smoke detectors shall be mounted a minimum of 3' away from air diffusers and grilles.

I. Provide circuiting from all indicated motor controls for indication if not operational and close any associated smoke dampers.

J. Provide a weather proof combination horn/strobe unit to indicate fire protection system water flow located near the fire department connection at a location coordinated with the local Fire Marshall.

**3.04 IDENTIFICATION**

A. Identify system components, wiring, cabling, and terminals.

B. Install framed instructions in location visible from FACP.

**3.05 FIELD QUALITY CONTROL**

A. Field tests must be witnessed by the authority having jurisdiction.

B. Tests and Inspections:
   1. Engage factory-authorized service representative to administer and perform tests and inspections on components, assemblies, and equipment installations, including connections.
   2. Visual Inspection: Conduct visual inspection of all equipment and components prior to testing.
   3. System Testing:
      a. All system equipment, panels, components and functions shall be fully tested to meet NFPA 72, manufacturer's recommendations and ensure proper operation.
      b. Each initiation device shall be tested with manufacturer recommended initiating method to verify FACP annunciation.
      c. Each notification appliance shall be tested for alarm operation and proper audible/visual output.
      d. All ancillary initiation and control equipment shall be tested for proper operation.
      e. Provide test report once all equipment has proper operation as a submittal and once approved send copies to the Owner (O&M) and local fire marshal.

**3.06 TRAINING**

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, test, operate, and maintain fire-alarm system. Allow Owner to record training.

B. Provide a minimum of four (4) hours of instruction to the operating personnel designated by the Owner's Representative with regard to use and operation of the system.

**3.07 PROGRAMMING**

A. Include in bid the cost to cover all system programming, including items particular to this project (such as custom zone descriptions, time delay settings, sensitivity settings, etc.) such that entire system is 100% complete and operating to the Owner's satisfaction. Coordinate all system programming with the Owner. Provide up to three programming modifications.

B. Provide programming of the system a minimum of once during the warranty period to provide changes requested by the Owner.

**3.08 SPARE EQUIPMENT**

A. Provide the following spare equipment to the Owner. Deliver the equipment to the Owner designated location on the project site in original packaging.

B. Equipment to include:
   1. Smoke detectors: 5% of each type used with a minimum of five (5).
   2. Heat detectors: 5% of each type used with a minimum of five (5).
   3. Addressable control modules: 2% of each type used with a minimum of two (2).

**3.09 BUILDING RADIO SIGNAL SITE SURVEY**

A. The contractor shall have a third party entity perform a radio signal site survey to determine the fire department radio signal strength throughout the project area. This shall be conducted at

the end of construction and by a sub-contracted firm with methods acceptable to the local jurisdiction.

B. The survey shall be coordinated and in conjunction with the local fire department.

C. The survey shall meet the requirements of the Fire Code of New York State. Provide a report describing the survey methods used, pertinent requirements, measurements taken, areas where the signal strength is acceptable and recommendations for amplification/building antennas for areas where the signal strength is no suitable.

**END OF SECTION 28 31 02**

**SECTION 28 31 13**
**EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEM (ERCES)**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Section includes designing, furnishing, installing, and testing of a complete and operating Emergency Communications Enhancement Systems (ERCES (formerly known as Emergency Responder Radio Coverage System (ERRCS)). These specifications are provided to establish the scope and general operating characteristics of the system.

B. The function is to provide full building radio coverage of the local first responders including the Fire Department, Law Enforcement, Emergency Services, etc. at the signal strength required by the AHJ.

C. The ERCES system shall amplify Emergency Responder radio communications to provide 95% coverage in Common Areas and 99% floor area radio coverage In Critical areas per Building Code _____ of the State of _____.
   1. Critical areas include, but are not limited to, the following:
      a. Fire Command Center(s).
      b. Security room(s).
      c. Elevator(s).
      d. Elevator lobbie(s).
      e. Emergency and Stand-by Generator Room(s).
      f. Fire pump room(s).
      g. Area(s) of refuge.
      h. Inside enclosed exit stairway(s).
      i. Exit passageway(s).
      j. Standpipe cabinet(s).
      k. Sprinkler sectional valve location(s).
      l. Other staging areas identified by the Fire Department.

D. The ERCES shall provide monitoring of the essential system components as required by code to include not less than Antenna failure, Booster Failure, AC power supply failure, and system UPS failure.

E. Final acceptance and approval is required from the AHJ Department in writing prior to contract closeout.

### 1.02 SCOPE

A. The scope includes all jumpers and connecting cables for a complete and operational system.

B. The scope includes power outlets with branch circuitry as indicated on the drawings.

C. The scope includes all required cabling pathways above accessible ceilings and fixed conduit pathways in exposed areas

### 1.03 RELATED REQUIREMENTS

A. Section 00 43 27 - Separate Prices Breakout Form

B. 01 23 00 - Alternates

### 1.04 PRICE AND PAYMENT PROCEDURES

A. Allowances:
   1. See Section 01 21 00 - Allowances for allowances affecting this section.

### 1.05 ABBREVIATIONS AND ACRONYMS

A. AHJ - Authority Having Jurisdiction.

B. ERCES - Emergency Communications Enhancement Systems.

C. ERRCS - Emergency Responder Radio Coverage System.

## 1.06 REFERENCE STANDARDSICC (IBC)

A. BICSI 006 - Distributed Antenna System (DAS) Design and Implementation Best Practices; 2020.

B. BICSI N1 - Installation Practices for Telecommunications and ICT Cabling and Related Cabling Infrastructure, 1st Edition; 2019.

C. BICSI N3 - Planning and Installation Methods for the Bonding and Grounding of Telecommunication and ICT Systems and Infrastructure; 2020.

D. BICSI TDMM - Telecommunications Distribution Methods Manual, 14th Edition; 2020.

E. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NECA/BICSI 607 - Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings; 2011.

G. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.

H. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

## 1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Specify antenna grounding and surge protection in accordance with NEC Article 810.

C. Specify the backup power source (Life Safety), and include calculations to ensure the backup power requirements as specified in this standard are met.

D. Equipment Specification Sheets - Provide copies of manufacturer specification sheets of all system components

E. Shop Drawings:
   1. Include a plan view of each interior floor where indoor antenna systems are proposed. Include antenna numbers, coaxial cable routes, and the locations of any other system components including splitters, couplers, filters, amplifiers, etc. All components shall be named or labeled for reference in power budget calculations tables. Overlay approximated coverage radii indicating a –95 dBm downlink (base to mobile) signal strength around each proposed indoor coverage antenna. Include results of any previous coverage testing per grid, if available.
   2. Provide schematic diagram of each system including references to submitted equipment.

F. Certificate: Certify that products of this section meet or exceed specified requirements.
   1. Submit product certificates signed by the manufacturer of radio system components certifying that their products comply with specified requirements.

G. Delegated Design Documents: Drawings and calculations sealed by Designer.

## 1.08 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

D. Single-Source Responsibility: Obtain radio system components from a single source who assumes responsibility for compatibility of system components.

E. Installation shall conform to the requirements of the NFPA 101, Life Safety Code, the _____ State Basic Building Code, and Local Code and Building Authority requirements.

F. Comply with NFPA 72, State of _____ and all local codes.

G. All equipment shall be UL listed and labeled, and in accordance with applicable NEMA and ANSI Standards.

**1.09 GENERAL PERFORMANCE REQUIREMENTS**

A. Radio Information - The Contractor will be responsible to contact he Local Fire Department and AHJ to obtain City / County / Municipal System requirements.

B. The system as installed must comply with all applicable sections of FCC Rules Part 22, Part 90 and Part 101.

C. Signal Strength
   1. Downlink. A minimum signal strength of -95 dBm shall be provided throughout the coverage area.
   2. Uplink. A minimum signal strength of -100 dBm received at the City/County/Municipal Radio System from the coverage area.

D. Supported Frequencies: The radio system shall support simultaneous usage of analog and digital frequencies in the Megahertz public safety bands as utilized by the local Emergency Responder Radio Coverage System.

E. Reject filters: Notch filter sections shall be incorporated to minimize adjacent channel cellular and SMR (Nextel) degradation of the signal booster performance. The minimum downlink band adjacent band rejection shall be 35 dB or greater at system coverage bands/channels.

F. Band Migration Capability: The signal booster shall include re-tunable or replaceable filters to accommodate rapid and economic passband changes in the event of mandatory FCC changes within the NPSPAC band. The use of non-adjustable and non-replaceable RF input and output filters is prohibited.

G. Output Level control: An automatic output leveling circuit shall be included for both passbands with a minimum dynamic range of 60 dB, less any gain reduction setting, to maintain FCC out of band and spurious emission compliance.

H. Degraded performance in emergencies: The system shall be designed to allow degraded performance in adverse conditions, such as abnormally high temperatures resulting from nearby fires, extreme voltage fluctuations or other abnormal conditions that may occur during an emergency. Circuits that intentionally disable the signal booster in such situations (i.e. under/over voltage, over/under current, over/under temperature, etc.) shall not be implemented as the standard mode for public safety applications. It is the purpose of this specification to assure the maximum possible level of communications to public safety personnel depending upon the signal booster even to the extent of damaging the signal booster as long as some communications benefit can be provided during the emergency.

I. Mode of Operation: The system shall be normally powered on and shall continuously provide passing of frequencies within the Public Safety and First Responder bands.

J. Active Equipment (Signal Boosters and Bidirectional Amplifiers) Shall meet FCC Requirements.

**1.10 LICENSING**

A. All fees associated with the licensing shall be paid by the Contractor.

B. All testing must be done on frequencies authorized by the FCC. A valid FCC license will be required if testing is done on frequencies different from the police, fire or emergency medical frequencies.

C. Install systems in accordance with UL, NEC and all other applicable codes. Install system to comply with drawings and final shop drawings in compliance with manufacturer instructions. Provide all required hardware and labor for rack mounting of head-end system components.

## 1.11 APPROVAL AND TESTING PROCEDURES

A. Design Approval: Plans shall be submitted and approved prior to installation. The following information shall be provided to the local Fire Department unit representative by the system designer / Contractor:
   1. A minimum of 3 copies of the RF site survey results and of the proposed solution.
   2. A minimum of 3 copies of detailed drawings showing the location of the donor antenna with elevation information, amplification equipment and associated antenna systems which includes a view showing building access to the equipment.
   3. A minimum of 3 copies of schematic drawings of the electrical system, backup power, antenna system and any other associated equipment relative to the amplification equipment including panel locations and labeling.
   4. A minimum of 1 copy of the Manufacturer's data sheets on all equipment to be installed.

B. The local Fire Department will review plans and specifications. Upon acceptance, plans will be stamped to indicate approval. Stamped plans are required to be present at the acceptance test. Any field changes that occur during construction shall be incorporated into new As-Built plans, including any manufacturer's data sheets for any equipment changes not submitted in the original submittal. As-Built plans, if required due to system changes, shall be submitted to the local Fire Department for approval.

## 1.12 PROVISIONS FOR MAINTENANCE AND ANNUAL TESTING

A. Annual tests will be conducted by the local Fire Department unit or authorized company.
   1. The 1st year re-testing will be done at no expense to the Owner or the appropriate emergency services departments as required in the original testing procedures.

B. Maintenance Contract: Provide pricing for maintenance and sevice contract, not included in the base bid.

## 1.13 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Provide a one (1) year contractors full warranty and complete Service/Maintenance program in compliance with code required system maintenance/service of the system, including equipment, and wiring against defects in material and workmanship from the date of system completion and final acceptance. If any defects in materials, workmanship or operational failures are experienced within the warranty period promptly correct at no extra cost to the Owner for parts or labor. Provide statement of warranty with O & M manuals.

C. Contractor shall be responsible to provide service during normal working hours within (8) hours after notification by the Owner for normal service or within (2) hours for emergency service. Emergency service is defined as the loss of any system component inhibiting access to an entire building.

D. Within the warranty period, if equipment cannot be repaired with 24 hours of service visit, the Contractor shall provide "loaner" equipment to the Owner at no charge.

E. Proper identification is required and must be visible while on-site for warranty/service calls. Provide notification of completion to the Owner prior to departing the site.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. Berk-Tel Communications; www.gainbars.com

B. Cell Signal Solutions; www.cellsignalsolutions.com

C. Substitutions: See Section 01 60 00 - Product Requirements.

## PART 3 EXECUTION

### 3.01 TESTING

A. Pre-testing: The radio system shall be pre-tested to ensure that two-way coverage on each floor of the building meets the minimum coverage described above.

B. Testing Procedures
   1. Measurements shall be made with the antenna held in a vertical position at 3 to 4 feet above the floor to simulate a typical portable radio worn on the belt or turnout coat pocket.

C. All signal measurement acceptance testing shall be performed by the contractor with their own equipment, by qualified personnel who have specific training and familiarization with the test equipment, and with test equipment which have been calibrated within the previous 3 months. Signal measurement results shall be stored electronically and presented with final system documentation including information pertaining to the location of each of the signal measurement tests.

D. All signal quality and performance acceptance testing shall be performed with local Fire Department radios. Coordinate with the local Fire Department to acquire a test set (properly tuned and calibrated) for use during the acceptance testing.

E. Tests shall be made using frequencies close to the frequencies used by the Fire Department and appropriate emergency services. If testing is done on the actual frequencies, then this testing must be coordinated with the local Fire Department unit. All testing must be done on frequencies authorized by the FCC. A valid FCC license will be required if testing is done on frequencies different from the police, fire or emergency medical frequencies.

**END OF SECTION 28 31 13**

## SECTION 31 05 19
## GEOSYNTHETICS FOR EARTHWORK

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Geotextile for protection.

B. Geogrid for reinforcement.

C. Geocomposite for drainage.

D. Geomembrane for barrier.

### 1.02 RELATED REQUIREMENTS

A. Section 31 10 00 - Site Clearing.

B. Section 31 23 16 - Excavation.

C. Section 31 23 23 - Fill.

### 1.03 REFERENCE STANDARDS

A. AASHTO M 288 - Standard Specification for Geosynthetic Specification for Highway Applications; 2022.

B. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.

C. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).

D. ASTM D4716/D4716M - Standard Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head; 2022.

E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.

F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).

G. ASTM D5199 - Standard Test Method for Measuring the Nominal Thickness of Geosynthetics; 2012 (Reapproved 2019).

H. ASTM D6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile- Related Products Using a 50-mm Probe; 2014.

I. ASTM D6637/D6637M - Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method; 2015.

J. ASTM D7005/D7005M - Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites; 2016.

K. ASTM D7737/D7737M - Standard Test Method for Individual Geogrid Junction Strength; 2015.

L. GRI GM13 - Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes; 2021.

M. GRI GM32 - Geomembrane Seaming Using Data Acquisition Hot Wedge Welding Devices; 2019.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data on each product to be used, including physical properties, seaming materials, and installation instructions.

C. Manufacturer's Instructions: Indicate seaming method.

## 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 60 00 - Product Requirements for additional requirements.

B. Identify, store, and handle geosynthetic rolls and samples according to ASTM D4873/D4873M.

C. Protect materials from sunlight and other ultraviolet light sources during storage.

D. Handle geosynthetics with care and prevent dragging, dropping, or imbalanced lifting.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. SKAPS Industries: www.skaps.com/#sle.

B. Solmax: www.solmax.com/#sle.

C. US Fabrics Inc: www.usfabricsinc.com/#sle.

D. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 GEOSYNTHETIC

A. Provide geosynthetic in largest size sheets as possible to minimize field joining.

B. Uniform thickness according to ASTM D5199.

C. Ultraviolet Stability: 65 percent, minimum, when tested in accordance with ASTM D4355/D4355M.

## 2.03 GEOTEXTILE

A. General:
   1. Material: Polyethylene consisting of 5 percent maximum regrind and free of contaminants.
   2. AASHTO M 288.

B. Geotextile for Protection: Capable of absorbing and dissipating stress.
   1. Type: Woven.
   2. Seams: Mechanically sewn.
      a. Overlap: 3 inches (7.6 cm).
      b. Stitch: Flat; continuous; tied off at ends.
   3. Grab Strength: 500 lb (2.2 kN), minimum, when tested in accordance with ASTM D4632/D4632M.
   4. Puncture Strength: 650 lb (2.9 kN), minimum, when tested in accordance with ASTM D6241.

## 2.04 GEOGRID

A. General:
   1. Material: Polyethylene consisting of 5 percent maximum regrind and free of contaminants.
   2. Tensile Strength at 5 percent Strain: 800 lb/ft (11.7 kN/m), minimum, when tested in accordance with ASTM D6637/D6637M.
   3. Minimum Opening Size: 1/2 inch (12.7 mm).
   4. Products:
      a. Tensar, a division of CMC; InterAx: www.tensarcorp.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Geogrid for Reinforcement: Capable of increasing tensile strength of soils.
   1. Seams: Spliced.
      a. Overlap: 4 inches (10 cm).
      b. Splice: Fusion wedge welding.

2. Ultimate Tensile Strength: 4,000 lb/ft (58.4 kN/m), minimum, when tested in accordance with ASTM D6637/D6637M.
3. Junction Strength: 50 lb (0.22 kN), minimum, when tested in accordance with ASTM D7737/D7737M.

C. Geogrid Accessories:
1. Seaming Splices: Bodkin connection.
2. Anchoring Staples: As recommended by manufacturer.

## 2.05 GEOCOMPOSITE

A. Geocomposite for Drainage: Capable of collecting and transmitting liquids.
1. Material: Polyethylene consisting of 5 percent maximum regrind and free of contaminants.
2. Fabrication: Prefabricated.
3. Component Bond Strength: 0.5 lb/in (0.09 N/mm), minimum, when tested in accordance with ASTM D7005/D7005M.
4. Transmissivity: 5.0 gpm/ft (0.001 m3/s/m), minimum, when tested in accordance with ASTM D4716/D4716M.
5. Geonet Component: Faced on one side with geotextile.
   a. Thickness: 0.2 inch (5 mm) when tested in accordance with ASTM D5199.
   b. Side Seams: Cable tied.
      1) Overlap: 4 inches (10 cm).
   c. End Seams: Cable tied.
      1) Overlap: 12 inches (300 mm).
6. Geotextile Component: Attached to geonet.
   a. Type: Nonwoven.
   b. Seams: Mechanically sewn.
      1) Overlap: 12 inches (300 mm).
      2) Stitch: Flat; continuous; tied off at ends.
   c. Grab Strength: 200 lb (0.8 kN), minimum, when tested in accordance with ASTM D4632/D4632M.
   d. Elongation: 50 percent minimum, when tested in accordance with ASTM D4632/D4632M.
   e. Apparent Opening Size: No.70 (0.212 mm), maximum, when tested in accordance with ASTM D4751.
7. Products:
   a. Tensar, a division of CMC; FilterGrid: www.tensarcorp.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Geocomposite Accessories:
1. Seaming Splices: Plastic fasteners, contrasting color.
2. Anchoring Pins: As recommended by manufacturer.

## 2.06 GEOMEMBRANE

A. Geomembrane for Barrier: Capable of preventing fluid passage.
1. HDPE Liner: Plastic sheet, comply with GRI GM13.
   a. Thickness: 60 mils, 0.06 inch (1.5 mm).
   b. Sided: Single.
2. Seams: Thermal fusion.
   a. Overlap: 6 inches (150 mm), minimum.
   b. Thermally Fused Seams:
      1) Single hot wedge, according to GRI GM32.

B. Geomembrane Accessories:
1. Seaming Adhesive: As recommended by manufacturer and compatible with material being seamed.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Remove vegetation, boulders, and rocks larger than 3/4 inch (20 mm) in size and other sharp objects in accordance with Section 31 10 00.

B. Remove unsuitable materials in accordance with Section 31 23 16.

C. Fill in holes, including stake holes, backfill, and fill in accordance with Section 31 23 23.

### 3.02 INSTALLATION

A. General:
   1. Notify Architect a minimum of 24 hours prior to installation.
   2. Prevent surface drainage from eroding under geosynthetic. Repair undermined areas prior to backfill.
   3. Position geosynthetic smooth and wrinkle free on prepared surface; unroll or unfold carefully, avoiding stretching.
   4. Perform seaming in adequate lighting. Seam each geosynthetic member immediately after final placement. Clean sheets of dust, dirt, and other foreign matter prior to seaming.

B. Protection:
   1. Install geotextile according to manufacturer's recommendations.
   2. Lay sheets in the direction of incline.
   3. Repairs: Remove damaged portion of geotextile and seam an additional layer to cover the affected area in all directions.

C. Reinforcement:
   1. Install geogrid according to manufacturer's recommendations.
   2. Lay sheets in the direction of reinforcement.
   3. Allow geogrid to lie in a relaxed state for a minimum of 1/2 hour prior to attachments.
   4. Repairs: Remove damaged portion of geogrid and seam an additional layer to cover the affected area in all directions.

D. Drainage:
   1. Install geocomposite according to manufacturer's recommendations.
   2. Lay sheets in the direction of incline.
   3. Allow geocomposite to lie in a relaxed state for a minimum of 1/2 hour prior to attachments.
   4. Repairs:
      a. Remove damaged portion of geonet and end seam an additional layer to cover the affected area in all directions.
      b. Remove damaged portion of geotextile and seam an additional layer to cover the affected area in all directions.

