

PUTNAM VALLEY CENTRAL SCHOOL DISTRICT

171 Oscawana Lake Road, Putnam Valley, NY 10579

COVID-Related Capital Projects

SED No. 48-05-03-04-0-001-013
SED No. 48-05-03-04-0-007-002
SED No. 48-05-03-04-0-010-006
SED No. 48-05-03-04-5-012-003

Putnam Valley Elementary School
Putnam Valley Elementary School Modular
Putnam Valley High School
Putnam Valley Transportation Garage

ARCHITECT:

KG+D ARCHITECTS, PC
285 Main Street
Mount Kisco, NY 10549
www.kgdarchitects.com
914.666.5900

SYSTEMS ENGINEER:

BARILE GALLAGHER & ASSOCIATES
39 Marble Avenue
Pleasantville, NY 10570
www.bga-eng.com
914.328.6060

CONSTRUCTION DOCUMENTS:

June 24, 2022

THE UNDERSIGNED CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE, INFORMATION AND BELIEF, THE PLANS AND SPECIFICATIONS ARE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE, THE STATE ENERGY CONSERVATION CONSTRUCTION CODE, AND BUILDING STANDARDS OF THE EDUCATION DEPARTMENT, AND THAT THE PLANS AND SPECIFICATIONS REQUIRE THAT NO ASBESTOS CONTAINING MATERIAL SHALL BE USED.

Walter P. Hauser, AIA

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Project Manual/Specifications
for
Putnam Valley Central School District
COVID-Related Capital Projects

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The Putnam Valley Central School District will receive individual sealed bid proposals before **11:00 AM on July 26, 2022 for:**

**COVID-RELATED CAPITAL PROJECTS
AT
PUTNAM VALLEY ELEMENTARY SCHOOL
PUTNAM VALLEY ELEMENTARY SCHOOL MODULAR BUILDING
PUTNAM VALLEY HIGH SCHOOL
PUTNAM VALLEY TRANSPORTATION FACILITY**

Bid No. 2022-23-07

The District will receive the proposals at the Business Office, 171 Oscawana Lake Road, Putnam Valley, NY, 10579, and at that time and place any and all such proposals that have been received in accordance with the terms hereof will be publicly opened and read aloud.

The District invites bidders to bid on the work described in the Bid Documents that falls within the following bid packages:

Bid Package #	Trade
GC	General Construction (Single Prime Contract)

See the Bid Documents for a further description of the scope of work.

Bidders must use the Bid Proposal Forms included with the Bid Documents in order to make their proposals, and each proposal must be made in accordance with those Forms.

Bidders may obtain the Bid Documents **after 3:00 PM on June 27, 2022**, from REVplans, 28 Church Street, Unit 7, Warwick, NY, 10990, (877) 272-0216. Complete digital sets of Bidding Documents, drawings and specifications, may be obtained online as a download at the following website: www.usinglesspaper.com under 'public projects.' Complete hard copy sets of Bidding Documents, drawings, and specifications, may be obtained from REV upon depositing the sum of **\$50.00** for each combined set of documents. Checks or money orders shall be made payable to *"Putnam Valley Central School District."* The full deposit will be refunded to bidders upon return of the Bid Documents in acceptable condition within one week of notification of award by the District as per NYS General Municipal Law Article 5A, Section 102. Bidders are to submit a written request for plan deposit refund which is to be accompanied by a copy of the canceled check or District issued receipt. Upon receipt of request, the Business Office will generate a refund on the next available check run. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.

Please note Rev (www.usinglesspaper.com) is the designated location and means for distributing and obtaining all bid package information. All bidders are urged to register to ensure receipt of all necessary information, including bid addenda.

There will be a pre-bid site meeting **on July 13, 2022 at 3:00 PM at beginning at Putnam Valley High School, 146 Peekskill Hollow Road, Putnam Valley, NY 10579**, outside the Main Entrance. After that, the meeting will proceed to **Putnam Valley Elementary School**.

Bidders are urged to attend the site meeting. Knowledge of the field conditions is crucial to understanding the Work.