E. Barrier:
   1. Install geomembrane according to manufacturer's recommendations.
   2. Lay sheets in the direction of incline.
   3. Allow geomembrane to lie in a relaxed state for a minimum of 1/2 hour prior to attachments.
   4. Repairs: Remove damaged portion of geomembrane and seam an additional layer to cover the affected area in all directions.

### 3.03 BACKFILL

A. Obtain approval for geosynthetic sheet installation from Architect before placing fill.

B. Backfill in a manner to prevent damage to geosynthetic. Repair geosynthetic damaged during backfill operations.

C. Cover geosynthetic in the installed direction in accordance with Section 31 23 23.
   1. Cover geosynthetic within time limits specified by manufacturer.

2. Drive only on earth cover and use only rubber-tired or rubber-tracked vehicles.
3. Lift Thickness: 12 inches (300 mm).

**3.04 PROTECTION**

A. Do not exceed geosynthetic manufacturer's recommended exposure to UV radiation.

B. Prevent surface water runoff from contaminating geosynthetic.

C. Do not use pins or staples where risk of damaging underlying geosynthetic layer is present.

D. Erect barricades to prevent traffic over geosynthetic before it is filled.

**END OF SECTION 31 05 19**

**SECTION 31 10 00**
**SITE CLEARING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Clearing and grubbing.

B. Selective removal and trimming.

C. Earth stripping and stockpiling.

D. Repair and restoration.

E. Debris removal.

### 1.02 REFERENCE STANDARDS

A. 29 CFR 1910.266 - Logging Operations; Current Edition.

B. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.

C. ANSI Z133 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Sedimentation Barrier: See Section 01 57 13 - Temporary Erosion and Sediment Control.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Comply with additional requirements specified in Section 01 70 00 - Execution and Closeout Requirements.

B. Identify potential runoff areas.

C. Construction Fencing: See Section 01 50 00 - Temporary Facilities and Controls.

D. Identify potential dust sources.

E. Identify preexisting debris, junk, and trash on-site.

### 3.02 PREPARATION

A. Coordinate work with utility companies; notify before starting work and comply with local requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are to remain.

E. Install sedimentation barrier according to Section 01 57 13 - Temporary Erosion and Sediment Control.

F. Develop dust remediation controls and methods. Do not use water if that results in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. Remove preexisting debris, junk, and trash on-site.

### 3.03 CLEARING AND GRUBBING

A. Clearing: Cut trees, stumps, shrubs, downed timber, and other vegetation for removal within identified area as indicated on drawings according to 29 CFR 1910.266. Follow recommendations of ANSI Z133 and best local practices for species involved.

B. Do not remove or damage vegetation beyond limits indicated on drawings.

### 3.04 SELECTIVE REMOVAL AND TRIMMING

A. Selective Removal: Individual tree and shrub identified for removal as indicated on drawings according to 29 CFR 1910.266.

B. Selective Trimming: Individual limbs and branches cut back according to ANSI A300 Part 1 identified for removal as indicated on drawings. Follow recommendations of ANSI Z133 and best local practices for species involved.

### 3.05 EARTH STRIPPING AND STOCKPILING

A. Stripping:
   1. Remove topsoil within identified area as indicated on drawings.

B. Stockpiling:
   1. Place topsoil in identified areas as indicated on drawings:
      a. Pile depth not to exceed 8 feet (2.5 m).

### 3.06 REMOVED VEGETATION PROCESSING

A. Do not burn, bury, landfill, or leave on-site, except as indicated on drawings.

B. Trees: Sell if marketable.

### 3.07 REPAIR AND RESTORATION

A. Remaining Existing Facilities, Utilities, and Site Features: If damaged due to this work, repair or replace to original condition.

B. Vegetation: Replace damaged or destroyed vegetation identified to remain as indicated on drawings at no cost to Owner:
   1. Outside removal limits.

### 3.08 DEBRIS REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and windblown debris from public and private lands.

### 3.09 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.

C. Leave site clean and ready to receive work.

**END OF SECTION 31 10 00**

**SECTION 31 22 00**
**GRADING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Rough grading.

B. Fine grading.

### 1.02 RELATED REQUIREMENTS

A. Section 31 23 23 - Fill.

### 1.03 REFERENCE STANDARDS

A. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).

### 1.04 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Gravel: Excavated on-site.

1. Graded according to ASTM D2487 Group Symbol GW, GP, or SP.

B. Other Fill Materials: See Section 31 23 23.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify survey bench mark and intended elevations for grading areas are as indicated.

B. Verify the absence of standing or ponding water.

### 3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect above- and below-grade utilities to remain.

D. Provide temporary means and methods to remove standing or ponding water from areas prior to grading.

E. Protect site features to remain, including but not limited to bench marks, survey control points, and fences.

### 3.03 ROUGH GRADING

A. Excavate and fill subgrade material to elevations indicated on plans.

B. Remove and replace unsuitable materials as specified fill.

### 3.04 FINE GRADING

A. Scrape and spread subgrade material uniformly smooth and without disruptions as indicated on drawings.

B. Slopes: Transition smoothly to adjacent areas.

### 3.05 TOLERANCES

A. Top Surface: Plus or minus 1 inch (____ mm).

### 3.06 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.

C. Leave site clean and raked, ready to receive work.

**END OF SECTION 31 22 00**

**SECTION 31 23 16**
**EXCAVATION**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Excavating for building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.

B. Trenching for utilities outside the building to utility main connections.

C. Temporary excavation support and protection systems.

### 1.02 RELATED REQUIREMENTS

A. Section 21 05 53 - Identification for Fire Suppression Piping and Equipment: Underground warning tapes at underground fire suppression lines.

B. Section 22 05 53 - Identification for Plumbing Piping and Equipment: Underground warning tapes at underground plumbing lines.

C. Section 23 05 53 - Identification for HVAC Piping and Equipment: Underground warning tapes at underground HVAC lines.

D. Section 26 05 53 - Identification for Electrical Systems: Underground warning tapes at underground electrical lines.

E. Section 31 22 00 - Grading: Grading.

### 1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Temporary Support and Excavation Protection Plan.

C. Field Quality Control Submittals: Document visual inspection of load-bearing excavated surfaces.

### 1.05 QUALITY ASSURANCE

A. Temporary Support and Excavation Protection Plan:
   1. Bracing and shoring design to meet requirements of OSHA's Excavation Standard, 29 CFR 1926, Subpart P.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Underground Warning Tapes:

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the work are as indicated.

B. Determine the prevailing groundwater level prior to excavation. If the proposed excavation extends less than 1 foot (305 mm) into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by Architect. If the proposed excavation extends more than 1 foot (305 mm) into the prevailing groundwater, control groundwater intrusion with a comprehensive dewatering procedures, or as directed by Geotechnical Engineer.

### 3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

C. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Architect.

### 3.03 TEMPORARY EXCAVATION SUPPORT AND PROTECTION

A. Excavation Safety: Comply with OSHA's Excavation Standard, 29 CFR 1926, Subpart P.
   1. Excavations in stable rock or in less than 5 feet (1.5 m) in depth in ground judged as having no cave-in potential do not require excavation support and protection systems.
   2. Depending upon excavation depth, time that excavation is open, soil classification, configuration and slope of excavation sidewalls, design and provide an excavation support and protection system that meets the requirements of 29 CFR 1926, Subpart P:
      a. Sloping and benching systems.
      b. Support systems, shield systems, and other protective systems.

### 3.04 EXCAVATING

A. Excavate to accommodate new structures and construction operations.

B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Provide temporary means and methods, as required, to remove all water from excavations until directed by Architect. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

### 3.05 FILLING AND BACKFILLING

A. Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation.

B. Install underground warning tape at buried utilities according to Sections 21 05 53, 22 05 53, 23 05 53, and 26 05 53.

### 3.06 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces by Architect before placement of foundations.

### 3.07 CLEANING

A. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 22 00.

B. Remove excavated material that is unsuitable for re-use from site.

C. Remove excess excavated material from site.

### 3.08 PROTECTION

A. Divert surface flow from rains or water discharges from the excavation.

B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.

D. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

E. Keep excavations free of standing water and completely free of water during concrete placement.

**END OF SECTION 31 23 16**

**SECTION 31 23 16.13**
**TRENCHING**

## PART 3 EXECUTION

### 1.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

### 1.02 TRENCHING

A. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Slope banks of excavations deeper than 4 feet (1.2 meters) to angle of repose or less until shored.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Cut trenches wide enough to allow inspection of installed utilities.

E. Hand trim excavations. Remove loose matter.

F. Remove excavated material that is unsuitable for re-use from site.

G. Remove excess excavated material from site.

H. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

I. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot (305 mm) into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect.

### 1.03 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

### 1.04 BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 2 inches in 10 feet (50 mm in 3 m), unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

F. Correct areas that are over-excavated.
   1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

G. Compaction Density Unless Otherwise Specified or Indicated:

H. Reshape and re-compact fills subjected to vehicular traffic.

### 1.05 BEDDING AND FILL AT SPECIFIC LOCATIONS

### 1.06 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.

B. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D1557 ("modified Proctor"), AASHTO T 180, or ASTM D698 ("standard

Proctor").

C. If tests indicate work does not meet specified requirements, remove work, replace and retest.

D. Frequency of Tests: _____.

**END OF SECTION 31 23 16.13**

**SECTION 31 23 16.26**
**ROCK REMOVAL**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Removal of identified rock during excavation.

### 1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 01 22 00 - Unit Prices, for additional unit price requirements.

B. Site Rock Removal: By the cubic yard (cubic meter) measured before disintegration. Includes preparation of rock for removal, explosive and mechanical disintegration of rock, removal from position, loading and removing from site. For over excavation, payment will not be made for over excavated work nor for replacement materials.

C. Trench Rock Removal: By the cubic yard (cubic meter) measured before disintegration. Includes preparation of rock for removal, explosive and mechanical disintegration of rock, removal from position, loading and removing from site. For over excavation, payment will not be made for over excavated work nor for replacement materials.

### 1.03 DEFINITIONS

A. Site Rock: Solid mineral material with a volume in excess of 1 cubic yard (0.76 cubic meter) or solid material that cannot be removed with a 2 cubic yards (1.14 cubic meters) capacity power shovel without drilling.

B. Trench Rock: Solid mineral material with a volume in excess of 1 cubic yard (0.76 cubic meter) or solid material that cannot be removed with a 1 cubic yard (0.76 cubic meter) capacity power shovel without drilling.

### 1.04 REFERENCE STANDARDS

A. NFPA 495 - Explosive Materials Code; 2023.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate the proposed method of blasting, delay pattern, explosive types, type of blasting mat or cover, and intended rock removal method.

### 1.06 QUALITY ASSURANCE

A. Seismic Survey Firm: Company specializing in seismic surveys with five years documented experience.

B. Explosives Firm: Company specializing in explosives for disintegration of rock, with five years documented experience.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Explosives: Type recommended by explosive firm following seismic survey and required by authorities having jurisdiction.

B. Delay Device: Type recommended by explosives firm.

C. Blast Mat Materials: Type recommended by explosives firm.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify site conditions and note subsurface irregularities affecting work of this section.

### 3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

## 3.03 ROCK REMOVAL

A. Excavate and remove rock by either mechanical or explosive methods.

B. Mechanical Methods: Drill holes and utilize expansive tools to fracture rock.

C. If rock is uncovered requiring the explosives method for rock disintegration, execute as follows:
   1. Provide seismographic monitoring during progress of blasting operations.
   2. Drill blasting holes within 12 feet (4 m) of finished slope.
   3. Disintegrate rock and remove from excavation.

D. Use of Explosives: Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.
   1. Comply with NFPA 495 and applicable state and local codes.
   2. Prior to blasting, obtain a seismographic survey to determine maximum charges that can be used at each location in area of excavation without damaging adjacent properties or other work.
   3. Prior to executing seismographic survey, advise owners of adjacent buildings and structures in writing; explain planned survey and blasting operations.
   4. Prior to blasting, document conditions of buildings near locations of intended blasting and photograph existing conditions identifying existing irregularities.
   5. Schedule work to avoid working hours of occupied buildings nearby.

E. Form level bearing at bottom of excavations.

F. Remove shaled layers to provide sound and unshattered base for footings.

G. In utility trenches, excavate to 6 inches (150 mm) below invert elevation of pipe and 24 inches (600 mm) wider than pipe diameter.

H. Remove excavated materials from site.

I. Correct unauthorized rock removal in accordance with backfilling and compacting requirements of Section 31 23 23.

## 3.04 FIELD QUALITY CONTROL

A. Independent agency field inspection will be provided under provisions of Section 01 40 00 - Quality Requirements.

**END OF SECTION 31 23 16.26**

**SECTION 31 23 23**
**FILL**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade, footings, slabs-on-grade, paving, and utilities within the building.

B. Backfilling and compacting for utilities outside the building to utility main connections.

### 1.02 RELATED REQUIREMENTS

A. Section 31 05 19 - Geosynthetics for Earthwork.

B. Section 32 91 19 - Landscape Grading.

### 1.03 DEFINITIONS

### 1.04 REFERENCE STANDARDS

A. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; 2022, with Errata .

B. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2019.

C. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012 (Reapproved 2021).

D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

E. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Soil Samples: 10 pounds (4.5 kg) sample of each type of fill; submit in air-tight containers to testing laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.

E. Compaction Density Test Reports.

## PART 2 PRODUCTS

### 2.01 FILL MATERIALS

A. General Fill - Fill Type General Fill: Subsoil excavated on-site.
   1. Graded.
   2. Suitable material from off-site borrow pits (run of bank) shall consist of a natural or artificial mixture hard, durable pebbles, rock fragments and soil binder, free from soft particles and excess clay, and shall be graded as follows:

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 4 inch | 100 |
| ¼ inch | 25 - 60 |
| No. 200 | 0 - 20 |

B. Structural Fill - Fill Type 1: Complying with State of New York Highway Department standard.

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 3/4 inch | 100 |
| 1/2 inch | 90 - 100 |

| | |
|---|---|
| 3/8 inch | 40 - 70 |
| No. 4 | 0 - 15 |
| No. 8 | 0 - 5 |

C. Granular Fill Crushed Stone or Pea Gravel - Fill Type 1a: Natural stone; washed, free of clay, shale, organic matter.
   1. Grade in accordance with ASTM D2487 Group Symbol GM.

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 3/4 inch | 100 |
| 1/2 inch | 90 - 100 |
| 3/8 inch | 40 - 70 |
| No. 4 | 0 - 15 |
| No. 8 | 0 - 5 |

D. Select Material No. 2 (crushed stone #2 - NYSDOT Table 703-4) shall conform to NYSDOT Section 703 - Aggregates, and shall be graded as follows:

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 1½ inch | 100 |
| 1 inch | 90 - 100 |
| ½ inch | 0 - 15 |

E. Select Material No. 4 (manufactured quarry processed stone) shall conform to the requirements of the NYSDOT Standard Specifications for NYSDOT Item No. 304.12, and shall be graded as follows:

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 2 inch | 100 |
| ¼ inch | 25 - 60 |
| No. 40 | 5 - 40 |
| No. 200 | 0 - 10 |

F. Select Material No. 5 (crushed stone #3A - NYSDOT Table 703-4) shall conform to NYSDOT Section 703-Aggregates, and shall be graded as follows:

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 2 inch | 100 |
| 1½ inch | 90 -100 |
| 1 inch | 0 - 15 |

G. Select Material No. 6 (crushed stone #3 - NYSDOT Table 703-4) shall conform to NYSDOT Section 703 - Aggregates, and shall be graded as follows:

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| 2½ inch | 100 |
| 2 inch | 90 - 100 |
| 1½ inch | 35 - 70 |
| 1 inch | 0 - 15 |

H. Sand - Fill Type 3: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Graded in accordance with ASTM C136/C136M; within the following limits:

| Sieve Size | Percent Passing (By Weight) |
|---|---|
| No. 4 | 90-100 |
| No. 8 | 75-100 |
| No. 16 | 50-85 |
| No. 30 | 25-60 |
| No. 50 | 10-30 |
| No. 100 | 1-10 |
| No. 200 | 0 - 3 |

## 2.02 ACCESSORIES

A. Geotextile: See Section 31 05 19.

## 2.03 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. Verify areas to be filled are not compromised with surface or ground water.

## 3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches (150 mm) to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

## 3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 2 inches in 10 feet (50 mm in 3 m), unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

F. Correct areas that are over-excavated.
   1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

G. Compaction Density Unless Otherwise Specified or Indicated:

H. Reshape and re-compact fills subjected to vehicular traffic.

I. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

## 3.04 FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Under Interior Slabs-On-Grade:
   1. Use Type1 or 1a .
   2. Compact to 95 percent of maximum dry density.

C. At Foundation Walls and Footings:
   1. Use ____.
   2. Do not backfill against unsupported foundation walls.

D. Over Subdrainage Piping at Foundation Perimeter and Under Slabs:
   1. Drainage fill and geotextile: Section 31 05 19.

2. Cover drainage fill with general fill.
3. Compact to 95 percent of maximum dry density.

E. Around and Over Underground Tanks:
1. Use initial fill of sand.
a. 12 inches (300 mm) deep.
b. Compact to 95 percent of maximum dry density.
2. Complete with general fill.
a. Compact to 95 percent of maximum dry density.

F. At Lawn Areas:
1. Use general fill.
2. Fill up to 6 inches (150 mm) below finish grade elevations.
3. Compact to 95 percent of maximum dry density.
4. See Section 32 91 19 for topsoil placement.

G. At Planting Areas Other Than Lawns :
1. Use general fill.
2. Fill up to 12 inches (300 mm) below finish grade elevations.
3. Compact to 95 percent of maximum dry density.
4. See Section 32 91 19 for topsoil placement.

H. At French Drains:
1. Use granular fill.
2. Compact to 95 percent of maximum dry density.

I. Under Pavers Set on Sand Leveling Bed:
1. Use granular fill.
2. Fill up to bottom of sand leveling bed.
3. Compact to 95 percent of maximum dry density.
4. See unit pavers section for leveling bed placement.

J. Under Monolithic Paving and Monolithic Paver Setting Beds:
1. Compact subsoil to 95 percent of its maximum dry density before placing fill.
2. Use general fill.
3. Compact to 95 percent of maximum dry density.
4. See Section 32 11 23 for aggregate base course placed over fill.

**3.05 TOLERANCES**

A. Top Surface of General Filling: Plus or minus 1 inch (25 mm) from required elevations.

**3.06 FIELD QUALITY CONTROL**

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.

B. Soil Fill Materials:
1. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180.
2. If tests indicate work does not meet specified requirements, remove work, replace and retest.
3. Frequency of Tests: as indicated on drawings.
4. Proof roll compacted fill at surfaces that will be under slabs-on-grade.

**END OF SECTION 31 23 23**

**SECTION 31 40 10**
**DEWATERING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for dewatering of excavations.

### 1.02 SYSTEM DESCRIPTION

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction to properly dewater, remove, and dispose of water entering into trenches and other excavations and to prevent saturated soil from flowing into the excavation.

B. The design and operation of the dewatering system shall maintain the stability of existing utilities, structures and pavements and prevent settlement of original ground, existing utilities, structures and pavements in the project area.

C. Unless otherwise shown on the drawings, the groundwater level shall be maintained at least two feet below the bottom of the excavation or controlled fill.

D. When jacking, boring, or tunneling operations are required, the contractor shall have available at all times adequate pumping equipment for dewatering shafts, jackings, borings, and tunnels. The contractor shall at all times use whatever means are required to control groundwater to prevent loss of ground. In addition, when placing the concrete cradle for the carrier pipe, the water in the jacking, boring or tunnel shall be controlled so that at no time during placement or hardening of the concrete will water wash, mix with, or seep into the unhardened concrete.

### 1.03 REFERENCES

A. New York Standards and Specifications for Erosion and Sediment Control.

### 1.04 SUBMITTALS

A. The contractor shall submit a comprehensive dewatering plan to the engineer for review including design and location of settlement basins, and plans for monitoring adjacent ground water, surface water, existing utilities and structures and water supplies to prevent loss or settlement.

B. Where dewatering is discharged into a storm drainage system, siltation levels shall be measured at each manhole or basin downstream of the discharge point both prior to dewatering and after termination. Levels shall be certified to by a licensed Land Surveyor.

### 1.05 SITE CONDITIONS

A. Where existing pipelines enter the construction area, they may be supported on permeable crushed stone material. This stone may act as a point source for large quantities of water at each such pipe location.

## PART 2 PRODUCTS

### 2.01 N/A

## PART 3 EXECUTION

### 3.01 PREPARATION

A. If shown on the drawings, water observation pipes shall be installed to monitor the ground water level during the dewatering operation. Daily observation of the ground water level in relation to bottom of the excavation shall be taken and recorded by the contractor under the observation of the engineer.

B. Power for dewatering equipment shall be electric utility power. Use of equipment which operates on gasoline or other such fuel will only be permitted if the availability of electric power is not feasible, or the equipment is used for standby power.

## 3.02 INSTALLATION

A. The water level obtained by dewatering shall be maintained at the specified depth below the excavation or controlled fill across the entire width of the excavation or controlled fill. Excavations shall be kept dry until the structures, pipes and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged and the placement and compaction of backfill material has taken place.

B. All water pumped or drained from the work shall be disposed of in a suitable manner without undue interference with other work or damage to surfaces and property. Suitable temporary channels shall be provided for water that may flow along or across the site of the work. No water shall be pumped or drained into work built or under construction. Water shall be disposed in such a manner as not to be a menace to Public Health.

C. Suitable provisions for adequate drainage of the discharge shall be made considering normal and flood conditions of both surface and ground water. Adequate stream flow in adjacent streams shall be maintained at all times.

D. Silt laden water or water contaminated by acid soils shall not be discharged directly into storm sewers, surface waters, stream crossings, wetlands or any critical impact area. Care shall be taken not to damage or fill vegetation by excessive watering or by silt accumulations in the discharge area. Settlement basins shall be employed where necessary to remove silt and to treat acid water to the ambient PH of the receiving waters.

E. To allow sediment to settle out of water that interferes with construction before such water enters any surface waters, dewatering operations shall direct pumpage as far from the critical impact area as possible and into suitable settlement basins. Settlement basins shall be constructed and used as specified to protect vegetation and to achieve environmental objectives.

F. All dewatering of excavations shall be done on the upland side of the excavation, away from the stream crossings, wetland habitats or critical impact areas, and the effluent shall be discharged through a manifold apparatus of no less than 50 feet in length with multiple discharge holes upland of an overlapped, anchored double hay bale barrier to prevent sediment discharge into the waterway, stream, wetland habitat or critical impact area or into suitable settlement basins.

G. All dewatering structures shall be maintained functional throughout their use period and siltation deposits in settlement basins, storm sewers, surface waters, streams or wetlands resulting from the dewatering operation shall be removed by the contractor periodically during construction and prior to the removal of the siltation control devices. Removed siltation deposits shall be disposed of in accordance with the Section "Waste Materials Disposal", Division 1. All areas shall be restored by the contractor to the condition existing prior to commencement of the dewatering operation.

H. Unless specified otherwise, if any water supplies such as wells are affected or disrupted by the dewatering operation, the contractor shall take whatever steps are required to provide uninterrupted water service at an average rate of 250 gallons per unit per day, including the installation of temporary water lines, if necessary. Prior to construction, the contractor shall ascertain the depth of existing water supply wells in the area which may be affected. Shallow wells whose depth is within the cone of influence of the dewatering operations shall be deepened prior to construction or other temporary measures taken.

I. In the event that excavations are to be carried below the elevations shown on the drawings, no work will proceed until the water level is lowered to a depth of at least two feet below the anticipated depth of the excavation.

J. In the event that the settlement basin, storm sewer, surface waters, streams or wetlands become surcharged or flooded, whether due to dewatering discharge or rainfall or a combination of both, the contractor shall throttle back or terminate his dewatering, until the adverse conditions subside.

K. Upon removal of well points, deep wells or other dewatering equipment, the contractor shall backfill, compact and pave (in roads) all holes. Holes shall be compacted for the full depth of the hole to a density equal to adjacent in place soils.

**3.03 FIELD QUALITY CONTROL**

A. If the potential for saline intrusion exists, water observation pipes shall be utilized and salinity tests shall be performed by the contractor on a weekly basis at observation pipes selected by the engineer. The contractor shall prevent saline intrusion by re-injection of dewatering discharge, minimizing pumping rates, or other methods.

B. When encountering acid soil conditions, the effluent pH from the settling basin shall be tested a minimum of two times daily and adjusted to ambient receiving water pH by the contractor.

C. Monitoring and testing of hydrogen sulfide content of dewatering discharge shall be the responsibility of the contractor. When hydrogen sulfide is present, means of oxidizing the hydrogen sulfide is present, means of oxidizing the hydrogen sulfide content of the discharge and, if required, neutralization of the acid shall be employed. The method of treatment shall be submitted to the engineer for review in accordance with provisions of the Section "Review of Contractor's Construction Procedure," Division 1.

**3.04 PROTECTION**

A. In the event that the bottom of the excavation is disturbed due to failure of the dewatering operation resulting in a loss of bearing capacity as determined by the engineer, the contractor shall assume full responsibility and bear the expense of all additional dewatering, excavating and backfilling required to correct the condition to the satisfaction of the engineer. To the end, the contractor shall provide all emergency generating equipment necessary to maintain dewatering operations during power outages.

**END OF SECTION 31 40 10**

## SECTION 32 12 16
## ASPHALT PAVING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Aggregate base course.

B. Double course bituminous concrete paving.

### 1.02 REFERENCE STANDARDS

A. AI MS-2 - Asphalt Mix Design Methods; 2015.

B. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.

### 1.03 QUALITY ASSURANCE

A. Perform Work in accordance with State of New York Highways standard.

B. Mixing Plant: Complying with State of New York Highways standard.

C. Obtain materials from same source throughout.

### PART 2 PRODUCTS

### 2.01 REGULATORY REQUIREMENTS

A. Comply with applicable code for paving work on public property.

### 2.02 MATERIALS

A. Asphalt Cement: ASTM D946.

B. Aggregate for Base Course - Fill Type Item 4: Angular crushed washed stone; free of shale, clay, friable material and debris.

### 2.03 ASPHALT PAVING MIXES AND MIX DESIGN

A. Asphalt Binder Course: State of New York Highways standards Type 3.

B. Asphalt Wearing Course: State of New York Highways standards Type 6Fx.

### 2.04 SOURCE QUALITY CONTROL

A. Test mix design and samples in accordance with AI MS-2.

### PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

### 3.02 AGGREGATE BASE COURSE

A. Place and compact aggregate base course.

### 3.03 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.

B. Place asphalt wearing course within two hours of placing and compacting binder course.

C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

### 3.04 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch (6 mm) measured with 10 foot (3 m) straight edge.

B. Variation from True Elevation: Within 1/2 inch (12 mm).

### 3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for quality control.

B. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.

**END OF SECTION 32 12 16**

## SECTION 32 13 13
## CONCRETE PAVING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Concrete sidewalks, integral curbs, and cast-in-place curbs.

#### 1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 32 17 26 - Tactile Warning Surfacing: Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

#### 1.03 REFERENCE STANDARDS

A. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.

B. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.

C. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.

D. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

G. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2023.

H. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.

#### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on joint filler, admixtures, and curing compound.

### PART 2 PRODUCTS

#### 2.01 FORM MATERIALS

A. Wood or metal form material, profiled to suit conditions.

#### 2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa) yield strength; deformed billet steel bars; unfinished.

B. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.

#### 2.03 CONCRETE MATERIALS

A. Concrete Materials: As specified in Section 03 30 00.

#### 2.04 ACCESSORIES

#### 2.05 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.

1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended by manufacturer.

D. Concrete Properties:
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; As scheduled.

**2.06 MIXING**

A. Transit Mixers: Comply with ASTM C94/C94M.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

**3.02 SUBBASE**

**3.03 PREPARATION**

A. Moisten base to minimize absorption of water from fresh concrete.

**3.04 FORMING**

A. Place and secure forms to correct location, dimension, profile, and gradient.

B. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

**3.05 REINFORCEMENT**

A. Place reinforcement as indicated.

B. Interrupt reinforcement at contraction joints.

**3.06 COLD AND HOT WEATHER CONCRETING**

A. Follow recommendations of ACI PRC-305 when concreting during hot weather.

B. Follow recommendations of ACI PRC-306 when concreting during cold weather.

C. Do not place concrete when base surface temperature is less than 40 degrees F (4 degrees C), or surface is wet or frozen.

**3.07 PLACING CONCRETE**

A. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

B. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

**3.08 JOINTS**

A. Align curb, gutter, and sidewalk joints.

B. Place 3/8 inch (10 mm) wide expansion joints at 20 foot (6 m) intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
   1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch (13 mm) of finished surface.
   2. Secure to resist movement by wet concrete.

C. Provide scored joints.
   1. At 4 feet (____ m) minimum intervals; unless noted otherwise.
   2. Between sidewalks and curbs.

**3.09 FINISHING**

A. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius ( 6 mm radius).

B. Curbs and Gutters: Light broom, texture parallel to pavement direction.

C. Inclined Vehicular Ramps: Broomed perpendicular to slope.

D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

### 3.10 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/4 inch (6 mm) in 10 ft (3 m).

### 3.11 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
   1. Provide free access to concrete operations at project site and cooperate with appointed firm.

B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd (76 cu m) or less of each class of concrete placed.
   1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

### 3.12 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

**END OF SECTION 32 13 13**

**SECTION 32 15 29**
**MONOLITHIC CONCRETE CURB AND SIDEWALK**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for installing monolithic concrete curbs and sidewalks.

### 1.02 SYSTEM DESCRIPTIONS

A. Monolithic curbs and sidewalk shall consist of Portland Cement concrete constructed on a thoroughly compacted subgrade and shall be of the strength and to the dimensions as shown on the drawings and/or as specified herein.

B. The width of the monolithic sidewalk and curb should be as shown on the drawings, but as a minimum, the monolithic sidewalk and curb shall be 4'6" in width from face of curb.

### 1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

### 1.04 QUALITY ASSURANCE

A. The finished monolithic curb and sidewalk shall be homogeneous, neat and workmanlike in appearance, installed at the proper elevations, un-wavy when looking down the curb line, and shall be of the required strength. All work with chips, spalling, scratches, or cracks (including hair line cracks) shall be removed and replaced at contractor's expense - NO EXCEPTION. All concrete not achieving the minimum required 28-day strength at 28-days, shall be removed and replaced at the contractor’s expense.

B. Completed monolithic curbs and sidewalks shall show no visible defects which require re-finishing.

C. Completed monolithic curbs and sidewalks shall not be subject to vehicular and/or pedestrian traffic until the work has gained sufficient strength to preclude damage.

D. Contractor shall ensure all exposed concrete surfaces are properly sealed to protect against de-icing agents. Any sidewalk shown to be scaling or spalling during warranty period shall be replaced at Contractor’s cost.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Preformed bituminous cellular type expansion joint fillers shall conform to the requirements of AASHTO M-213.

B. The concrete curing and sealing compound for monolithic curb and sidewalk shall be VEXCON CERTI-VEX GUARD CLEAR AIM as manufactured by VEXCON Chemicals Inc. Compound shall be delivered to site in un-opened manufactures containers to verify product.

C. Forms shall be metal, wood or other suitable material and shall be straight, free from warp, clean and oiled.

D. Detectable warning fields shall to be a cast in place system such as Armor Tile Tactile System, as manufactured by Armor Tile, or Step-Safe, as manufactured by TRANSPO Industries. Detectable warning fields shall be brick red in color, and shall be installed in accordance with manufactures specifications and guidelines.

## 2.02 MIXES

A. Concrete mix shall be an air-entrained Portland Cement having a minimum 28-day strength of 4000 psi. Concrete shall be reinforced with Stealth e3 micro- reinforcement as manufactured by SI Concrete Systems. Sidewalk shall also have 6 gauge 4”x 4” wire mesh flat panels installed at mid-depth.

# PART 3 EXECUTION

## 3.01 PREPARATION

A. The subgrade for the monolithic curb and sidewalk shall be compacted by suitable means to a density equal to that described in the Section "Soil Compaction", Division 2.

## 3.02 INSTALLATION

A. PRIOR TO SETTING OF FORMS, AND AFTER SETTING OF STRING LINES, THE CONTRACTOR , CONSTRUCTION OBSERVER AND/OR ENGINEER SHALL REVIEW THE STRING LINES TO ENSURE THAT THE PROPER GRADES ARE BEING ACHIEVED, AND THAT THE CURB LINE IS STRAIGHT AND UN-WAVY HORIZONTALLY AND VERTICALLY.

B. The concrete for monolithic curbs and sidewalks shall be tamped, screened and finished to grade and surface. The finish on the sidewalk shall be made with a wood float, followed by brushing transversely to the curb line with a wet soft brush to a near and workmanlike surface. The edges of the curb shall be rounded to the required radius with suitable edging tools.

C. A contraction joint, 1" deep and ¼" wide, shall be placed 10" back from the top face of curb, running parallel to the roadway.

D. In monolithic curbs and sidewalks, transverse expansion joints of the preformed cellulose type, 1/2" thick, shall be installed at intervals of 10' maximum spacing. Expansion material shall also be wrapped around the utility poles, with poles also being boxed out with expansion material 6” off the side of the pole.

E. In curbs, transverse expansion joints of the preformed cellulose type, 1/2" thick, shall be installed at any catch basin or other similar structure within the curb limits and behind such structure between sidewalk and structure.

F. In sidewalks, transverse contraction joints 1" deep and ¼" wide, shall be cut by means of a suitable tool between transverse expansion joints at 5' intervals.

G. In sidewalks, expansion joints of the preformed cellular type, 1/2" thick, shall be installed longitudinally between monolithic curb and sidewalk and any additional sidewalk; and longitudinally between sidewalks and permanent structures with the top ½" below the top of the sidewalk of which ½" void shall be filled with a joints sealer. Expansion material shall also be placed in line with all utility poles within the sidewalk.

H. Monolithic curbs and sidewalks shall be depressed and sloped at intersections to facilitate access by the handicapped as shown in the drawings.

I. Sidewalks sloped to facilitate access by the handicapped shall have grooves, ½" in depth placed parallel to the curb at 1½" intervals along ramped sections.

J. All driveway aprons and handicap ramps shall be 6" thick and shall be reinforced with fiber mesh. Detectable warning fields shall be placed all handicap ramps, and installed in accordance with manufacturers specifications and guidelines.

K. All sidewalk shall be 4" thick and shall be reinforced with fiber mesh and flat wire mesh panels.

L. Sidewalk joints shall be neatly rounded to a ¼" radius.

M. During the curing process, suitable signs warning workmen and the general public shall be erected and maintained by the Contractor, as well as means of bridging the newly installed monolithic curbs and sidewalks. Foot traffic shall be restricted for at least 24 hours.

### 3.03 FIELD QUALITY CONTROL

A. Concrete samples and testing shall be done as specified in Section 03300 "Cast-in- Place Concrete". Concrete shall not be poured unless a testing lab is on site. If concrete is poured without testing lab on site, it shall be removed and replaced at Contractor's expense.

**END OF SECTION 32 15 29**

**SECTION 32 16 23**
**SIDEWALKS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Concrete sidewalks.

B. Concrete wheelchair ramps.

### 1.02 RELATED REQUIREMENTS

A. Section 32 11 23 - Aggregate Base Courses.

B. Section 32 17 26 - Tactile Warning Surfacing.

### 1.03 REFERENCE STANDARDS

A. ACI 305R - Guide to Hot Weather Concreting; 2020.

B. ACI 306R - Guide to Cold Weather Concreting; 2016.

C. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.

F. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

G. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2019.

H. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Concrete: Provide data on admixtures.

### 1.05 FIELD CONDITIONS

A. Follow recommendations of ACI 305R and ACI 306R when concreting during hot and cold weather, respectively.

## PART 2 PRODUCTS

### 2.01 CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS

A. Gravel Subbase:  Thickness as indicated on drawings.

B. Concrete Forms:  wood or steel, contractors option.

C. Concrete Materials: Comply with ASTM C94/C94M.
   1. Concrete mix shall be an air entrained Portland cement having a minimum 28-day strength of 4,000 psi.

D. Aggregate: Pit Run, washed, 3/8 inch (1 cm) stone; free of shale, clay, friable material and debris.

E. Reinforcement:
   1. Steel Welded Wire Reinforcement: ASTM A1064/A1064M, plain type, flat sheets, unfinished.
      a. Sidewalk shall also have 6 gauge 4” x 4” wire mesh flat panels installed at mid-depth.  Wire mesh shall be placed on chairs to ensure location within slabs.
   2. Fiber Reinforcement: 1 percent, synthetic fibers, according to ASTM C1116/C1116M.

a. Concrete shall be fiber reinforced using Sika Fibermesh AC 100 as manufactured by Sika.

F. Joint Filler: Preformed expansion, with a thickness of 1/2 inch (13 mm).

G. Expansion joint sealer shall be Sikaflex – 2c NS EZ Mix. All Expansion joints shall be sealed.

H. Curing Compound: Synthetic, Type 1, Class A, according to ASTM C309.
1. The concrete curing and sealing compound for concrete sidewalks shall be CERTI-VEX GUARD CLEAR AIM as manufactured by ChemMasters. Curing and sealing compound shall be delivered to site in un-opened manufactures containers to verify product.

I. Surface Sealer: Topical, Type 1 , Class A, according to ASTM C1315.

J. Tactile Warning Surfaces: See Section 32 17 26.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify gradients and elevations of the subgrade are correct as shown on drawings. Where poor subgrade material is encountered, remove and replace with suitable material.

B. Verify compacted subgrade is acceptable, ready to support imposed loads and paving, and ready to receive work.

**3.02 SUBBASE PREPARATION**

A. Maintain subgrade in a smooth, compacted condition with required section and established grade until concrete is placed.

B. See Section 32 11 23 for aggregate subbase.

**3.03 CONCRETE SIDEWALK AND WHEELCHAIR RAMP INSTALLATION**

A. Forming:
1. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
2. Sidewalk Forms: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Height equal to the full depth of the finished sidewalk.
3. Wheelchair Ramps: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Comply with ADA Standards.

B. Reinforcement:
1. Place wire-mesh reinforcement mid-height of forms.
2. Uniformly add fiber reinforcement to concrete mix according to manufacturer's recommendations.

C. Placement:
1. Place concrete in a single lift.
2. Consolidate concrete by tamping and spading.

D. Joints:
1. Spacing: Provide scored joints every 5 feet ( 1.5 m).
2. Filler height equal to the full depth of the finished concrete.

E. Finishing:
1. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge, 1/4 inch radius (6 mm radius).
2. Wheelchair Ramps: Broomed perpendicular to slope.
3. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
4. Place surface sealer on exposed concrete surfaces after hardening. Apply in accordance with manufacturer's instructions.

**END OF SECTION 32 16 23**

**SECTION 32 17 23**
**PAVEMENT MARKINGS**

## PART 2 PRODUCTS

### 1.01 MANUFACTURERS

A. Painted Pavement Markings:
   1. Dunn-Edwards Corporation; Vin-L-Stripe Specialty Interior/Exterior Flat Zone Marking Paint.
   2. PPG Traffic Solutions; Ennis Flint Fast Dry Waterborne Traffic Paint, 9852x Series.
   3. Ozark Materials, LLC: www.ozarkmaterials.net
   4. Sherwin-Williams Company: www.sherwin-williams.com
   5. Substitutions: See Section 01 60 00 - Product Requirements.

### 1.02 PAINTED PAVEMENT MARKINGS

A. Comply with State of New York Highway Department standards.

B. Painted Pavement Markings: As indicated on drawings.
   1. Marking Paint: In accordance with AASHTO MP 24.
      a. Parking Lots: White.
      b. Symbols and Text: White.
      c. Wheelchair Symbols: Provide blue and white.

## PART 3 EXECUTION

### 2.01 EXAMINATION

A. Verification of Conditions: Verify that pavement is dry and ready for installation.

B. Notify Architect of unsatisfactory conditions before proceeding.

### 2.02 PREPARATION

A. Establish survey control points for locating and dimensioning of markings.

B. Place barricades, warning signs, and flags as necessary to alert approaching traffic.

C. Clean surfaces prior to installation.
   1. Remove dust, dirt, and other debris.

D. Apply paint stencils by type and color at necessary intervals.

### 2.03 INSTALLATION

A. General:
   1. Position pavement markings as indicated on drawings.
   2. Field location adjustments require approval of Architect.

B. Painted Pavement Markings:
   1. Apply in accordance with manufacturer's instructions.
   2. Apply in accordance with State of _____ Highway Department standards.
   3. Marking Paint: Apply uniformly, with sharp edges.
      a. Applications: One coat.
      b. Wet Film Thickness: 0.015 inch (0.4 mm), minimum.
      c. Stencils: Lay flat against pavement, align with striping, remove after application.
      d. Length Tolerance: Plus or minus 3 inches (75 mm).
      e. Width Tolerance: Plus or minus 1/8 inch (3 mm).

### 2.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. If inspections indicate work does not meet specified requirements, rework and reinspect at no cost to Owner.

C. Allow the pavement marking to set at least the minimum time recommended by manufacturer.

**2.05 PROTECTION**

A. Prevent approaching traffic from crossing newly applied pavement markings.

B. Replace damaged or removed markings at no additional cost to Owner.

C. Preserve survey control points until pavement marking acceptance.

**END OF SECTION 32 17 23**

## SECTION 32 17 26
## TACTILE WARNING SURFACING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Tactile warning surfacing for pedestrian walking surfaces.