Each proposal must be accompanied by a certified check payable to the *Putnam Valley Central School District* or by a Bid Bond for a sum equal to five percent (5%) of the bid, conditioned as set forth in the Instructions to Bidders. All bid security, except those of the three low bidders will be returned within four days after proposals are submitted. The bid security provided by the three low bidders will be returned after the execution of the Trade Contract.

The District will require the successful bidder to provide separate Performance and Labor & Materials Payment Bonds in the amount of the contract price and in the form specified in the Bid Documents.

To the fullest extent allowed by law, the District reserves the right to reject bids that contain omissions, exceptions, or modifications, or in their sole discretion to waive such irregularities, or to reject any or all bids or to accept any bid which is in the best interest of the District.

All laborers, workers, and mechanics working on the site of this project must be certified as having successfully completed the OSHA 10-hour construction safety & health course.

All Requests for Information shall be sent in writing to KG+D Architects care of Sarah Davis, AIA, via email at sdavis@kgdarchitects.com.

All proposals shall be sealed in an opaque envelope distinctly marked on the outside as follows:

**Putnam Valley Central School District
COVID-Related Capital Projects
Bid Opening Date:
Name of Bidder
Bid Package
"SEALED BID"**

Such proposals must be delivered to **Jill Figarella, District Treasurer**, or her designee, **no later than the appointed time on the bid opening date, at the Business Office, 171 Oscawana Lake Road, Putnam Valley, NY, 10579 (bids will be opened in the Elementary School building at the same address)**. The District will not open or consider any proposal unless it is received at that location by no later than the appointed time on the bid opening date, on the bid opening date. Bidders are solely responsible for the arrival of each bid proposal at the place of bid opening by the appointed time, regardless of the means of delivery.

END OF ADVERTISEMENT

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SECTION 00 21 00

CONTRACT REQUIREMENTS AND BID PROPOSAL FORMS

PART 1 - INVITATION & INSTRUCTIONS

Project: COVID-Related Capital Projects

Project Location: Putnam Valley Elementary School, ES Modular Building &
Transportation Building
171 Oscawana Lake Road, Putnam Valley, NY 10579

Putnam Valley High School
146 Peekskill Hollow Road, Putnam Valley, NY 10579

Owner: Putnam Valley CSD
171 Oscawana Lake Road, Putnam Valley, NY 10579
Contact: David Spittal, Director of Facilities

Architect: KG+D Architects, PC
285 Main Street, Mount Kisco, NY 10549
Attn: Walter P. Hauser, AIA
914.666.5900 x252
whauser@kgdarchitects.com

Bid proposals must be submitted on the attached form with all blanks filled in. They are to be submitted in sealed envelopes bearing on the outside, the name and address of the bidder, the title of the Project as noted above, and the opening date and time. Failure to fully complete the form or follow the instructions may result in disqualification.

A pre-bid inspection is scheduled for **July 13, 2022, at 3:00 PM**. Contractors shall meet at the *Putnam Valley High School main entrance, 146 Peekskill Hollow Road, Putnam Valley, NY 10579*. Reasonable knowledge of the site and conditions is the contractor's responsibility and is understood as agreed to by the contractor by submitting a bid proposal. Questions as a result of such inspection, or of the documents, should be submitted in writing to the office of the Architect as listed above.

The Owner reserves the right to waive, or refuse to waive, any proposal informalities.

Submitted bids shall remain irrevocable for a period of forty-five days.

Proposals are to be submitted to the office of the Owner at the address listed above prior to **11:00 AM, on July 26, 2022**.

The Non-Collusive Certification and the Indemnification and Hold Harmless Clause on the bid proposal form must be signed, as well as one of the two Iran Divestment Act Certifications for a bid proposal to be considered complete.

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PART 2 – BID PROPOSAL FORM

Putnam Valley COVID-Related Capital Projects

Name: _____

Street Address: _____

Municipality / State / Zip Code: _____

Telephone / Email: _____

Contact Person (printed name and title): _____

The undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number

Date of Addendum

Single Prime Base Bid:

All work shown in the drawings with the exception of alternates listed below:

The total amount for the work is:

_____ and 00/100 DOLLARS (\$_____.00)
(Written in Words) (Written in Numerals)

Authorized Signature: _____
(Print Name/Title) (Sign)

Alternates:

ALTERNATE NO. 1: All Work at the Transportation Building

ADD _____ Dollars (\$_____)
(Written in Words)

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NON-COLLUSIVE AFFADAVIT

By submission of this proposal each proposer and each person signing on behalf of any proposer certifies, and in the case of a joint proposal 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 proposal 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 proposer or with any competitor;
2. Unless otherwise required by law, the prices quoted in this proposal have not been knowingly disclosed by the proposer and will not knowingly be disclosed by the proposer prior to the opening, directly or indirectly, to any other proposer or to any competitor; and
3. No attempt has been made or will be made by the proposer to induce any other person, partnership or corporation to submit or not to submit a proposal for the purpose of restricting competition.

I, herby affirm under the penalties of perjury that the foregoing statement is true.

Dated: _____ Signed _____

(Print Name)

(Title)

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INDEMNIFICATION AND HOLD HARMLESS CLAUSE

Contractor Agrees to indemnify and save harmless the Owner, and any of their agents, assigns, employees or independent contractors, the Architect and persons in his employ, from any and all liability for damages for injury to the person or property of another and from all suits and actions and all costs and damages to which such parties may be subjected resulting from the Contractor's performance of this contract, whether such performance be by the Contractor, or by any Subcontractor or employee.

I certify that I have been duly authorized to execute this Agreement on behalf of:

(Name of Contractor/Company)

Dated: _____ Signed _____

(Print Name)

(Print Title)

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CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

As a result of the Iran Divestment Act of 2012 (the "Act"), Chapter 1 of the 2012 Laws of New York, a new provision has been added to State Finance Law (SFL) § 165-a and New York General Municipal Law § 103-g, both effective April 12, 2012. Under the Act, the Commissioner of the Office of General Services (OGS) will be developing a list of "persons" who are engaged in "investment activities in Iran" (both are defined terms in the law) (the "Prohibited Entities List"). 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, each Bidder/Contractor, any person signing on behalf of any Bidder/Contractor and any assignee or subcontractor and, in the case of a joint bid, each party thereto, certifies, under penalty of perjury, that once the Prohibited Entities List is posted on the OGS website, that to the best of its knowledge and belief, that each Bidder/Contractor and any subcontractor or assignee is not identified on the Prohibited Entities List created pursuant to SFL § 165-a(3)(b).

Additionally, Bidder/Contractor is advised that once the Prohibited Entities List is posted on the OGS Website, any Bidder/Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to this 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 School District receive information that a Bidder/Contractor is in violation of the above-referenced certification, the School District will offer the person or entity an opportunity to respond. If the person or entity fails to demonstrate that he/she/it has ceased engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then the School District shall take such action as may be appropriate including, but not limited to, imposing sanctions, seeking compliance, recovering damages or declaring the Bidder/Contractor in default. The School District reserves the right to reject any bid or request for assignment for a Bidder/Contractor that appears on the Prohibited Entities List prior to the award of a contract and to pursue a responsibility review with respect to any Bidder/Contractor that is awarded a contract and subsequently appears on the Prohibited Entities List.

I, _____, being duly sworn, deposes and says
that he/she is the _____ of the
_____ Corporation and that neither the Bidder/ Contractor
nor any proposed subcontractor is identified on the Prohibited Entities List.

SIGNED

SWORN to before me this _____ day of _____ 20____

Notary Public: _____

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OR

**DECLARATION OF BIDDER'S INABILITY TO PROVIDE CERTIFICATION OF COMPLIANCE
WITH THE IRAN DIVESTMENT ACT**

Bidders shall complete this form if they cannot certify that the bidder /contractor or any proposed subcontractor is not identified on the Prohibited Entities List. The District reserves the right to undertake any investigation into the information provided herein or to request additional information from the bidder.