### 1.02 RELATED REQUIREMENTS

A. Section 32 13 13 - Concrete Paving: Concrete sidewalks.

### 1.03 REFERENCE STANDARDS

A. AASHTO LRFD - Bridge Design Specifications; 2024.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.

D. ASTM C501 - Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser; 2021.

E. ASTM C903 - Standard Practice for Preparing Refractory Specimens by Cold Gunning; 2015 (Reapproved 2020).

F. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine; 2017.

G. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2021.

H. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.

I. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.

J. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2023.

K. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

M. ASTM G155 - Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials; 2021.

N. ATBCB PROWAG - Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; 2023.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's product data, standard details, details specific to this project; written installation and maintenance instructions.

C. Manufacturer's Qualification Statement.

D. Warranty: Submit manufacturer warranty; complete forms in Owner's name and register with manufacturer.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years documented experience.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver to project site in manufacturer's protective wrapping and in manufacturer's unopened packaging.

B. Store covered and elevated above grade and in manufacturer's unopened packaging until ready for installation. Maintain at ambient temperature between 40 and 90 degrees F (4 and 32 degrees C).

## 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Plastic Tiles: Provide manufacturer's standard five year warranty against manufacturing defects, breakage or deformation.

# PART 2 PRODUCTS

## 2.01 MANUFACTURERS

A. Plastic Tactile and Detectable Warning Surface Tiles:
   1. Access Tile, a brand of Access Products, Inc: www.accessproducts.com/#sle.
   2. ADA Solutions, a division of SureWerx USA: www.adatile.com/#sle.
   3. EqualTile, a brand of Advanced Roadway Manufacturing, Inc: www.equaltile.com/#sle.
   4. Armor-Tile, a brand of Engineered Plastics, Inc: www.armortiletransit.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 TACTILE AND DETECTABLE WARNING DEVICES

A. Plastic Tactile and Detectable Warning Tiles: Comply with ADA Standards, glass fiber and carbon fiber reinforced, exterior grade, matte finish polyester sheet with truncated dome pattern, solid color throughout, internal reinforcing of sheet and of truncated domes, integral radius cut lines on back face of tile; with factory-applied removable protective sheeting.
   1. Material Properties:
      a. Water Absorption: 0.20 percent, maximum, when tested in accordance with ASTM D570.
      b. Slip Resistance: 0.50 minimum dry static coefficient of friction, when tested in accordance with ASTM D2047.
      c. Compressive Strength: 25,000 pounds per square inch (172 MPa), minimum, when tested in accordance with ASTM D695.
      d. Tensile Strength: 10,000 pounds per square inch (69 MPa), minimum, when tested in accordance with ASTM D638.
      e. Flexural Strength: 25,000 pounds per square inch (172 MPa) minimum, when tested in accordance with ASTM D790.
      f. Chemical Stain Resistance: No reaction to 1 percent hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, or antifreeze, when tested in accordance with ASTM D543.
      g. Abrasion Resistance: 300, minimum, when tested in accordance with ASTM C501.
      h. Flame Spread Index: 25, maximum, when tested in accordance with ASTM E84.
      i. Accelerated Weathering: Delta-E of less than 5.0 at 2,000 hours exposure, when tested in accordance with ASTM G155.
      j. Adhesion: No delamination of tile prior to board failure in a temperature range of 20 to 180 degrees F (minus 7 to 82 degrees C), when tested in accordance with ASTM C903.
      k. Loading: No damage when tested according to AASHTO LRFD test method HS20.
      l. Salt and Spray Performance: No deterioration or other defect after 200 hours of exposure, when tested in accordance with ASTM B117.
   2. Installation Method: Cast in place.
   3. Shape: Rectangular.
   4. Dimensions: as indicated on drawings.
   5. Pattern: In-line pattern of truncated domes complying with ADA Standards.
   6. Color: As selected by Architect from manufacturer's standard range.

## PART 3 EXECUTION

### 3.01 INSTALLATION, GENERAL

A. Install in accordance with manufacturer's written instructions.
   1. Do not install damaged, warped, bowed, dented, abraded, or otherwise defective units.
   2. Do not install when ambient or substrate temperature has been below 40 degrees F (4 degrees C) during the preceding 8 daylight hours.

B. Field Adjustment:
   1. Locate relative to curb line in compliance with ATBCB PROWAG, Sections 304 and 305.
   2. Orient so dome pattern is aligned with the direction of ramp.

C. Install units fully seated to substrate, square to straight edges and flat to required slope.

### 3.02 INSTALLATION, CAST IN PLACE PLASTIC TILES

A. Tamp and vibrate units as recommended by manufacturer.

B. Place and position weights on units while concrete cures as recommended by manufacturer. Ensure no voids or air pockets exist between top surface of concrete and underside of units.

### 3.03 CLEANING PLASTIC UNITS

A. Remove protective plastic sheeting within 24 hours of installation.

B. Remove excess sealant or adhesive from joints and edges.

C. Clean four days prior to date of scheduled inspection.

### 3.04 PROTECTION

A. Protect installed units from traffic, subsequent construction operations or other imposed loads until concrete is fully cured.

B. Touch-up, repair or replace damaged products prior to Date of Substantial Completion.

**END OF SECTION 32 17 26**

## SECTION 32 31 13
## CHAIN LINK FENCES AND GATES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Posts, rails, and frames.

B. Wire fabric.

### 1.02 REFERENCE STANDARDS

A. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire; 2022.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

D. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2022).

E. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2023.

F. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.

G. CLFMI WLG 2445 - Wind Load Guide for the Selection of Line Post and Line Post Spacing; 2023.

H. FS RR-F-191/1D - Fencing, Wire and Post Metal (Chain-Link Fence Fabric); 1990.

### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.

### PART 2 PRODUCTS

### 2.01 CHAIN LINK FENCE AND GATE ELEMENTS

A. (32.3113.00) 6'-0" high chain link fence

B. (32.3113.01) 8'-0" high chain link fence

C. (32.3113.02) 4'-0" high chain link fence

D. (32.3113.10) 3'-0" wide chain link single gate

E. (32.3113.11) 4'-0" wide chain link single gate

F. (32.3113.12) 6'-0" wide chain link double gate

G. (32.3113.30) 2-3/8" (2.38 inch) diameter line post

H. (32.3113.31) 2-7/8" (2.88 inch) diameter terminal post

I. (32.3113.32) 2-7/8" (2.88 inch) diameter corner post

J. (32.3113.33) 3-1/2" (3.5 inch) diameter gate post

K. (32.3113.35) 1-5/8" (1.66 inch) brace rail

L. (32.3113.36) 1-5/8" (1.66 inch) bottom rail

M. (32.3113.37) 1-5/8" (1.66 inch) gate frame for welded connections

N. (32.3113.50) Fabric 2" diamond mesh, 9 ga interwoven wire.

O. (32.3113.50) Fabric with HDPE privacy slats,2" diamond mesh, 9 ga interwoven wire.

## 2.02 COMPONENTS

A. Line Posts: 2.38 inch (60 mm) diameter.

B. Corner and Terminal Posts: 2.88 inch (73 mm) diameter.

C. Gate Posts: 3-1/2 inch (89 mm) diameter.

D. Top and Brace Rail: 1.66 inch (42 mm) diameter, plain end, sleeve coupled.

E. Gate Frame: 1.66 inch (42 mm) diameter for welded fabrication.

F. Fabric: 2 inch (51 mm) diamond mesh interwoven wire, 9 gauge, 0.1483 inch (3.8 mm) thick, top selvage knuckle end closed, bottom selvage twisted tight.

## 2.03 MATERIALS

A. Posts, Rails, and Frames: _____:
   1. Line Posts: Type I round in accordance with FS RR-F-191/1D.
   2. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round in accordance with FS RR-F-191/1D.

B. Wire Fabric: _____:

## 2.04 COMPONENTS

A. Line Posts: 1.9 inch (48 mm) diameter.

B. Corner and Terminal Posts: 2.38 inch (60 mm) diameter.

C. Fabric: 2 inch (51 mm) diamond mesh interwoven wire, 6 gauge, 0.1920 inch (4.9 mm) thick, top selvage knuckle end closed, bottom selvage twisted tight.

**END OF SECTION 32 31 13**

## SECTION 32 91 19
## LANDSCAPE GRADING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Topsoil placement.

B. Finish grading.

#### 1.02 REFERENCE STANDARDS

A. ASTM D5268 - Standard Specification for Topsoil Used for Landscaping and Construction Purposes; 2023.

#### 1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

B. Field Quality Control Submittals: Topsoil depth measurements.

#### 1.04 FIELD CONDITIONS

A. Place topsoil during dry weather.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

A. Topsoil: Comply with ASTM D5268.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify grading and intended elevations are as indicated on drawings.

B. Verify absence of standing or ponding water.

#### 3.02 PREPARATION

A. Remove debris, roots, branches, stones, in excess of 1/2 inch (13 mm) in size.

B. Scarify surface to depth of 3 inches (75 mm).

#### 3.03 TOPSOIL PLACEMENT

A. Uniformly distribute and spread topsoil.

B. Place topsoil in areas where seeding, sodding, and planting as indicated on drawings.

C. Place topsoil to the following compacted thicknesses:
   1. Areas Indicated Seeded with Grass: 6 inches (150 mm).
   2. Shrub Beds: 18 inches (450 mm).
   3. Flower Beds: 12 inches (300 mm).

#### 3.04 FINISH GRADING

A. Maintain profiles and contour of subgrade.

B. Remove roots, weeds, rocks, and foreign material while spreading.

C. Maintain uniform topsoil thickness.

D. Lightly compact placed topsoil.

#### 3.05 PROTECTION

A. Protect from stormwater runoff and subsequent construction operations.

B. Do not permit traffic until established.

**END OF SECTION 32 91 19**

**SECTION 32 93 00**
**PLANTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. New trees, plants, and ground cover.

B. Relocated trees, plants, and ground cover.

### 1.02 RELATED REQUIREMENTS

A. Section 32 98 30 - Topsoil Material

### 1.03 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

B. Plants: Living trees, plants, and ground cover specified in this Section , and described in ANSI Z60.1.

### 1.04 SYSTEM DESCRIPTION

A. Planting of plant materials shall include furnishing of all labor, material, and equipment necessary and required to complete the work of planting as indicated on the drawings and as herein specified, including, but not necessarily limited to the following:
   1. Furnishing and spreading topsoil from on site or off-site sources.
   2. Excavation and preparation of tree and shrub pits.
   3. Furnishing and planting of trees, plants and ground covers.
   4. Staking and wrapping trees as required.
   5. Replacements and execution of maintenance work until the issuance of certificate of final acceptance.
   6. Repairs to property damaged by execution of the work under this section.

B. Sodding shall include the furnishing and placing of sod.

### 1.05 REFERENCE STANDARDS

A. ANSI/AHIA Z60.1 - American National Standard for Nursery Stock; 2014.

### 1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Certificate: Certify fertilizer and herbicide mixture approval by authority having jurisdiction.

C. Certificate: Submit certificate for plants free of disease or hazardous insects; certified by federal department of agriculture; free of disease or hazardous insects.

D. Maintenance Data: Include cutting and trimming method; types, application frequency, and recommended coverage of fertilizer.

E. Submit list of plant life sources.

F. Shop drawings shall conform with the provisions of the Section "Shop Drawings and Samples," Division 1

### 1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide one year warranty.

C. Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.

D. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

## PART 2 PRODUCTS

### 2.01 PLANTS

A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

B. Plant List

C. The Contractor shall have investigated the sources of supply and satisfied himself that he can supply all of the plants shown on the drawings in the size, variety, and quality noted and specified, before submitting his bid. Failure to take this precaution will not relieve the successful bidder from his responsibility as Contractor for furnishing and installing all of the plant material in strict accordance with the contract requirements and without additional expense to the Owner. Substitutions will not be permitted. If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of nearest equivalent size or variety with an equitable adjustment of contract price. Such proof shall be substantiated and submitted in writing to the Engineer.

D. Plant Selection

1. Plants shall be rejected upon delivery to the site or during the progress of the work, for size and condition of balls, diseases, insects, defects, or injuries. Rejected plants shall be removed immediately from the site.

E. Plant Quality and Size

1. All plants shall be nursery grown in accordance with good horticultural practice and shall have been grown under climatic conditions similar to those in New York State for at least two years. They shall have been transplanted or root pruned during growth. Trees shall have straight trunks with the leader intact and undamaged. Trunks shall have no unhealed scars.
2. Plants shall be typical of their species or variety and shall have normal habits of growth. They shall be sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free from disease or insect pests, and shall have healthy well developed root systems. All plant and ball sizes shall conform to standards set in the publication, "*American Standard for Nursery Stock*," as published by the American Association of Nurserymen.
3. All plants shall be measured with branches in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch or root tip to tip. The determining measurement for trees shall be the caliper, which shall be taken 6 inches above the ground.
4. All plants shall conform to the measurements specified except that plants larger than specified may be used if approved by the Engineer. Use of such plants shall not increase the contract price.
5. Plants shall not be pruned prior to delivery. Pruning is to be done only under the direction of the Engineer.

F. Digging and Handling

1. No plants shall be dug until the required inspections have been made and the plants approved by the City of Beacon.
2. Dig balled and bur lapped (BB) plants with firm, natural balls of earth, of diameter and sufficient depth to include the fibrous and feeding roots. No plants will be accepted if the ball is cracked or broken before or during planting operations.
3. All trees and shrubs shall be balled using only natural burlap and jute twine. Any plants delivered to the site having balls wrapped and tied with materials other than natural burlap and jute twine, will be rejected. The Contractor is advising to notify his suppliers of this requirement.

4. Roots or balls of all plants shall be adequately protected at all times from sun and/or drying winds. Balled and bur lapped plants that cannot be planted immediately upon delivery shall be set on the ground and well protected with soil, wet peat or other acceptable material. All plants shall be watered as necessary until planted.
5. No plant shall be bound with wire or rope at any time so as to damage the bark or break branches.

G. Topsoil
1. All topsoil required for the work shall be provided by the Contractor.
2. Topsoil shall be natural, fertile, friable soil of uniform character and shall be delivered in an unfrozen and non-muddy condition. It shall be obtained from naturally well drained areas and shall not contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil or excessive sand, shall be free of litter or debris, and shall be reasonably free from clay lumps, stones, sticks and roots. It shall be sufficiently fertile to sustain normal, healthy plant growth, shall have a pH value not higher than 7.0 nor lower than 6.0 and shall contain not less than 5% organic matter.
3. Representative samples of all topsoil brought in shall be furnished to the Engineer by the Contractor. The Engineer reserves the right to reject on or after delivery any material which does not meet specified standards.

H. Peat
1. Shall be reed sedge peat, low in content of weedy materials, and free of mineral matter harmful to plant life. Furnish air dried, finely shredded, of a pH between 4.5 and 6.5, containing no more than 35% moisture by weight.

I. Sand
1. Natural sand; clean, sharp and free from all deleterious material.

J. Planting Tablets
1. Planting tablets shall be 21-gram sizes 20-10-5 “Agriform” by Agriform International Chemicals, Inc., or approved equal.

K. Mulch
1. Shredded bark or decomposed wood chips; submit sample for approval.

L. Wrapping Materials
1. Krinkle Kraft tree wrapping paper.

M. Tree Wound Paint
1. Asphaltic base paint specially prepared for tree surgery work.

N. Twine
1. Twine shall be 2-ply jute twine.

O. Water
1. Contractor shall be responsible for supplying required water. All water used shal be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time.

## PART 3 EXECUTION

### 3.01 PREPARATION OF TREE PITS AND PLANTERS

A. Tree pits shall be as shown on the drawings and shall be excavated with vertical sides and flat, squared bottoms. No litter, stones, or materials other than the existing clean subsoil shall be in the tree pits when planting soil and trees are placed. If holes are dug deeper than shown on the drawings, only prepared planting soil as specified shall be planted in the tree pits to establish required grades. Remove all excavated materials from site and dispose of legally.

### 3.02 PLANTING SOIL

A. Shall be prepared by mixing topsoil, peat, sand and fertilizer so that the resultant soil is of the following consistency: 75% topsoil, 20% peat and 5% sand. Planting soil shall be mixed in a location which avoids staining of concrete. No mixing of planting soil shall be done if soil is in

wet or frozen condition.

### 3.03 PLACING OF PLANTING SOIL

A. Planting soil shall have a thickness after settlement as indicated on drawings. The Contractor shall maintain the finished surfaces at the required grades and shall deposit additional planting soil as may be required to correct all settlement up to the date of Final Acceptance.

### 3.04 PLANTING

A. All plants shall be centered and set on compacted planting soil to such depth that the finished grade level at the plant after settlement will be the same as that at which the plant was grown. Plants shall be planted upright and faced to give the best appearance or relationship to adjacent structures. No burlap or twine shall be removed from balls. Planting soil shall be placed and compacted carefully to avoid injury to roots and to fill all voids. When the hole is nearly filled, add water as necessary and allow it to soak away. Fill with planting soil to finished grade. After initial settlement, additional planting soil shall be filled in to maintain level of finished grade.

B. Insert (8) 21-gram size planting tablets in each tree pit in accordance with manufacturer's direction.

### 3.05 WRAPPING

A. Shall be done promptly after planting. Wrap spirally from the grow line to the height of the second branches. Wrapping shall be neat and snug and the material held in place with twine every two (2) feet.

### 3.06 PRUNING

A. Shall be done in accordance with standard horticultural practice to preserve the natural character of the plant. Only clean sharp tools shall be used. All cuts shall be covered with tree wound paint.

B. Mulching

C. Shall be done within 2 days of planting. All planting beds shall be covered with a four-inch layer of mulch.

### 3.07 INSPECTION, GUARANTEE AND MAINTENANCE

A. Inspection for Beginning of Guarantee Period.
   1. This inspection is considered separate and distinct from inspection acceptance and warranty of remainder of work under the Contract.
   2. Inspection of the work to determine its completion for beginning of the guarantee period will be made by the Engineer upon request for such inspection submitted by the Contractor at least ten (10) days prior to the anticipated date. <u>All planting must be alive and healthy to be considered complete.</u>
   3. After inspection the Contractor will be notified by the Engineer of the date of the beginning of the guarantee period, or if any deficiencies, of the requirements for beginning the guarantee period. Upon notification of beginning of the guarantee period the Contractor and thus the planting subcontractor will be paid 95% of the cost of the work. A 5% retainage on lump sum of planting work included in the contract will be retained during the warranty period.

B. Maintenance
   1. Contractor shall maintain tree during two (2) year guarantee period. Maintenance shall include, but not be limited to, pruning of trees, watering, and all else to maintain a healthy tree.
   2. Shall begin immediately after each plant is planted and continue to the termination of the guarantee period.
   3. Maintenance of new planting shall consist of pruning, re-fertilization, watering, resetting plants to proper grades or upright position, and furnishing and applying such sprays as are necessary to keep the plants free from insects and disease.

4. Re-fertilization is to be Ra-Pid-Gro or approved equal at the rate of one pound of fertilizer to 30 gallons on water per tree 3” caliper and larger; all smaller trees at the rate of one third pound of fertilizer to 10 gallons of water per tree applied every three weeks. Fertilizer is to be completely water soluble and containing not less than 23% nitrogen, 21% phosphorous, 17% potassium.
5. The root systems of al plants shall be watered at such intervals as will keep the surrounding soil in best condition for promotion of root growth and plant life.
6. Maintenance inspection will be held approximately 6 and 12 months after the beginning of the guarantee period. The Contractor shall accompany the Engineer on the inspection and shall perform all necessary maintenance work immediately thereafter.

C. Guarantee and Replacement.
1. All plants shall be guaranteed to be alive and healthy as determined by the Engineer at the end of the guarantee period.
2. Guarantee period shall extend for a period of two (2) years from the date of written notice.
3. The Contractor shall replace, in accordance with the drawings and specifications and throughout the guarantee period, any plants that die, or in the opinion of the Engineer, are in an unhealthy or unsightly condition, and/or have lost their natural shape due to dead branches, excessive pruning, inadequate or improper maintenance, or any other causes due to the Contractor's negligence. The Contractor shall not be held responsible for acts of vandalism occurring after the beginning of the guarantee period.

D. Final Inspection and Acceptance
1. nspection of the work to determine its final acceptance will be made by the Engineer at the conclusion of the guarantee period. No plants will be accepted unless they are alive and healthy and all related work conforms to the drawings and specifications.

**END OF SECTION 32 93 00**

## SECTION 33 01 10
## EXISTING UTILITIES AND STRUCTURES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for protecting, removing, relocating and replacing existing utilities and structures

### 1.02 SYSTEM DESCRIPTION

A. Protection of existing utilities and structures not designated for removal, relocation or replacement are supplemental to the requirements of the general conditions.
   1. The Contractor shall strictly comply with the requirements of the owners of existing utilities and structures including but not limited to those related to support, protection, inspection and testing.
   2. As the excavation approaches utilities or underground structures, digging by machinery shall be discontinued until manual excavation properly locates the extent of the utility or structure.