Name of the Bidder: _____

Address of Bidder _____

Has bidder been involved in investment activities in Iran? _____

Describe the type of activities including but not limited to the amounts and the nature of the investments (e.g. banking, energy, real estate):

If so, when did the first investment activity occur? _____

Have the investment activities ended? _____

If so, what was the date of the last investment activity? _____

If not, have the investment activities increased or expanded since April 12, 2012?

Has the bidder adopted, publicized, or implemented a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran?

If so, provide the date of the adoption of the plan by the bidder and proof of the adopted resolution, if any and a copy of the formal plan. _____

In detail, state the reasons why the bidder cannot provide the Certification of Compliance with the Iran Divestment Act below (additional pages may be attached):

I, _____ being duly sworn, deposes and says that he/she is the
_____ of the _____ Corporation and the
foregoing is true and accurate.

SIGNED

SWORN to before me this _____ day of _____ 20____

Notary Public: _____

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PART 3 – CONTRACT REQUIREMENTS & GENERAL CONDITIONS

A. Contract

By submission of a proposal, the Contractor agrees to enter into a contract with the Owner within 30 days of the submission of the bid. The form of Contract and General Conditions is included in this project manual.

B. Insurance Requirements

If awarded the job, the bidder agrees to obtain policies of insurance for the following coverages in the amounts listed, upon which the Owner, "KG+D Architects, P.C." and consultants are named as "additional insured."

The contractor shall provide adequate proof of coverage within seven (7) calendar days of receipt of the notice of award (and to proceed) of the contract by the Board of Education. Failure to provide such proof may void the proposal.

The successful proposer, at its sole cost and expense, shall provide the Owner with the following insurance coverage whether the operations to be covered thereby are through the successful bidder or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

1. Self-Insurance Retention – not greater than \$25,000.
2. Builders Risk Insurance may be provided by the Owner to cover cost of all changes, alterations or modifications.
3. Cancellation Notice - All insurance certificates shall state that the policy will not be canceled nor coverage thereunder be reduced or limited without thirty (30) days prior written notice to the Owner. It shall further state that a similar thirty (30) days prior written notice will be given to the Owner prior to the expiration of the policy if renewal coverage is to be refused or such coverage is to be reduced on renewal. Such certificates shall show the name and address of the insured successful bidder, the policy number, the type of coverage, the inception and expiration dates, and it shall clearly state what, if any, coverages are excluded by endorsement or otherwise excepting such as appear in the standard printed policy itself. The Owner reserves the right to make direct inquiry to the insurance carrier for an explanation of coverages and the successful bidder agrees to assist in obtaining any such desired information.

4. Insurance Coverage Requirements: **Refer to Section 007002 Insurance Rider**

C. Bid Bond

All bids must be accompanied by a Bid Bond in the amount of 5 percent of the Contract Sum drawn by a recognized surety authorized to conduct business in the State of New York and made payable to the Owner. Bid security will be returned to all except the three lowest bidders, after formal analysis and evaluation of bids. No bid will be withheld beyond the forty-five (45) day period stipulated above. Remaining bid security will be

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returned to bidders after Owner and successful bidder have executed the Agreement and the Owner has received and approved performance and payment bonds.

D. Performance and Payment Bonds

Separate Performance and Payment Bonds will be required for the work. Each shall be in the amount of 100% of the Contract price.

E. Qualifications

Entities submitting proposals are to be experienced in the work of this project and must provide complete information on three representative projects, which can be viewed by the Owner, including being within 30 miles of the project site.

F. Prevailing Wage

Refer to Section 00 46 43 Wage and Hour Rates.

Contractors and subcontractors must submit Certified Payroll and Waiver of Liens with each application for payment.

G. Submittals

Provide complete submittals of all materials and assemblies to be utilized in the project. These are to be approved by the Owner and or Architect prior to ordering materials. Requirements for the submittal process will be discussed at the initial project meeting, however no asbestos or lead containing materials will be used or brought on the Owner's site.

All project submittals are due within 45 days of notice to proceed (NTP).

H. Equivalency Clause

As per the requirements of the State Education Department and New York State Law approved equivalent products will be reviewed by the Owner and or Architect and if they meet the performance criteria of the specified products, they will be deemed acceptable.