B. In the event of damage, injury or loss to existing utilities and structures, whether shown on the drawings or not, the Contractor shall make all reasonable efforts to facilitate repairs and to mitigate the impact of such events upon the utility or structure's owner's normal operations. The Contractor shall be responsible for restoring the existing utility or structure to the condition required by the owner of the utility or structure, or at least to a condition found immediately prior to the work. In the event that the utility owner elects to repair, the Contractor shall provide all reasonable access and assistance and will reimburse the utility owner for the cost of the repair. If utility service is interrupted, alternate facilities shall be provided.
   1. Backfilling around protected utilities and structures shall be in accordance with the Section "Trenching, Backfilling and Compaction," Division 2.

C. Re-routing of the work to avoid existing utilities and structures.
   1. Where existing utilities and structures appear to be located differently than shown on the drawings as indicated by the mark out described in the Section "Utilities - Notification and Markout," Division 1, test pits as described in the Section "Test Pits for Verification of Utilities and Structures," Division 2, or by field observation, the Contractor shall notify the Engineer so that the work may be re-routed, if possible, to avoid interferences. Re-routing to avoid interferences shall be treated as a Minor Change thereby not involving an adjustment in the contract price or contract time.

D. Removal, relocation or replacement of existing utilities and structures.
   1. Where shown on the drawings, the Contractor shall be responsible to remove, relocate or replace existing utilities and structures in accordance with the specific specifications section describing the item of work.
   2. If removal, relocation or replacement of existing utilities and structures are required because of interference with the work, or by request of the utility owner, the change shall be in accordance with General Conditions.
   3. Backfilling around relocated utilities, facilities, lines and structures shall be in accordance with the section "Trenching, Backfilling and Compaction,".

E. Work affecting existing gas distribution system shall be in accordance with the minimum federal safety standards under Title 49 -- Transportation, Chapter 1 -- Materials Transportation Bureau, Department of Transportation - - Part 192 -- Transportation of Natural and other Gas by Pipeline and The American Society of Mechanical Engineers' Guide material relating to the standards.

F. Work affecting water distribution systems which will take fire hydrants out of service must be coordinated with the local Water Department and Fire Department. The Contractor shall be prepared to take whatever measures are necessary to restore fire flows in the event of an emergency or provide for temporary fire flow service in accordance with the requirements of the local Fire Department.

G. The Owner, Engineer and Utility Owner shall be notified 48 hours in advance of all tie-ins to existing utility systems.

H. All new utility services requiring connection to existing utility systems shall remain isolated from the existing utility until all required tests have been satisfactorily complied with and if required, the service has been inspected and approved by the respective utility owner.

I. All materials and construction methods used for the connection to an existing utility and the requirements for protecting the same shall comply with the respective utility company's requirements.

**1.03 DEFINITIONS**

A. Interference with the work of utilities that may require re-routing or removal, relocation or replacement is defined as utilities that are either approximately parallel with the new pipeline and within the two vertical planes enclosed by the maximum trench width, as shown on the drawings, plus 6 inches on each side (total of 1 foot added to the maximum trench width) or crossing the pipe at any angle and at the same elevation as the proposed piping so as to be in direct conflict. All other utilities, including all house laterals and services, approximately parallel to the new pipeline but outside of the maximum trench width plus 1 foot, or crossing the pipe trench at any angle and not in direct conflict with the proposed piping are the obligation of the Contractor to remove, relocate or replace at no additional cost to the owner.

B. Utilities are defined as any pipelines, conduits, wires or other facilities that convey fuel, gas, water, sewage or storm water; transmit electricity, voice communications, television, signals or alarms; and similar related services.

**1.04 SUBMITTALS**

A. Prior to construction, the proposed method of connection and list of materials to be used for the necessary utility connections shall be submitted in accordance with the requirements of Division 1.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

A. All materials used for relocation or replacement of utilities and structures shall be of an equivalent material, type, class grade and construction as that existing, or as approved by the respective owners thereof.

**PART 3 EXECUTION**

**3.01 NOT USED**

**END OF SECTION 33 01 10**

**SECTION 33 01 10.58**
**DISINFECTION OF WATER UTILITY PIPING SYSTEMS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Disinfection of site domestic water lines and site fire water lines specified in Section 33 14 16.

### 1.02 RELATED REQUIREMENTS

A. Section 33 14 16 - Site Water Utility Distribution Piping.

### 1.03 REFERENCE STANDARDS

A. AWWA B300 - Hypochlorites; 2024.

B. AWWA B301 - Liquid Chlorine; 2024.

C. AWWA B302 - Ammonium Sulfate; 2023.

D. AWWA B303 - Sodium Chlorite; 2024.

E. AWWA C651 - Disinfecting Water Mains; 2023.

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

## PART 2 PRODUCTS

### 2.01 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300 Hypochlorite, AWWA B301 Liquid Chlorine, AWWA B302 Ammonium Sulfate, and AWWA B303 Sodium Chlorite.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that piping system has been cleaned, inspected, and pressure tested.

B. Schedule disinfecting activity to coordinate with start-up, testing, adjusting and balancing, demonstration procedures, including related systems.

### 3.02 DISINFECTION PROCEDURE

A. Preliminary Flushing
   1. The main shall be flushed prior to disinfection. The flushing velocity shall not be less than 2.5 feet per second.

B. Form of Chlorine for Disinfection
   1. The most common forms of chlorine used in disinfecting solutions are liquid chlorine (gas at atmospheric pressure), calcium hypochlorite granules, and sodium hypochlorite solution.
      a. Liquid chlorine shall be used only when suitable equipment is available, and only under the direct supervision of a person familiar with the physiological, chemical and physical properties of this element, and who is properly trained and equipped to handle any emergency that may arise. The introduction of chlorine gas directly from the supply cylinder is unsafe and should not be permitted.
         1) The preferred equipment consists of a solution feed chlorinator in combination with a booster pump for ingesting the chlorine gas/water mixture into the main to be disinfected. Direct feed container chlorinators are not recommended because their use is limited in situations where water pressure is lower than the chlorine cylinder pressure.
      b. Calcium hypochlorite contains 70% available chlorine by weight. It is either granular or tabular in form. Tablets, 6 and 9 to the ounce, are designed to dissolve slowly in water. Chlorine solution is prepared by dissolving the granules in water in a proportion required for the desired concentration.

c. Sodium hypochlorite is supplied in strengths from 5.25 to 16 percent available chlorine. It is packaged in liquid form in glass, rubber, or plastic containers ranging in size from one quart bottles to five gallon carboys. It may also be purchased in bulk for delivery by tank truck.

1) The chlorine-water solution is prepared by adding hypochlorite to water. Product deterioration must be reckoned with in computing the quantity of sodium hypochlorite required for desired concentration.

**3.03 APPLICATION**

A. Hypochlorite Solutions

1. The hypochlorite solutions shall be applied to the water main with a gasoline or electrically powered chemical feed pump designed for feeding the chlorine solutions. For small applications, the solutions may be fed with a hand pump, for example, a hydraulic test pump.
2. Feed lines shall be of such material and strength as to withstand safely the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the hypochlorite solution is applied to the main

B. Methods of Chlorine Application

1. Continuous Feed Method:
2. This method is suitable for general application. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the newly-laid pipeline. At a point not more than 10 feet downstream from the beginning of the new main, the water entering the new main shall receive a dose of chlorine, also fed at the constant, measured rate. The two rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 25 mg/l available chlorine. To assure that this concentration is maintained, the chlorine residual should be measured at regular intervals in accordance with the procedures described in the current edition of Standard Methods of AWWA M12 - Simplified for Water Examination.

a. Table II gives the amount of chlorine residual required for each 100 ft. of pipe in various diameters. Solutions of one percent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires approximately 1 lb. of calcium hypochlorite in 8.6 gallons of water. If liquid laundry bleach with 5.25% CL is used, then 4.25 gallons of water is to be mixed with 1 gallon of bleach to obtain 1 percent solution.

**TABLE II**

Chlorine Require to Produce 25 mg / 1

Concentration in 100 ft. of Pipe

| Pipe Size (inch) | Volume of 100-ft. length (gallons) | 100 Percent Chlorine (lb.) | 1 Percent Chlorine Solutions (gal.) |
|---|---|---|---|
| 4 | 65.3 | .013 | 0.16 |
| 6 | 146.5 | .030 | 0.36 |
| 8 | 261.0 | .054 | 0.65 |
| 10 | 408.0 | .085 | 1.02 |
| 12 | 588.7 | .120 | 1.44 |

b. Note: All lines smaller than 4" shall be disinfected with the same concentration used for 4" lines per the New York State Department of Health.

c. During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine

application shall not cease until the entire main is filled with the chlorine solution. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves discharge hose connections in the section shall be operated in order to disinfect the appurtenances. At the end of this 24 hour period, the treated water shall contain no less than 10 mg/l chlorine throughout the length of the main.

3. Slug Method
    a. This method is suitable for use with mains of large diameter for which, because of the volumes of water involved, the continuous feed method is not practical.
    b. Water from the existing distribution system or other approved source of supply shall be made to flow at a constant, measure rate into the newly laid pipeline. The water shall receive a dose of chlorine, also fed at a constant measured rate. The two rates shall be proportioned so that the concentration in the water entering the pipeline is maintained at no less than 100 mg/l. The chlorine shall be applied continuously and for a sufficient period to develop a solid column or "slug" of chlorinated water that will as it passes along the line, expose all interior surfaces to a concentration of at least 100 mg/l for at least 3 hours. The application shall be checked at a tap near the upstream end of the line by chlorine residual measurements made according to the procedures described above.
    c. As the chlorinated water flows past tees and crosses, related valves and discharge hose connection shall be operated as to disinfect appurtenances.
4. Tablet Method
    a. The "tablet method" as contained in American Water Works Association Standard C-651 is not acceptable to the New York State Department of Health and shall not be used.

**3.04 FINAL FLUSHING**

A. After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than 1 mg/l. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline. Heavily chlorinated water shall be de-chlorinated prior during flushing, or shall be flushed into a tanker truck for proper disposal. At no time shall heavily chlorinated water be discharged into the storm or sanitary sewer systems.

**3.05 BACTERIOLOGICAL TESTS**

A. After final flushing and before the new water main is placed in service, two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected every 1,200 feet and from the end of the line, and at least one set from each branch in the water main. All samples shall be tested for bacteriological (chemical and physical) quality in accordance with "*Standard Methods for the Examination of Water and Wastewater*" and shall show the absence of coliform organisms; and, if required, the presence of a chlorine residual.

B. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate as required by "*Standard Methods for the Examination of Water and Wastewater*". No hose or hydrant shall be used in collection of samples. A suggested sampling tap consists of a standard corporation cock installed in the main with a copper tube goose-neck assembly. After samples have been collected, the goose-neck assembly may be removed, and retained for future use.

**3.06 REPETITION OF PROCEDURE**

A. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. When the samples are satisfactory, the main may be placed in service.

**3.07 PROCEDURE AFTER CUTTING INTO OR REPAIRING EXISTING MAINS**

A. The procedures outlined in this section apply primarily when mains are wholly or partially dewatered. Leaks or breaks that are repaired with clamping devices while the mains remain full

of water under pressure require no disinfection.

### 3.08 TRENCH TREATMENT

A. When an old line is opened, either by accident or by design, the excavation will likely be wet and badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from such pollution. Tablets have the advantage in such a situation because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation.

### 3.09 MAIN DISINFECTION

A. Swabbing and Flushing: The following procedure is considered as a minimum that may be used.
   1. Swabbing with Hypochlorite Solution: The interior of all pipe and fittings used in making the repair (particularly couplings and tapping sleeves) shall be swabbed with a 1 percent hypochlorite solution before they are installed.
   2. Flushing: Thorough flushing is the most practical means of removing contamination introduced during repairs. If valving and hydrant locations permit, flushing from both directions is recommended. Flushing shall be started as soon as the repairs are completed and continued until discolored water is eliminated.

B. Slug Method
   1. Where practicable, in addition to the procedures of swabbing and flushing, a section of main in which the break is located shall be isolated, all service connections shut off, and the section flushed and chlorinated as described, except that the dose may be increased to as much as 300 mg/l, and the contact time reduced to as little as hours. After chlorination, flushing shall be resumed and continued until discolored water is eliminated.

### 3.10 SAMPLING

A. Bacteriological samples shall be taken after repairs to provide a record by which the effectiveness of the procedures used can be determined. If the direction of flow is unknown, samples shall be taken on each side of the main break.

**END OF SECTION 33 01 10.58**

**SECTION 33 01 15**
**TESTING AND INSPECTING WATER LINES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirement for hydrostatic and leakage testing of water mains and appurtenances.

### 1.02 SYSTEM DESCRIPTION

A. The contractor shall furnish all labor, materials, tools and equipment necessary for or incidental to the performance of the pressure/leakage test.

B. The Engineer will supply the test gauge or else calibrate the contractor's gauge before and after the tests.

C. The contractor shall be responsible to secure a water supply for flushing and testing at no additional cost to the owner.

D. A pressure/leakage test will be performed on all water mains, valves and fittings in the system constructed. The pressure/leakage test shall be conducted in accordance with these specifications and the applicable requirements of AWWA C600 (latest edition). Where any section of a main is provided with concrete thrust blocks, the test shall not be made until at least 5 days have elapsed after the concrete was installed.

E. All testing of water lines shall be done in the Engineer's or Water Department's presence and under their direction.

F. All individual valve sections shall be tested separately.

### REFERENCE

A. AWWA C600 (latest edition) - Standard for the Installation of Ductile-Iron Water Mains and Their Appurtenances.

### SUBMITTALS

A. Proposed locations to be tested and methods of testing shall be submitted for review one week before the actual testing.

## PART 3 EXECUTION

### 4.01 TESTING PROCEDURE

A. The pipe, fire hydrant assemblies, and appurtenances being tested shall be flushed and entirely free from any and all debris, stones, sand and any other materials. Water used in flushing the lines shall not be discharged into clean sections of pipeline or active mains, but shall be disposed of as specified in the appropriate parts of the section "Dewatering," Division 2. Disposal of Waste Materials shall be in conformance with the requirements of the Section "Waste Materials Disposal", Division 1.

B. All air shall be expelled from the section to be tested by appropriate methods including the use of corporation stops at high points. After all the air has been expelled, the test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connections, and all necessary apparatus shall be furnished by the contractor at the Contractor's expense.

C. The test pressure shall be at least one and a half times the maximum working pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge. However, in no case shall the test pressure be less than 150 pounds per square inch. Each hydrostatic test shall be held at the test pressure for a duration of at least two hours. Additional water shall be added as required to maintain the test pressure.

D. Concurrently with the pressure test, a leakage test shall be conducted. Leakage is defined as the quantity of water that must be added to the pipe to maintain the test pressure. Maximum allowable leakage shall be determined by the following formula: **SD sqrt/P over L= 1458,000**

1. Where,

a. L = Allowable leakage, in gals/hour
b. S = Length of test section, in feet
c. D = Nominal diameter of pipe, in inches
d. P = Average test pressure during test, in PSIG

E. Tolerance for test pressure shall be plus or minus 5 psi.

F. Where the leakage for the section tested is greater than that allowed, the contractor shall locate and repair the cause of the leak and retest the section until the leakage does not exceed the allowable.

**END OF SECTION 33 01 15**

**SECTION 33 01 17**
**TESTING AND INSPECTION OF GRAVITY LINES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements describing the testing and inspection of gravity lines.

### 1.02 SYSTEM DESCRIPTION

A. Visual Inspection
   1. Upon completion of the installation of the pipe and backfilling and compacting of the trench, the pipe shall be visually inspected. This inspection shall be undertaken as the work progresses. The engineer shall be notified a week in advance of such inspection and the contractor shall provide all facilities, materials, equipment and labor required for such inspection.
   2. All foreign material, dirt, debris or other objects found in the interior of the pipe shall be removed by the contractor. Visible defects such as broken pipe sections, improperly installed gaskets, projecting connections, cracks, visible leaks or other defects shall be noted, corrected and the pipe reinspected.

B. Infiltration/Exfiltration Testing
   1. The engineer shall be notified two weeks in advance of infiltration/exfiltration testing.
   2. An infiltration test shall be performed for those lines where the ground water level is at least 2 feet higher than the top of the pipe at the upstream manhole. Where ground water level is lower than two feet above the top of the pipe at the upstream manhole, an exfiltration test shall be performed. Air testing shall be used for the exfiltration test.
   3. Rate of infiltration or exfiltration shall not exceed one-hundred gallons per mile per inch of diameter of pipe for 24 hours. Air test allows minimum amount of time for air pressure inside pipe to drop from 3.5 PSIG to 2.5 PSIG; allowable time is a function of pipe size. These requirements will be met for every test section of pipe; it is not a cumulative average over several test sections of pipe. The phrase "per mile" shall refer to the total length of main sewer, measured through manholes, plus the lengths of all connections, laterals and branches.
   4. The contractor shall construct all bulkheads; provide weirs or other means of measurement, pumps, water, plugs, fittings, meters, lights, hoses and all else necessary for inspection and testings.

C. Minimum Pipe Slope
   1. Pipes installed at less than the slopes shown on the drawings shall be reinstalled by the contractor to the design slope shown or the contractor shall demonstrate to the engineer's and owner's satisfaction that the design capacity and velocity can be achieved.

D. During the one year correction period, the system or any part thereof, may be reinspected and/or retested if it is determined by the engineer that defective materials or unsatisfactory work may exist, or that excessive leakage may be occurring. Contractor shall perform the reinspection, retesting, removal and replacement of defective work at no additional cost to the owner.

### 1.03 REFERENCES

A. ASTM F-1417-92 (reapproved 2005) – “Standard Test method for Installation Acceptance of Plastic gravity Sewer Lines Using Low-Pressure Air”.

### 1.04 SUBMITTALS

A. Certified copies of all tests and final inspection reports shall be submitted to the engineer.

**PART 2 PRODUCTS NOT USED**

**PART 3 EXECUTION**

**3.01 PREPARATION**

A. The pipe section being tested shall be entirely free from any and all debris, stones, sand and any other materials. Water used in flushing the lines shall not be discharged into clean sections of pipeline or active sewers, but shall be discharged as specified in the appropriate parts of the Section "Dewatering," Division 2. Disposal of debris and all other material shall be in conformance with the requirements of the Section "Waste Materials Disposal," Division 1.

**3.02 FIELD QUALITY CONTROL**

A. The first section of pipe (between two manholes) laid by each pipe crew will immediately be tested upon completion in order to check workmanship.

B. Lines shall be visually inspected from manhole to manhole by the engineer. The contractor shall furnish two men to assist the engineer in making the inspection. It is a condition of acceptance that all manholes be complete, the pipe be cleaned, and all lines be laid straight from manhole to manhole unless otherwise shown on the drawings. All defects noted during this inspection shall be corrected by the contractor to the satisfaction of the engineer. After correction the lines shall be reinspected.

C. When the gravity lines have been satisfactorily inspected visually, an infiltration or exfiltration test shall be performed.

D. Infiltration/exfiltration rates shall be determined on the main sewer and laterals and shall be within the allowable rate as specified. All wyes, tees and other fittings in the main sewer line and laterals shall be adequately capped or plugged to withstand the maximum anticipated head during exfiltration testing and to prevent debris, groundwater, etc., from entering during infiltration testing. All caps or plugs which "blow-out" or leak shall be replaced as often as necessary by the contractor at no additional cost to the owner until the main sewer passes the infiltration/exfiltration test. All sewers not in compliance with these requirements shall be corrected by the contractor until such time as the rate can be met. Such corrections as necessary shall be made by the contractor at no additional cost to the owner.

E. When performing an infiltration test, the contractor shall block off a section of the system not exceeding 1000 linear feet, and install a measuring device at the downstream end of the test section. Infiltration shall not exceed the allowable amount specified. If the actual infiltration exceeds the allowable infiltration or if there are visible signs of infiltration such as gushing or spurting streams, the contractor shall effect all repairs necessary to make the pipe sufficiently watertight. The section shall be retested until the rate of allowable infiltration is met.

F. Air testing shall be used instead of the water exfiltration test to measure exfiltration. The section to be tested shall be between consecutive manholes. Each end of pipe, all branches, laterals, and wyes shall be plugged and securely braced. The plug at each end of pipe shall have provision to connect an air hose. Air shall be supplied to the section and monitored so as not to exceed 5.0 PSIG. An independent air gauge and line shall be installed on the opposite plug to the air supply such that the gauge can be read at the ground surface. The air pressure shall be maintained between 4.0 and 3.5 PSIG for at least two minutes to allow air temperature to come to equilibrium with pipe walls. The air supply shall then be disconnected and the air pressure allowed to decrease to 3.5. PSIG. At 3.5 PSIG, the time shall be measured for the pressure to drop to 2.5 PSIG. The following table shows the allowable time for a loss of 1.0 PSIG at an average pressure of 3.0 PSIG.

| Pipe Dia. Ins. | Min. Time Mn:Sc | Lngth For Min. Time, Ft | Time For Longer Lengths,Sec. | Specification time for Length (L) Shown, min:sec | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 100 ft | 150 ft | 200 ft | 250 ft | 300 ft | 350 ft | 400 ft | 450 f5 |
| 4 | 3:46 | 597 | 0.380 L | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 5:40 | 309 | 0.854 L | 5:40 | 5:40 | 5:40 | 5:40 | 5:40 | 5:40 | 5:42 | 6.24 |
| 8 | 7:34 | 298 | 1.520 L | 7:34 | 7:34 | 7:34 | 7:34 | 7:36 | 8:52 | 10:08 | 11:24 |
| 10 | 9:26 | 239 | 2.374 L | 9:26 | 9:26 | 9:26 | 19:53 | 11:52 | 13:51 | 15:49 | 17:48 |
| 12 | 11:20 | 199 | 3.418 L | 11:20 | 11:20 | 11:24 | 14:15 | 17:05 | 19:56 | 22:47 | 25:38 |
| 15 | 14:10 | 159 | 5.342 L | 14:10 | 14:10 | 17:48 | 22:15 | 26:42 | 31:09 | 35:36 | 40:04 |
| 18 | 17:00 | 133 | 7.692 L | 17:00 | 19:13 | 25:38 | 32:03 | 38:27 | 44:52 | 51:16 | 57:41 |
| 21 | 19:50 | 114 | 10.470 L | 19:50 | 26:10 | 34:54 | 43:37 | 52:21 | 61:00 | 69:48 | 78:31 |
| 24 | 22:40 | 99 | 13.674 L | 22:47 | 34:11 | 45:34 | 56:58 | 68:22 | 79:46 | 91:10 | 102:33 |
| 27 | 25:30 | 88 | 17.306 L | 28:51 | 43:16 | 57:41 | 72:07 | 86:32 | 100:57 | 115:22 | 129:48 |
| 30 | 28:20 | 80 | 21.366 L | 35:37 | 53:25 | 71:13 | 89:02 | 106:50 | 124:38 | 142:26 | 160:15 |
| 33 | 31:10 | 72 | 25.852 L | 43:05 | 64:38 | 86:10 | 107;43 | 129;16 | 150:43 | 172:21 | 193:53 |
| 36 | 34:00 | 66 | 30.768 L | 51:7 | 76.55 | 102:34 | 128:12 | 153:50 | 179:29 | 205.07 | 230:46 |

G. If the actual time for a loss 1.0 PSIG is less than the allowable time shown in the above table, the contractor shall determine the source of leakage and effect all repairs necessary to make the pipe sufficiently airtight. The section shall be retested until the allowable time is met or exceeded.

H. Pipes installed at slopes less than those shown on the drawings shall be reinstalled to the slopes as shown or the contractor shall provide a design report prepared and sealed by a professional engineer showing the theoretical capacity and velocity of the pipe "as installed" based on total energy head and the pipe manufacturer's "N" value. The theoretical "as installed" velocities and capacities shall be submitted to the engineer for evaluation. If the "as installed" theoretical capacity and velocity meet the design requirements the line will be acceptable.

1. If the "as installed" theoretical capacity and velocity do not meet the design requirements, the contractor shall conduct a flow test to determine the velocity and capacity with the pipe flowing one-half full. If the actual velocity and capacity meet the design requirement, the line is acceptable, otherwise the line shall be re-laid to the slope as shown on the drawings.

**END OF SECTION 33 01 17**

## SECTION 33 04 30
## DRAINAGE STRUCTURES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for constructing drainage structures.

### 1.02 SYSTEM DESCRIPTION

A. Unless otherwise shown on the drawings or required by field conditions and approved by the Engineer, all drainage structures shall be manufactured using wet-cast concrete methods only.

B. Drainage structures shall be designed for AASHTO H-20 loading.

C. Drainage structures shall be constructed with no sump from the lowest pipe invert, and with no weep hole in the bottom.

D. Access into manholes shall be provided as shown on the drawings.

E. Trench drains along roadways shall be provided where indicated on drawings.

### 1.03 REFERENCES

A. ASTM A 48 - Specifications for Gray Iron Castings.

B. ASTM C 32 - Standard Specifications for Sewer and Manhole Brick (made from clay or shale).

C. ASTM C 139 - Specifications for Concrete Masonry Units for Construction of Catch Basins and Manholes.

D. ASTM C 140 - Methods of Sampling and Testing Concrete Masonry Units.

E. ASTM C 207 - Specifications for Hydrated Lime for Masonry Purpose.

### 1.04 SUBMITTALS

A. Product Data: for each product indicated.

B. Shop drawings for catch basins shall conform with the provisions of the Section "Shop Drawings and Samples", Division 1, and shall include but not be limited to details on blocks, mortar, castings, steps, and construction details.

### PART 2 PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

A. Castings
   1. Curb inlet casting shall be Domestically made Pattern No. 2617 Campbell Foundry Company, Harrison, New Jersey, or approved equal. Curb piece shall be “Type-N” as manufactured by Campbell Foundry.
   2. Flat frame and grate shall be Domestically made Pattern No. 3408 Campbell Foundry Company, Harrison, New Jersey, or approved equal.
   3. 2' x 2' flat frame and grate shall be Domestically made Pattern No. R3433 Neenah Foundry Company, Neenah, Wisconsin, or approved equal.
   4. Storm drain manhole casting shall be Domestically made pattern No. 1012B, 1012D, 1184, and 1186D as noted on the plans, and as manufactured by Campbell Foundry Company, Harrison, New Jersey, or approved equal.

### 2.02 MATERIALS

A. Brick shall be concrete brick, sound, hard, and uniform burned brick in conformance with ASTM C 32.

B. Concrete block shall conform with ASTM C 139, except that 28-day compressive strength shall not be less than 4000 psi and absorption of individual block shall not exceed eight percent based on a 24-hour immersion test in conformance with ACI Standard PI-C-29. The test shall be in accordance with ASTM C 140.

C. Casting shall be close gained, tough gray iron, free from cracks, holes, swells and shrinkage distortion in accordance with ASTM A 48, Class 30.

D. Manhole steps shall be extruded aluminum 6061-T6 alloy or copolymer polypropylene plastic with ½" grade 60 steel reinforcement.

E. Filter fabric for trench drains shall be in accordance with Section "Geotechnic Fabric", Division 30.

F. Perforated high density polyethylene pipe for trench drains shall conform to the section "High Density Polyethylene Pipe", Division 30.

**2.03 MIXES**

A. Mortar for block or brick masonry shall be composed of Portland cement, hydrated lime, and sand. The volume of sand shall not be less than two and one half and not more than three times the volume of cement and lime. The proportion of cement to lime shall be 1:1/4. The quality of the items shall be:
   1. Cement shall be type II Portland cement.
   2. Hydrated lime shall be type S conforming to ASTM C 207.

B. Cast-in-Place concrete shall be an air entrained Portland cement, having a minimum 28-day strength of 3,000 psi.

**2.04 FABRICATION**

A. Castings
   1. Castings shall be domestically made, and shall be made accurately to the patterns and dimensions specified with carefully machined milled bearing surfaces. Non-domestic castings shall not be accepted. Contractor shall supply necessary paperwork to shown all castings are domestically made.
   2. Allowances shall be made in the patterns so that the specified thickness is not reduced.
   3. Frames and grates shall be match marked.
   4. No plugging, burning-in or filling will be allowed.

B. Block and brick shall be regular and uniform in shape and size, and of compact texture.

C. Catch basins shall be made in accordance with the regulations of the jurisdictional authority. The portion to be embedded in the wall shall be coated with a coal tar pitch varnish or other bituminous material.

**PART 3 EXECUTION**

**3.01 INSPECTION**

A. All components of the catch basins, including but not limited to, precast sections, block, brick and castings shall be inspected for defects.

B. Damaged pieces shall be repaired or replaced in accordance with the contract documents.

C. Damaged pieces that cannot be repaired shall be immediately removed from the job site.

**3.02 INSTALLATION**

A. Catch Basins.
   1. Catch basins shall be installed on a 12" compacted base course of Select Material #4, or crushed stone, extending one foot beyond the periphery of the base as shown of the drawings.
   2. Sections shall be set vertical and with sections and steps, if used, in true alignment.
   3. Inserts for lifting sections shall be thoroughly plugged with rubber plugs made specifically for the sections or with mortar. The mortar, made of 1 part cement to 1½ parts sand, and mixed slightly damp to the touch (just short of balling), shall be hammered into the holes until it is dense, and an excess of paste appears on the surface. Finish smooth and flush with the adjoining surfaces.
   4. All catch basin joints shall be parged inside and out with mortar.

5. Catch basins shall be backfilled with Select Material No. 4 (NYSDOT Item No. 304.12), and compacted in 6" lifts around the entire structure using a jumping jack compactor.

B. Catch Basins Frames and Grates
   1. Frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings.
   2. Catch basin frame shall be set upon two courses of concrete brick.
   3. Frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the masonry and the bottom flange of the frame shall be completely filled and watertight.
   4. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame. The pattern of catch basin frame and grate installed shall be as specified herein unless otherwise noted on the drawings.

C. Curtain Drains (Trench Drains)
   1. Curtain drains shall be constructed of 6” HANCOR smoothwall drain pipe, with perforations. Pipe shall meet the requirements of ASTM F810. It shall have a smooth interior and exterior. Pipe joints shall be bell-and-spigot. Pipe material shall be high-density polyethylene meeting ASTM D3350 minimum cell classification 324420C or E; or ASTM D1248 Type III, Class B or C, Category 4, Grade P33.
   2. All fittings used for bends and connections shall be PVC.
   3. Curtain drains shall be constructed to the dimensions as shown on the drawings or as specified.
   4. Curtain drains shall be sloped towards existing or proposed catch basins.
   5. Curtain drains shall be placed on the backside of the sidewalk where possible. Due to possible conflicts with retaining walls, curtain drain may be installed directly under the sidewalk towards the back edge of the walk in these instances, unless otherwise specified by the Engineer.
   6. Trench for curtain drain shall be pipe diameter plus 6" to either side of pipe.
   7. Perforated plastic pipe shall be placed upon a 4" layer of Select Material No. 2.
   8. Entire trench is to be wrapped in filter fabric with a 12" overlap.
   9. Curtain drain shall be filled with Select Material No. 2 and compacted.
   10. Top of curtain drain trench, behind curb, shall be 4" below final grade to allow for topsoil.
   11. Curtain drains shall be connected to catch basins and pipe parged at catch basins. All curtain drains shall pitched towards catch basins to allow for positive drainage of line.
   12. All ends of curtain drains shall be capped with PVC end caps.
   13. A Tee-Wye connection shall be installed for each resident, with caps placed on end. Where existing drains approach the back of the sidewalk, these drain lines shall be connected to the newly installed curtain drain.

D. FIELD QUALITY CONTROL
   1. Concrete samples and testing shall be done as required by the Engineer.

**END OF SECTION 33 04 30**

## SECTION 33 05 61
## CONCRETE MANHOLES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

### 1.02 RELATED REQUIREMENTS

### 1.03 REFERENCE STANDARDS

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

### 1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manhole covers, component construction, _____ , features, configuration, and dimensions.

C. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of penetrations.

### 1.05 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

### PART 2 PRODUCTS

**END OF SECTION 33 05 61**

**SECTION 33 16 16**
**DUCTILE IRON PIPE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirement for providing ductile iron pipe and fittings.

### SYSTEM DESCRIPTION

A. Ductile iron pipe shall be installed where shown on the Plans. Class of pipe shall be Class 52 unless otherwise shown on the Plans, and shall conform to ANSI/AWWA C151 (latest revision)/A21.51. Fittings shall be cast iron or ductile-iron, mechanical joint, Standard Class 250, or Compact Class 350, shall conform with ANSI/AWWA C110 (latest revision)/A21.10, ANSI/AWWA C111 (latest revision)/A21.11, and ANSI/AWWA C153 (latest revision)/A21.53, and NSF Standard 61. All ductile iron pipe shall be DOMESTICALLY MADE.

B. Ductile iron pipe placed in trenches shall have push-on joints in accordance with ANSI A21.11.

C. Fittings placed in trenches shall have mechanical joints in accordance with ANSI A21.11

D. Unless otherwise indicated on the plans, restrained joints shall be used to effectively resist all thrust forces, for plugs, bulkheads, caps, bends, and tees or as shown on the drawings.

E. The interior of all force main pipe and fittings, shall have a cement mortar lining with a bituminous seal coat.

F. All ductile iron pipe and fittings shall have an exterior bituminous coating in accordance with ANSI A21.8.

### 2.02 REFERENCES

A. ANSI A21.10 Standard for gray-iron and ductile iron fitting 3 inches through 48 inches for water and other liquids.

B. ANSI A21.11 Standard for rubber gasket joints for cast iron pressure pipe and fittings.

C. ANSI A21.50 Standard for the thickness design of ductile iron pipe.

D. ANSI/AWWA C151 (latest revision)/A21.51 Standard for ductile iron pipe, centrifugally cast in metal molds or sand lined molds, for water and other liquids.

E. AWWA C104 Standard (latest revision) for cement-mortar lining for cast iron and ductile iron pipe and fittings for water.

F. ANSI (AWWA C153) Standard (latest revision) for Compact Ductile Iron Fittings 3" - 16" for water and other liquids.

G. NSF Standard 61 - Drinking Water System Components.

### 2.03 SUBMITTALS

A. Shop drawings shall be submitted in accordance with the Section "Shop Drawings and Samples", Division 1, and shall include pipe and design calculations.

## PART 2 PRODUCTS

### 3.01 ACCEPTABLE MANUFACTURERS

A. Pipe and fittings shall be as manufactured by U.S. Pipe and Foundry, Birmingham, Alabama, or equal.

B. Foster Adaptor shall be as supplied by IN FACT, Corporation.

### 3.02 MATERIAL

A. Pipe shall be cast from iron with minimum tensile strength of 60,000 PSI, minimum yield strength of 42,000 PSI, and minimum elongation of ten percent (Grade 60-42-10).

B. Fittings shall be cast from iron with minimum tensile strength of 70,000 PSI, yield strength of 50,000, and minimum elongation of five percent (Grade 70-50-05).

C. Gaskets for pipe joints shall conform to the provisions of ANSI A21.11.

D. Foster Adaptor shall be rated for 350 psi, and shall be asphalt coated.

**3.03 MIXES**

A. Cement mortar lining shall conform with AWWA C104.

**3.04 FABRICATION**

A. Ductile iron pipe shall be fabricated in accordance with ANSI/AWWA C151 (latest revision)/A21.51.

B. Cement-mortar lining and bituminous seal coat shall be in accordance with AWWA C104 (latest revision).

C. Fittings shall be fabricated in accordance with ANSI A21.10.

D. Pipe shall be made in 18 to 20 foot lengths and shall be marked in accordance with Section 51-11 of ANSI A21.51.

E. Foster Adaptor shall be meet all ANSI/AWWA C153/A21.53 standards.

**3.05 THRUST RESTRAINT**

A. Thrust blocks shall be placed at all bends, plugs, caps, tees, or where otherwise shown on the Plans or required by the Engineer.

B. Thrust restraint system shall conform to the requirements of the Section "Restraint Systems", Division 2.

C. Concrete shall have a minimum 28-day compressive strength of 2500 psi.

**PART 3 EXECUTION**

**4.01 INSTALLATION**

A. Pipe and fittings shall be inspected prior to installation for defects. Pipe or fittings found to be defective shall be immediately removed from the project site and replaced in accordance with the contract documents.

B. Pipe and fitting shall be installed in accordance with AWWA C-600 (latest revision) and manufacturer's published installation guides.

C. Mechanical joint tapped tees shall be provided at all locations for taps larger than 1".

D. Joints shall be cleaned of all excess material and wiped clean and dry and free from oil and grease.

E. Pipe bedding shall be prepared in accordance with the Section "Pipe Embedment Zone", Division 2 and as shown on the drawings.

F. Pipe shall be protected from lateral displacement by installation of pipe bedding material as shown on the drawings and specified in the Section "Pipe Embedment Zone", Division 2.

G. Pipe shall be protected from flotation by placing adequate backfill as shown on the drawings and specified in the Section "Pipe Embedment Zone," Division 2.

H. Pipe shall be laid to conform to lines and grades shown on the Plans or as directed by the Engineer.

I. Where thrust blocks are installed, excavation shall be carried out by hand to provide good bearing against undisturbed material within a short distance from the pipe or fitting. Thrust restraint shall be installed in accordance with the Section "Restraint Systems", Division 2.

J. Contractor shall supply solid casted transition sleeve where outer diameter of existing pipe does not accept any of the proposed fittings.

K. During construction, watertight plugs shall be provided in the end of the pipes while work is not in progress.

### 4.02 FIELD QUALITY CONTROL

A. The pipeline trench shall not be backfilled until the installation has been observed by the Engineer.

B. Leakage and hydrostatic tests shall be performed on all pipe and fittings and shall comply with the provisions for testing specified in Division 2.

C. Joint deflection shall not exceed the maximum joint deflection as listed in CIPRA Handbook.

**END OF SECTION 33 16 16**

## SECTION 33 16 17
## RESTRAINT SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for providing restraint systems to resist axial thrust.

### 1.02 SYSTEM DESCRIPTION

A. Install joint restraints/thrust blocks to resist axial thrust at the locations and of the size and type shown on the drawings. Unless thrust blocks are shown on the drawings, only joint restraints shall be used.

B. Unless otherwise shown on the drawing, joint restraints shall consist of:
   1. Mechanical joint pipe with mechanical joint retainer glands
   2. "Locked" or "anchoring" type pipe and fittings as manufactured by EBAA Iron Sales, Inc. Mega-Lug Series 1100 or equal.

C. Length of pipe to be restrained shall be as shown on the schedule of joint restraints as shown on the drawings.

D. Thrust blocks shall be constructed of concrete as shown on the drawings.

### 1.03 REFERENCES

A. Bulletin No. 24 - "Outside Protection" as issued by the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts, 02269.

B. ASTM E18 - Test for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials.

C. ANSI A21.10 - Standard for Gray-Iron and Ductile Iron Fittings 2 Inches through 48 Inches for Water and Other Liquids.

D. New York State Department of Transportation Standard Specifications

### 1.04 SUBMITTALS

A. Submit manufacturer's certification or certified test results indicating conformance with the requirements of these specifications for retainer glands and other joint restraint materials.

B. Submit manufacturer's data for "locked" or "anchoring" type pipe and fittings.

### PART 2 PRODUCTS

### 2.01 MATERIALS

A. Mechanical joint retainer glands shall conform to the applicable requirements on ANSI A21.10 and shall be cast of ductile iron, fitted with cup point, square headed set screw and approved by Underwriter's Laboratories, Inc. Set screw hardness, when tested in accordance with ASTM E18, shall reflect a core hardness within the range of Rockwell C42-48 and a case surface hardness of Rockwell 15N-87 (minimum).

B. "Locked" or "anchoring" type pipe and fittings shall conform to the contract documents.

C. Rods, clamps with washers, straps and other required hardware shall conform to the applicable requirements of "Figures 96. General Information" of Bulletin 24 or as otherwise approved by the Engineer.

D. Thrust blocks shall be concrete with a minimum compressive strength of 2,500 psi.

### PART 3 EXECUTION

### 3.01 INSTALLATION

A. Mechanical joint retainer glands shall be installed in accordance with the manufacturer's commended installation requirements and as required by the "Schedule of Joint Restraints" as shown the drawings. Torque on the set screws shall not exceed that recommended by the manufacturer and shall be applied using an approved torque wrench.

B. "Locked" or "anchoring" type pipe and fittings shall be installed in accordance with the manufacturer's recommended installation procedures.

C. Rods, clamps with washers, straps and other required hardware shall be installed in accordance with the applicable requirements of Figures 96-1 through 96-37 in Section 96 of Bulletin 24 or as shown on the drawings.

D. Concrete thrust blocks shall be constructed in accordance with the applicable requirements of the NYSDOT Standard Specifications, and as shown on the drawings. All thrust blocks shall be placed against undisturbed native soil and in such a manner that the pipe and joints will be accessible for inspection or repair.

**END OF SECTION 33 16 17**

**SECTION 33 16 25**
**TAPPING SLEEVES AND VALVES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for providing tapping sleeves and valves.

### 1.02 SYSTEM DESCRIPTION

A. Provide tapping sleeves and valves to connect to the existing system. Size and location shall be as shown on the drawings and/or as specified in the contracts.

### 1.03 REFERENCES

A. ASTM A 126 - Specifications for Grey Iron Castings for Valves, Flanges and Pipe Fittings, Class B.

B. ASTM A 240 - Specifications for Heat-Resisting Chromium and Chromium- nickel Stainless Steel Plate, Sheet and Strip for Fusion-Welded Pressure Vessels.

C. ANSI B16.1 - Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 125.

D. AWWA C110 (latest revision) - Standard for Grey Iron Ductile Iron Fittings 2-inch through 48-inch for Water and Other Liquids.

E. AWWA C111 (latest revision) - Standard for Rubber Gasket Joints for Cast Iron and Ductile Iron Pressure Pipe and Fittings.

F. AWWA C509 (latest revision) - Standard for Resilient Seated Gate Valves 3 through 12 NPS for Water and Other Liquids.

G. NSF Standard 61 - Drinking Water System Components.

### 1.04 SUBMITTALS

A. Shop drawings shall be submitted in accordance with the Section "Shop Drawings and Samples", Division 1.

## PART 2 PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

A. Tapping Sleeves and valves shall be as manufactured by Mueller Company.

### 2.02 MATERIALS

A. Tapping valves 4 inches and larger installed underground shall have mechanical joint ends, be resilient wedge, non-rising stem, as manufactured by Mueller. Tapping valves shall have square operating nuts and shall open left or counter-clockwise. Tapping Valves shall Mueller Model T-2360 and shall be Domestically Made.
   1. Valve boxes and covers shall be provided in accordance with the Section “Valves, Meters & Appurtenances”, Division 2, and shall be Domestically Made.
   2. Tapping sleeve shall be cast iron, mechanical joint, class 250, Mueller Model N-615, and shall be Domestically Made.
   3. Tapping sleeves shall conform to the applicable requirements for fittings in the Section “Ductile Iron Pipe”, Division 2.

### 2.03 FABRICATION

A. All valves and operators shall be fabricated complete and ready for installation when delivered.

B. All valves shall be marked to show name of manufacturer, the year of manufacture, maximum working pressure, and size of valve.

C. Valves shall be fusion epoxy coated on the interior and exterior with a minimum of 10 mils of Mueller Pro-Gard. Epoxy coating shall meet or exceed all applicable requirements of ANSI/AWWA C550 Standard (latest revision) and be certified to ANSI/NSF 61.

## PART 3 EXECUTION

### 3.01 INSPECTION

A. All tapping sleeves and valves shall be inspected for damage or defects prior to their incorporation in the work. All tapping sleeves and/or valves found to be defective shall be removed from site.

### 3.02 PREPARATION

A. Prior to installation of the tapping sleeves and valves, the contractor shall clean them of all foreign materials and operate the tapping valve to insure it is not frozen in position.

### 3.03 INSTALLATION

A. All tapping sleeves and valves with valve boxes shall be installed in accordance with the manufacturer's recommendations and at the location and in the positions and configurations shown on the drawings.

B. Valve boxes shall be adequate for the trench depth so that when set on the valve, the cover is level with the pavement or the completed surrounding ground, whichever is applicable.

### 3.04 FIELD QUALITY CONTROL

A. Valves and appurtenances shall be field tested to determine that the valves operate as specified.

**END OF SECTION 33 16 25**

**SECTION 33 16 27**
**COPPER PIPE (BURIED) & NECESSARY FITTINGS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for providing buried copper pipe and fittings.

### 1.02 QUALITY ASSURANCE

A. All pipe shall be factory tested in accordance with the requirements of ASTM B88. All fittings shall meet or exceed AWWA C-800 Standards (latest revision).

### 1.03 SUBMITTALS

A. Product Data: for each type indicated.

B. Shop drawings shall be submitted in accordance with the Section "Shop Drawings and Samples", Division 1.

C. Certified factory test results shall be submitted on pipe and fittings manufactured for this project or another project within the past six months.

D. List stating size and number of water services to each building.

## PART 2 MATERIALS

### 2.01 SYSTEM DESCRIPTION

A. Copper pipe and fittings shall be used for the potable water lines and other piping less than two (2) inches in diameter unless otherwise indicated on the drawings.

B. All fittings shall be compressive type.

C. Buried copper pipe shall be tested to the pressures shown on the drawings and in accordance with the section "Testing and Inspection of Water Mains", Division 2.

D. Buried copper pipe shall be Type K conforming to ASTM B88.

E. A tap, equal to the existing size entering the building, shall be left or made for each required service connection (as shown on plans). Taps may be made by means of a tapped coupling at proper location or by cutting with an approved tapping machine, or by use of service saddles approved by Engineer. Taps shall be of the type thread to accept a standard corporation stop as supplied by Mueller. Mechanical joint tapped tees shall be used for all taps larger than 1" where new water main is being installed. Where tap is being made on existing water main, tapping saddle shall be Mueller BR-2-B-0899CC, for the appropriate size corporation valve to be installed.

F. Taps and corporation stops should be located at least 1' from pipe ends. Corporation stops shall be Mueller H-15013 (1.5" to 2").

G. Curb stops shall be Mueller H-15209 (¾" to 2"). The curb box shall be Mueller H- 10336 with foot base.

## PART 3 EXECUTION

### 3.01 INSPECTION

A. Pipe and fittings shall be checked for defects prior to their incorporation in the work. All pipe and fittings found to be defective shall be promptly removed from the site.

### 3.02 PREPARATION

A. Pipe shall be swabbed or brushed out prior to installation to insure that no foreign material gets into the finished line.

### 3.03 INSTALLATION/APPLICATION/ERECTION

A. Contractor shall obtain the size and number of water services entering into each building prior to construction of water main.

B. Pipe and fittings shall be installed in accordance with the manufacturer's recommendations.

C. New water services shall be installed from the new water main up to, and into, the existing residence. Installation of new water service shall include installing of k- copper, curb stop, water meter (supplied by others), backflow preventer, and connection to existing house water system.

D. Prior to water service switch over, homeowners shall be notified at least 24 hours in advance.

E. New copper line shall be backfilled with at least 12" of suitable material.

**3.04 ADJUSTING AND CLEANING**

A. Prior to final acceptance, the Contractor shall clean the lines of all foreign material.

**END OF SECTION 33 16 27**

**SECTION 33 16 28**
**VALVES, METERS AND APPURTENANCES - WATER**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for gate valves, meters and air release valves.

### 1.02 SYSTEM DESCRIPTION

A. Gate Valves
   1. Gate valve smaller than 3" shall be all bronze solid wedge type with rising spindle.
   2. Gate valves shall be iron body resilient-seat type with non-rising stems. Valves shall be furnished with "O" ring type packing. Valves shall be Mueller resilient-seat gate valves. Substitutions or equals are not allowed. Valves shall be Domestically Made.
   3. All gate valves shall open to the left (counter-clockwise).
   4. All gate valves shall be proportional for working pressures of 200 psi hydrostatical tested at 400 psi.
   5. Gate valve shall be supplied with a cast iron telescoping valve box and cover. Cover shall have the word "WATER" cast in top. Valve Box shall be Domestically Made.

### 1.03 REFERENCES

A. ASTM A 126 - Specifications for Grey Iron Castings for Valves, Flanges and Pipe Fittings, Class B.

B. ASTM A 240 - Specifications for Heat-Resisting Chromium and Chromium- nickel Stainless Steel Plate, Sheet and Strip for Fusion-Welded Pressure Vessels.

C. ANSI B16.1 - Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 125.

D. AWWA C110 (latest revision) - Standard for Grey Iron Ductile Iron Fittings 3-inch through 48-inch for Water and Other Liquids.

E. AWWA C111 (latest revision) - Standard for Rubber Gasket Joints for Cast Iron and Ductile Iron Pressure Pipe and Fittings.

F. AWWA C509 (latest revision) - Standard for Resilient Seated Gate Valves 3 through 12 NPS for Water and Other Liquids.

G. NSF Standard 61 - Drinking Water System Components.

### 1.04 SUBMITTALS

A. Shop drawings shall be submitted in accordance with the Section "Shop Drawings and Samples", Division 1.

B. Operation and maintenance data shall be submitted.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Gate Valves
   1. 3-inch and larger valves shall be as follows:
      a. The valve body and bonnets shall be fabricated of cast iron meeting the requirement of ASTM A 126.
      b. The valve stem shall be fabricated of bronze.
      c. Bolts shall be electro-plated steel with hex heads and hex nuts in accordance with ASTM A 307.
      d. The operating nut shall be fabricated of cast iron.

B. HydrantHYDRANT
   1. Hydrant to conform to AWWA C502 (latest revision), AWWA Standard for Dry Barrel Fire Hydrants.

2. Hydrants shall be Mueller Super Centurion 250. No substitutions or equals are allowed. Hydrants shall be Domestically Made.
3. Hydrant shall have 5¼" valve opening with compression shut off, opening against water pressure and breakaway traffic flange construction.
4. Inlet construction shall be 6" mechanical joint.
5. Bury length to be a minimum of 5 feet.
6. Nozzles: (2) 2½ " nozzles and (1) 4½" nozzle with national standard threads.
7. Hydrant shall open counterclockwise.
8. Hydrant nut size shall be national standard pentagon shaped operating nut measuring 1½" from point to float or come with matching cap and chain.
9. Hydrant to be painted to Owner's specifications.

**2.02 FABRICATION**

A. All valves and operators shall be fabricated complete and ready for installation when delivered.

B. All valves shall be marked to show name of manufacturer, the year of manufacture, maximum working pressure, and size of valve.

C. Valves 3-inch and larger shall be shop primed at the place of manufacture with an epoxy-polyamide primer compatible with the paint to be used in the field.

**PART 3 EXECUTION**

**3.01 INSPECTION**

A. All valves shall be inspected for damage or defects prior to their incorporation in the work. All valves found to be defective will be removed from site.

**3.02 PREPARATION**

A. Prior to installation of the valves, concrete and other surfaces shall be protected from jointing compounds, oil and other material used to install this work.

B. Prior to installation of the valves, the Contractor shall clean the body of all foreign material and operate the valve to insure it is not frozen in position.

**3.03 INSTALLATION**

A. All valves and meters shall be installed at the location and in the positions and configurations shown on the drawings.

B. Anchor blocks and/or clamp shall be provided as directed by the Engineer for the gate valves.

C. Valve boxes shall be adequate for the trench depth so that when set on the valve, the cover is level with the pavement or the completed surrounding ground, whichever is applicable.

D. Where ground water rises to within 2' of a fire hydrant base, the drain port shall be plugged. Any hydrant that is plugged shall be labeled in a manner satisfactory to the local Fire Department and Water Department to ensure that the hydrant is pumped out after each use.

**3.04 FIELD QUALITY CONTROL**

A. Valves, meters, hydrants, and appurtenances shall be field tested to determine that the valves operate as specified.

**END OF SECTION 33 16 28**

## SECTION 33 31 13
## SITE SANITARY SEWERAGE GRAVITY PIPING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Sanitary sewerage drainage piping, fittings, and accessories.

B. Connection of building sanitary drainage system to municipal sewers.

### 1.02 RELATED REQUIREMENTS

A. Section 31 23 16.13 - Trenching: Excavating, bedding, and backfilling.

### 1.03 DEFINITIONS

### 1.04 REFERENCE STANDARDS

A. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2020.

B. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2023.

C. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 2014 (Reapproved 2021).

D. ASTM F679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings; 2021.

### 1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating pipe, pipe accessories.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Project Record Documents:
   1. Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

### PART 2 PRODUCTS

### 2.01 SEWER PIPE MATERIALS

A. Provide products that comply with applicable code(s).

B. Plastic Pipe: ASTM D3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; bell and spigot style solvent sealed joint end.
   1. Pipe and fittings from 4" to 15" shall comply with ASTM D3034 with a wall thickness designation of SDR 35 or be manufactured to ASTM D3034 outside diameters and have a minimum pipe stiffness of 46 PSI pipe and fittings from 18" to 27 " shall comply with ASTM F679 and shall have a uniform wall thickness.
   2. Joints for PVC sewer pipe and fittings shall comply with ASTM D3212.
   3. Rubber gaskets for joints shall comply with AASTM F477.
   4. Maximum laying lengths for 4" and 6" laterals shall be 12½ ft.

C. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

### PART 3 EXECUTION

### 3.01 GENERAL

A. Perform work in accordance with applicable code(s).

### 3.02 TRENCHING

A. See Section 31 23 16.13 for additional requirements.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

### 3.03 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D2321.

B. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m).

C. Connect to building sanitary sewer outlet and municipal sewer system , through installed sleeves.

### 3.04 INSTALLATION - CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place cast-in-place concrete base pad, with provision for sanitary sewer pipe end sections.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

### 3.05 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 01 40 00.

B. Following installation of main line pipe and completion of backfill to existing grade, pipe shall be tested for deflection in the presence of the engineer. Optional devices for testing include properly sized Go-No-Go Mandrell or Delectometer. Maximum allowable deflection shall be five percent. All pipes found in which the deflection exceeds five percent shall be uncovered and reinstalled at no additional expense to the owner.

### 3.06 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

**END OF SECTION 33 31 13**

**SECTION 33 37 06**
**SANITARY SEWER SERVICE CONNECTIONS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for providing sanitary sewer service connections both gravity and low pressure connections.

### 1.02 SYSTEM DESCRIPTION

A. Contractor shall be responsible for locating all active sewer service connections located along the sewer main to be replaced or to be abandoned. Although these connections may have been shown on the plan drawings, it is the Contractor's responsibility to verify the location of all active sewer service connections regardless of what is shown on the plans. Contractor should meet with Orange County Sewer District and Village of Harriman representatives to verify the location of active sewer laterals connected to the sewer main, to ensure that all active sewer services are reconnected or abandoned as necessary. Contractor shall submit to the Engineer, documentation as to how the location of all active sewer services were determined, and where the active sewer services are located.
   1. To help in this endeavor, previous sewer televising reports have been included in the rear of the contract documents.

B. All data relative to the locations and size of the service connections shall be recorded on forms, supplied by the Contractor, and approved by the Owner.
   1. Each form shall be identified by property owner's name, street address, and lot and block number.
   2. These forms shall show the location of the end of the service connection.
   3. Service connections shall be signed by both the property owner and the Contractor's representative.

C. Contractor shall give written notice to property owners at least one week in advance of laying the street main, if new main is being laid, and shall locate the connection so that it will come off the street main 90° to the curb line in order to service the property owner's lowest service elevation or at a general location desired by the property owner, unless otherwise directed or permitted by the Engineer.

D. Service connections shall be made for all active sewer services as shown on the drawings and where located if not shown on the drawings.

E. Contractor shall remove all existing "non-active" sewer laterals to a point 2 to 3 feet behind the new curb line or 2 to 3 feet behind the new monolithic curb and sidewalk, unless otherwise direct by the Engineer. The end of abandoned services shall be plugged with brick and mortar to prevent sink holes from forming.

F. Contractor shall be responsible for contacting Orange County Sewer District in advance of all work and/or connections to existing sewer main.

### 1.03 SUBMITTALS

A. Shop drawings for service connections shall be submitted in accordance with the Section "Shop Drawings and Samples", Division 1.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION - NOT USED

**END OF SECTION 33 37 06**

## SECTION 33 41 00
## SUBDRAINAGE

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Building Perimeter Drainage Systems.

### 1.02 RELATED REQUIREMENTS

### 1.03 REFERENCE STANDARDS

A. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2021.

### PART 2 PRODUCTS

### 2.01 REGULATORY REQUIREMENTS

A. Comply with applicable code for materials and installation of the work of this section.

### 2.02 PIPE MATERIALS

A. Manufacturers:
   1. Advanced Drainage Systems, Inc.; www.ads-pipe.com.
   2. Charlotte Pipe and Foundry; www.charlottepipe.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Polyvinyl Chloride Pipe: ASTM D2729; plain end, 4 inch (100 mm) and 6 inch (150 mm) inside diameter; with required fittings.

C. Corrugated Plastic Tubing: HDPE, Flexible type; 4 inch (100 mm) and 6 inch (150 mm) diameter, with required fittings.

D. Use perforated pipe at subdrainage system; unperforated through sleeved walls.

### 2.03 AGGREGATE AND BEDDING

A. Filter Aggregate and Bedding Material: Granular fill as specified in Section 31 23 23.

### 2.04 ACCESSORIES

A. Pipe Couplings: Solid plastic.

B. Geotextile Fabric: As specified in Section 31 05 19.

### PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

### 3.02 PREPARATION

A. Remove large stones or other hard matter that could damage drainage piping or impede consistent backfilling or compaction.

### 3.03 INSTALLATION

A. Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions.

B. Place impervious fill over drainage pipe aggregate cover and compact.

### 3.04 PROTECTION

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

**END OF SECTION 33 41 00**

## SECTION 33 42 30
## STORMWATER DRAINS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Prefabricated trench drains.

B. Frames and grates.

#### 1.02 REFERENCE STANDARDS

A. AASHTO HB - Standard Specifications for Highway Bridges; 2005, with Errata.

#### 1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Weight rating for catch basins, drop inlets, trench drains, and frame and grates.

C. Shop Drawings: Indicate stack assembly, invert elevations, opening sizes, and pipe angles.

D. Manufacturer's Installation Instructions: Indicate special procedures for assembly.

### PART 2 PRODUCTS

#### 2.01 TRENCH DRAIN ELEMENTS

A. (33.4230.00) Exterior cast polymer trench drain; slotted galvanized steel grate; H20 loading; for tandem trailers with dual wheel load of 16,000 pounds.

B. (33.4230.01) Interior cast polymer trench drain; perforated or slotted galvanized steel grate; ADA compliant, extra heavy duty having safe live load up to 10,000 pounds.

C. (33.4230.10) EconoDrain 4.5 inch (114 mm) Trench Drain Forming System

D. (33.4230.11) EconoDrain 6 inch (152 mm) Trench Drain Forming System

E. (33.4230.12) EconoDrain 8 inch (203 mm) Trench Drain Forming System

F. (33.4230.13) EconoDrain 10 inch (254 mm) Trench Drain Forming System

G. (33.4230.14) EconoDrain 12 inch (305 mm) Trench Drain Forming System

H. (33.4230.15) EconoDrain 15 inch (381 mm) Trench Drain Forming System

I. (33.4230.16) EconoDrain 18 inch (457 mm) Trench Drain Forming System

J. (33.4230.17) EconoDrain 24 inch (610 mm) Trench Drain Forming System

K. (33.4230.20) EconoDrain PT-2 Extra Heavy Duty Trench Drain Forming System

L. (33.4230.21) EconoDrain PT-2 Extra Heavy DutyTrench Drain Forming System

#### 2.02 MANUFACTURERS

A. Trench Drains:
   1. Dura Trench a brand of Eric'sons, Inc: www.duratrench.com/#sle.
   2. Zurn Industries, LLC; www.zurn.com.
   3. ACO USA Drains: www.acodrain.com.
   4. ABT, Inc.: www:abtdrains.com.
   5. N.D.S.: www.ndspro.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.03 TRENCH DRAINS

A. Weight Rating: H-20 according to AASHTO HB.

B. Prefabricated Trench Drain: Polymer concrete, glass fiber reinforced, metal installation brackets.

C. Frames and Grates: Galvanized steel support, steel grate, linear pattern, match drain opening size.

D. Products:
   1. Dura Trench a brand of Eric'sons, Inc; Prefabricated Trench Drains: www.duratrench.com/#sle.
   2. _____.

## 2.04 BASIS OF DESIGN TRENCH DRAINS

A. Manufacturer:
   1. Acceptable Manufacturer: MultiDrain Systems, which is located at: P. O. Box 7107; Statesville, NC 28687; Toll Free Tel: 800-433-1119; Tel: 704-508-1010; Fax: 704-508-1011; Email:request info (steve.born@multidrainsystems.com); Web:http://www.multidrainsystems.com

B. Substitutions: See Section 01 60 00 - Product Requirements.

C. Material: Mild steel rails. Black, polyester powder coating.

D. **EconoDrain Trench Drains**
   1. **Product: No. 4 EconoDrain 4.5 inch (114 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms, grating/cover seat, grating and/or covers and system accessories.
      a. Construction: The trench drain system shall be EconoDrain No. 4 consisting of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, pre-welded grate frames anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
      b. Expanded Polystyrene Foam (EPS):
         1) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
      c. Grate Seat Rails:
         1) Left and right rail shall be affixed together and pre-welded to assure proper symmetry and planar accuracy.
         2) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
         3) Alignment clips shall be provided at the rail end welded to the angle frame.
         4) Eight anchor stands shall be provided per 8 foot length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
         5) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 2,480 lb per lineal foot (36 kN per m).
         6) Grate: EG-0424-1DI-B. 5-1/4 x 24 inch (133 x 610 mm); Secured to steel rails with locking device assembly ELD04.
            (a) Material: Ductile iron.
            (b) Open Area: 64.1 percent.
            (c) Load Rating: HS-25.
         7) Grate: EG-0424-1DI-ADA. ADA Compliant 5-1/4 x 24 inch (133 x 610 mm); Secured to steel rails with locking device assembly ELD04.
            (a) Material: Ductile iron.
            (b) Open Area: 30.4 percent.
            (c) Load Rating: HS-25.
         8) Grate: EG-0424-1DI-A. 5-1/4 x 24 inch (133 x 610 mm); Secured to steel rails with locking device assembly ELD04.
            (a) Material: Ductile iron.
            (b) Open Area: 51.9 percent.
            (c) Load Rating: H-20 and HS-25.

9) Grate: EG-0424-1CI-B2. 5-1/4 x 24 inch (133 x 610 mm); Secured to steel rails with locking device assembly ELD04.
   (a) Material: Cast iron.
   (b) Open Area: 55 percent.
   (c) Load Rating: H-20.
   (d) Grate: EG-0448-RGSC. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04-1.
   (e) Material: Reinforced galvanized steel.
   (f) Open Area: 0 percent (Closed).
   (g) Load Rating: H-20.
10) Grate: EG-0448-RSSC. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04-1.
   (a) Material: Reinforced stainless steel.
   (b) Open Area: 0 percent (Closed).
   (c) Load Rating: H-20.
11) Grate: EG-0448-RGSB. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04.
   (a) Material: Reinforced galvanized steel; slotted.
   (b) Open Area: 17 percent.
   (c) Load Rating: H-20.
12) Grate: EG-0448-RSSB. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04.
   (a) Material: Reinforced stainless steel; slotted.
   (b) Open Area: 17 percent.
   (c) Load Rating: H-20.
   (d) Grate: EG-0448-GSB. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04.
   (e) Material: Galvanized steel; slotted.
   (f) Open Area: 17 percent.
   (g) Load Rating: Pedestrian.
13) Grate: EG-0448-SSB. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04.
   (a) Material: Stainless steel; slotted.
   (b) Open Area: 17 percent.
   (c) Load Rating: Pedestrian.
   (d) Grate: EG-0448-GSP. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04-1.
   (e) Material: Galvanized steel; perforated.
   (f) Open Area: 8.5 percent.
   (g) Load Rating: Pedestrian.
14) Grate: EG-0448-SSP. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04.
   (a) Material: Stainless steel; perforated.
   (b) Open Area: 8.5 percent.
   (c) Load Rating: Pedestrian.
15) Grate: EG-0448-RGSP. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD040-1.
   (a) Material: Reinforced galvanized steel; perforated.
   (b) Open Area: 8.5 percent.
   (c) Load Rating: H-20.
   (d) Grate: EG-0448-RSSP. 5-1/4 x 48 inch (133 x 1219 mm); Secured to steel rails with locking device assembly ELD04-1.
   (e) Material: Reinforced stainless steel; perforated.

(f) Open Area: 8.5 percent.
(g) Load Rating: H-20.

16) Catch Basins: ECB0424: 4.5 x 24 x 24 inch (114 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate rail and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.

17) Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

2. **Product: No. 6 EconoDrain 6 inch (152 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms, grating/cover seat, grating and/or covers and system accessories.
   a. Construction: The trench drain system shall be EconoDrain No. 6 consisting of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, pre-welded grate frames or Bolt-In-Place grate rail spacer bars anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
   b. Expanded Polystyrene Foam (EPS):
      1) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
   c. Grate Seat Rails:
   d. Left and right rail shall be affixed together with pre-welded spacer rods or Bolt-In-Place grate rail spacer bars to assure proper symmetry and planar accuracy.
      1) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
   e. Alignment clips shall be provided at the rail end welded to the angle frame.
      1) Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
      2) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
3. Grate: EG-0824-1DI-A. 8 x 24 inch (203 x 610 mm); Secured to steel rails with locking device assembly ELD06.
   a. Material: Ductile iron.
   b. Open Area: 63.5 percent.
   c. Load Rating: HS25.
   d. Grate: EG-0824-1DIADA. ADA Compliant 8 x 24 inch (203 x 610 mm); Secured to steel rails with locking device assembly ELD06.
      1) Material: Ductile iron.
      2) Open Area: 38.1 percent.
      3) Load Rating: HS25.
   e. Grate: Banded Bar Grate: EG-0836-HPBG.
      1) Material: Steel. Shop black.
      2) Open Area: 66 percent.
      3) Square Inches per Linear Foot: 63.3.
      4) Grate: Banded Bar Grate: EG-0836-HGBG.
      5) Material: Steel. Galvanized coated.
      6) Open Area: 66 percent.

7) Square Inches per Linear Foot: 63.3.
8) Grate: Banded Bar Grate: EG-0836-HSBG.
9) Material: Stainless steel.
10) Open Area: 66 percent.
11) Square Inches per Linear Foot: 63.3.

f. Catch Basins: ECB0624: 6 x 24 x 24 inch (152 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, pre-welded grate frame or Bolt-In-Place grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 m x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.

g. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

4. **Product: No. 8 EconoDrain 8 inch (203 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms grating/cover seat, grating and/or covers and system accessories.

a. Construction: The trench drain system shall be EconoDrain No. 8 consisting of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, pre-welded grate frames or Bolt-In-Place grate rail spacer bars anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.

b. Expanded Polystyrene Foam (EPS):
1) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.

c. Grate Seat Rails:

d. Left and right rail shall be affixed together with pre-welded spacer rods or Bolt-In-Place grate rail spacer bars to assure proper symmetry and planar accuracy.
1) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
2) Alignment clips shall be provided at the rail end welded to the angle frame.
3) Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
4) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).

e. Grate: EG-1024-1DI-A2. 10 x 24 inch (254 x 610 mm); secured to steel rails with locking device assembly ELD08.
1) Material: Ductile iron.
2) Open Area: 66.3 percent
3) Load Rating: HS25
4) Grate: EG-1016-1DI-ADA. ADA Compliant 10 x 16 inch (254 x 406 mm); secured to steel rails with locking device assembly ELD08-1.
(a) Material: Ductile iron.
(b) Open Area: 48 percent.
(c) Load Rating: HS-25/FAA.
5) Grate: Banded Bar Grate: EG-1036-HPBG.
(a) Material: Steel. Shop black.
(b) Open Area: 68.4 percent.
(c) Square Inches per Linear Foot: 82.
6) Grate: Banded Bar Grate: EG-1036-HGBG.

(a) Material: Steel. Galvanized coated.
(b) Open Area: 68.4 percent.
(c) Square Inches per Linear Foot: 82.
(d) Grate: Banded Bar Grate: EG-1036-HSBG.
(e) Material: Stainless steel.
(f) Open Area: 68.4 percent.
(g) Square Inches per Linear Foot: 82.

7) Catch Basins: ECB0824: 8 x 24 x 24 inch (204 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, pre-welded grate frame or Bolt-In-Place grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate rail and grate., or ECB3360: 32.626 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
(a) Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

5. **Product: No. 10 EconoDrain10 inch (254 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms grating/cover seat, grating and/or covers and system accessories.
   a. Construction: The trench drain system shall be EconoDrain No. 10 consisting of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, Bolt-In-Place grate rail spacer bars anchored securely in concrete. Common rebar used for form stability and anti-flotation during pour and gratings.
   b. Expanded Polystyrene Foam (EPS):
      1) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
   c. Grate Seat Rails:
      1) Left and right rail shall be affixed together with Bolt-In-Place grate rail spacer bars to assure proper symmetry and planar accuracy.
      2) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
      3) Alignment clips shall be provided at the rail end welded to the angle frame.
      4) Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
      5) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
      6) Grate: EG-1224-1-DI-A. 12 x 24 inch (305 x 610 mm); secured to steel rails with locking device assembly ELD10.
         (a) Material: Ductile iron.
         (b) Open Area: 64.8 percent.
         (c) Load Rating: HS25.
      7) Banded Grate: EG-1236-HPBG.
         (a) Material: Steel. Shop black.
         (b) Open Area: 67.5 percent.
         (c) Square Inches per Foot: 97.3.
      8) Banded Bar Grate: EG-1236-HGBG.
         (a) Material: Steel. Galvanized coated.
         (b) Open Area: 67.5 percent.

(c) Square Inches per Foot: 97.3.

9) Banded Bar Grate: EG-1236-HSBG.
   (a) Material: Stainless steel.
   (b) Open Area: 67.5 percent.
   (c) Square Inches per Foot: 97.3.
10) Catch Basins:
   (a) ** NOTE TO SPECIFIER ** Delete catch basins not required from the next five paragraphs.
   (b) ECB1024: 10 x 24 x 24 inch (250 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, Bolt-In-Place grate rail and grate.
   (c) ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
   (d) ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
   (e) ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
   (f) ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
11) Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

6. Product: **No. 12 EconoDrain 12 inch (305 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including grating/cover seat, grating and/or covers and system accessories.
   1) Construction: The trench drain system shall consist of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, pre-welded grate frames or Bolt-In-Place grate rail spacer bar, anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
   2) Expanded Polystyrene Foam (EPS):
   3) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
7. Grate Seat Rails:
   a. Left and right rail shall be affixed together and pre-welded or Bolt-In-Place grate rail spacer bar to assure proper symmetry and planar accuracy.
   b. Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
   c. Alignment clips shall be provided at the rail end welded to the angle frame.
   d. Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
   e. Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
   f. Grate: EG-1424-1DI-A2P. 14 x 24 inch (355 x 610 mm); secured to steel rails with locking device assembly ELD12.
      1) Material: Ductile iron.
      2) Open Area: 67 percent.
      3) Load Rating: HS25.
   g. Grate: EG-1424-1DI-ADA. ADA Compliant 14 x 24 inch (355 x 610 mm); secured to steel rails with locking device assembly ELD12.
      1) Material: Ductile iron.
      2) Open Area: 33.1 percent.
      3) Load Rating: HS25.

h. Grate: Banded Bar Grate; EG-1436-HPBG.
    1) Material: Steel. Shop black.
    2) Open Area: 67 percent.
    3) Square Inches per Linear Foot: 112.5.
i. Grate: Banded Bar Grate; EG-1436-HGBG.
    1) Material: Steel. Galvanized coated.
    2) Open Area: 67 percent.
    3) Square Inches per Linear Foot: 112.5.
j. Grate: Banded Bar Grate; 1436-HSBG.
    1) Material: Stainless steel.
    2) Open Area: 67 percent.
    3) Square Inches per Linear Foot: 112.5.
k. Catch Basins: ECB1224: 12 x 24 x 24 inch (305 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, pre-welded grate frame or Bolt-In-Place grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
l. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

8. Product: **No. 15 EconoDrain 15 inch (381 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms grating/cover seat, grating and/or covers and system accessories.
    1) Construction: The trench drain system shall consist of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, Bolt-In-Place grate rail spacer bar. grate frames anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
    2) Expanded Polystyrene Foam (EPS):
    3) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
    4) Grate Seat Rails:
    5) Left and right rail shall be affixed together with Bolt-In-Place grate rail spacer bar to assure proper symmetry and planar accuracy.
    6) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
b. Alignment clips shall be provided at the rail end welded to the angle frame.
    1) Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
    2) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
c. Grate: EG-1724-CI-A - 17 x 24 x 1-1/2 inches (432 x 609 x 38 mm)
    1) Material: Cast iron.
    2) Open Area: 35.8 percent.
    3) Load: H-20
d. Grate: Banded Bar Grate; EG-1736-HPBG.
    1) Material: Steel. Shop black.
    2) Open Area: 67.5 percent.
    3) Square Inches per Linear Foot: 137.3.

e. Grate: Banded Bar Grate; EG-1736-HGBG.
    1) Material: Steel. Galvanized coated.
    2) Open Area: 67.5 percent.
    3) Square Inches per Linear Foot: 137.3.
f. Grate: Banded Bar Grate; EG-1736-HSBG.
    1) Material: Stainless steel.
    2) Open Area: 67.5 percent.
    3) Square Inches per Linear Foot: 137.3.
g. Catch Basins: ECB1524: 15 x 24 x 24 inches (305 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, Bolt-In-Place grate rail and grate., ECB2424: 24 x 24 x 24 inches (610 x 610 x 610 mm) catch basin assembly consisting of EPS Former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inches (610 x 610 x 1067 mm) catch basin assembly consisting of EPS Former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
h. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

9. Product: **No. 18 EconoDrain 18 inch (457 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms, grating/cover seat, grating and/or covers and system accessories.
    a. Construction: The trench drain system shall consist of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, Bolt-In-Place grate rail spacer bar grate rail anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
    b. Expanded Polystyrene Foam (EPS):
        1) EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
    c. Grate Seat Rails:
        1) Left and right rail shall be affixed together with Bolt-In-Place grate rail spacer bar to assure proper symmetry and planar accuracy.
        2) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
        3) Alignment clips shall be provided at the rail end welded to the angle frame.
        4) Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
        5) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
    d. Grate: EG-2024-DI-A. 20 x 24 x 1-1/2 inch (508 x 609 x 38 mm).
        1) Material: Cast iron.
        2) Open Area: 37 percent.
        3) Load: H-20.
    e. Grate: Banded Bar Grate; EG-2036-HPBG.
        1) Material: Steel. Shop black.
        2) Open Area: 68.8 percent.
        3) Square Inches per Linear Foot: 165.2.
        4) Light Duty.
    f. Grate: Banded Bar Grate; EG-2036-HGBG.
        1) Material: Steel. Galvanized coated.
        2) Open Area: 68.8 percent.

3) Square Inches per Linear Foot: 165.2.
4) Light Duty.

g. Grate: Banded Bar Grate; EG-2036-HSBG.
1) Material: Stainless steel.
2) Open Area: 68.8 percent.
3) Square Inches per Linear Foot: 165.2.
4) Light duty.

h. Catch Basins: ECB1824: 18 x 24 x 24 inch (457 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, Bolt-In-Place, field assembled grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.

i. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

10. Product: **No. 24 EconoDrain 24 inch (610 mm) Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms grating/cover seat, grating and/or covers and system accessories.

a. Construction: The trench drain system shall consist of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, Bolt-In-Place grate rail spacer bars and grate rails anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.

b. Expanded Polystyrene Foam (EPS):

c. EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.

d. Grate Seat Rails:
1) Left and right rail shall be affixed together and Bolt-In-Place spacer bars to assure proper symmetry and planar accuracy.
2) Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.

e. Alignment clips shall be provided at the rail end welded to the angle frame.
1) Eight anchor stands shall be provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
2) Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).

f. Grate: MG-2624-CI-A. 26 x 24 x 1-1/2 inch (660 x 609 x 38 mm).
1) Material: Cast iron.
2) Open Area: 38 percent.
3) Load: H-20.

g. Grate: Banded Bar Grate; EG-2636-HPBG.
1) Material: Steel. Shop black.
2) Open Area: 70 percent.
3) Square Inches per Linear Foot: 218.
4) Light Duty.

h. Grate: Banded Bar Grate; EG-2636-HGBG.
1) Material: Steel. Galvanized coated.
2) Open Area: 70 percent.
3) Light Duty.

4) Grate: Banded Bar Grate; EG2636-HSBG.
5) Material: Steel. Galvanized coated.
6) Open Area: 70 percent.
7) Square Inches per Linear Foot: 218.
8) Light duty.

i. Catch Basins: ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, Bolt-In-Place grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate rail and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.

j. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

E. Extra Heavy Duty Trench Drains

F. Product: **No. 8 EconoDrain PT-2 Extra Heavy Duty Trench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms grating/cover seat, grating and/or covers and system accessories.

1. Construction: The trench drain system shall consist of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, Bolt-In-Place grate rail spacer bars and grate rails anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
2. Expanded Polystyrene Foam (EPS):
   a. EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
3. Grate Seat Rails:
   a. Left and right rail shall be affixed together with Bolt-In-Place rail spacer bars to assure proper symmetry and planar accuracy.
   b. Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
   c. Alignment clips shall be provided at the rail end welded to the angle frame.
   d. Eight anchor stands provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
   e. Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
   f. Grate: EG-10162-DIA. 10 x 16 inch (254 x 406 mm) secured to steel rails with center locking device ELD08 or, secured to steel rails with two point shoulder bolt assembly.
      1) Material: Ductile Iron. Uncoated. or Ductile Iron. Hot dip galvanized.
      2) Open Area: 54 percent.
      3) Load Rating: ASHTO M306. H-20 and HS-25 and FAA AC 150 5320-6D.
   g. Catch Basins: ECB0824: 8 x 32 x 24 inch (204 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, Bolt-In-Place grate rail spacer bars, grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
4. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

G. Product: **No. 12 EconoDrain PT-2 Extra Heavy DutyTrench Drain Forming System** as manufactured by MultiDrain Systems, including EPS forms grating/cover seat, grating and/or covers and system accessories.
   1. Construction: The trench drain system shall consist of non-CFC Expanded Polystyrene Foam (EPS) interlocking pre-sloped removable forms having a minimum slope of 0.5 percent (1/16 inch per lineal foot of trench) and installed in standard 8 foot (2438 mm) sections, Bolt-In-Place grate rail spacer bars and grate rails anchored securely in concrete, common rebar used for form stability and anti-flotation during pour and gratings.
   2. Expanded Polystyrene Foam (EPS):
      a. EPS shall be non-CFC foam with a flame spread of less than 25 and Smoke Developed rating of less than 450 per ASTM E84 test method.
   3. Grate Seat Rails:
      a. Left and right rail shall be affixed together with Bolt-In-Place rail spacer bars to assure proper symmetry and planar accuracy.
      b. Material: Mild steel rails. Black, polyester powder coating., Mild steel rails. Galvanized., or Stainless steel.
      c. Alignment clips shall be provided at the rail end welded to the angle frame.
      d. Eight anchor stands provided per 8 foot (2438 mm) length to aid installation stability; allow simple grade adjustment and provide grate rail pull out resistance. The anchor stands shall be fully welded to the angle frame.
      e. Each rail shall provide a means to mechanically lock itself into the surrounding concrete. Rail pull out resistance shall not be less than 5,526 lb per lineal foot (80 kN per m).
      f. Grate: EG-14162-DIA. 14 x 16 inch (356 x 406 mm) secured to steel rails with center locking device ELD12 or, secured to steel rails with two point shoulder bolt assembly.
         1) Material: Ductile Iron. Uncoated. or Ductile Iron. Hot dip galvanized.
         2) Open Area: 49 percent
         3) Load Rating: ASHTO M306. H-20 and HS-25 and FAA AC 150 5320-6D.
      g. Catch Basins: ECB1224: 12 x 32 x 24 inch (305 x 610 x 610 mm) inline catch basin assembly consisting of EPS former, Bolt-In-Place grate rail spacer bars, grate rail and grate., ECB2424: 24 x 24 x 24 inch (610 x 610 x 610 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2436: 24 x 24 x 36 inch (610 x 610 x 915 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., ECB2442: 24 x 24 x 42 inch (610 x 610 x 1067 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate., or ECB3360: 32.625 x 32.625 x up to 60 inch (828 x 828 x up to 1,524 mm) catch basin assembly consisting of EPS former, pre-welded grate frame and grate.
      h. Form Release: EconoDrain Form Release Part Number RA1G or RA5G.

## PART 3 EXECUTION

### 3.01 EXCAVATION AND FILL

A. Hand trim excavation for accurate placement to indicated elevations.

B. Backfill with cover fill, tamp in place and compact, then complete backfilling.

### 3.02 INSTALLATION

A. Establish elevations and pipe inverts for inlets and outlets as indicated in drawings.

B. Prefabricated Drop Inlets or Trench Drains:
   1. Place base section plumb and level.
   2. Install according to manufacturer's instructions.
   3. Secure installation brackets.

C. Frames and Grates:
   1. Place frame plumb and level.

2. Mount frame on prefabricated drop inlets or trench drains according to manufacturer's instructions.
3. Place grate in frame securely.

**END OF SECTION 33 42 30**

## SECTION 33 46 16
## HIGH DENSITY POLYETHYLENE PIPE

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Requirements for providing high density polyethylene pipe.

### 1.02 REFERENCES

A. ASTM F 405, Standard Specification for Corrugated Polyethylene Pipe and Fitting.

B. ASTM F 667, Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fitting.

C. AASHTO M 252, Standard Specification for Polyethylene Corrugated Drainage Pipe.

D. AASHTO M 294, Standard Specification for Corrugated Polyethylene Pipe, 12" to 36" diameter.

### 1.03 SUBMITTALS

A. Product Data: for each product indicated.

B. Shop drawings for high density polyethylene pipe shall conform with the provisions of the Section "Shop Drawings and Samples", Division 1.

### PART 2 PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

A. Pipe shall be N-12 as manufactured by Advanced Drainage Systems, Inc., Columbus, Ohio, or equal.

### 2.02 SYSTEM DESCRIPTION

A. High density polyethylene pipe shall be installed where shown on the Plans.

B. High density polyethylene pipe shall be designed for AASHTO H-20 loading.

C. High density polyethylene pipe and joints shall conform to AASHTO M294 and ASTM D 3350.

D. All high density polyethylene pipe shall have a smooth interior.

### PART 3 EXECUTION

### 3.01 HANDLING AND STORAGE

A. Handle pipe and fitting with care to prevent damage. Store pipe on flat surfaces so the barrels are evenly supported.

### 3.02 INSTALLATION

A. Pipe shall be installed in accordance with the manufacturer's recommendations.

B. Pipe bedding shall have a minimum thickness of 6" and shall be compacted to the density shown on the drawings. The bedding shall be shaped to have contact with the pipe for an angle of at least 90°.

C. Upon completion of placement of pipe embedment material, the material shall be compacted to the densities shown on the drawings. Contact between the pipe and the compaction equipment shall be avoided.

**END OF SECTION 33 46 16**