Any materials, articles or equipment of other manufacturers and vendors which performs the same duties imposed by the general design may be considered equally acceptable provided that the material, article or equipment so proposed is of equal quality, substance and function. It is the responsibility of the Contractor to show that the proposed substitution is equal. It is the responsibility of the Contractor to identify any substitutions and to provide a point-by-point comparison and backup, such that a reasonable review can be made. The Contractor shall not provide, or install any such proposed material, article or equipment without prior written approval.

I. Existing Conditions / Field Verification

The Contractor shall familiarize themselves with the existing conditions, verify necessary field conditions to prepare an accurate proposal, perform all required measurements for the fabrication and installation of work, and assume complete responsibility for the accuracy of same.

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J. Scope

This project involves installation of a water treatment system at Putnam Valley Elementary School.

K. Special Requirements

Special Project Requirements - Contractor at all times will comply with the full requirements of 8 NYCRR Section 155.5 as they address "General Safety and Security Standards for Construction Projects."

The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy.

A complete copy of 155.5 may be obtained at the State Education Department web site, <http://www.emsc.nysed.gov/facplan> or at the office of the architect.

Specifically, contractors must take special note of the requirements for NO SMOKING, separation of construction from students and staff, and worker picture identification being worn at all times. Contractor will check in with the Owner representative at the beginning and end of each work period. Hours of work and noise control must comply with the local municipal requirements. No work under this contract will be done while the school is occupied.

Further explanations of special requirements are listed below:

1. General safety and security standards for construction projects are as follows:
 - a) All construction materials shall be stored in a safe and secure manner.
 - b) Fences around construction supplies or debris shall be maintained.
 - c) Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.
 - d) Workers shall be required to wear photo-identification badges at all times for identification and security purposes while working at occupied sites."

2. Separation of construction areas from occupied spaces:

Construction areas which are under the control of a contractor and therefore not occupied by district staff or students shall be separated from occupied areas. Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the building. Periodic inspection and repairs of the containment barriers must be made to prevent exposure to dust or contaminants. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.

- a) A specific stairwell and/or elevator should be assigned for construction worker use during work hours. In general, workers may not use corridors, stairs or elevators designated for students or school staff.

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- b) Large amounts of debris must be removed by using enclosed chutes or a similar sealed system. There shall be no movement of debris through halls of occupied spaces of the building. No material shall be dropped or thrown outside the walls of the building.
- c) All occupied parts of the building affected by renovation activity shall be cleaned at the close of each workday. School buildings occupied during a construction project shall maintain required health, safety and educational capabilities at all times that classes are in session."
- d) The contractor shall be responsible for the control of chemical fumes, gases, and other contaminants to ensure they do not enter occupied portions of the building or air intakes.
- e) The contractor shall be responsible to ensure that activities and materials which result in "off-gassing" of volatile organic compounds such as glues, paints, furniture, carpeting, wall covering, drapery, etc. are scheduled, cured or ventilated in accordance with manufacturers' recommendations before a space can be occupied.
- f) A plan detailing how exiting required by the applicable building code will be maintained. Existing exits from occupied portions of buildings must be continuously maintained or alternative exits provided.
- g) Existing fire safety systems, such as fire alarms and exit and emergency lights, must be continuously maintained or provisions made to provide equivalent safety. In addition, the fire department must be notified of any non-operating systems.
- h) Provide and follow a plan detailing how adequate ventilation will be maintained during construction.
- i) Develop and maintain a noise abatement program and enforce strict discipline over all personnel to keep noise to a minimum.
 - 1. Equipment and work shall not produce noise in excess of 60db in occupied areas or shall be scheduled for off hours or acoustical abatement procedures shall be taken. Noise level measurements (dba) shall be taken with a type 2 sound level meter in the occupied space in a location closest to the source of the noise.
 - 2. Execute construction work by methods and by use of equipment which will reduce excess noise.
 - 3. Equip air compressors with silencers, and power equipment with mufflers.

General Requirements – Contractor to provide all support and general requirements as needed to complete their own work and to avoid impacting the Owner's operations. The contractor may obtain temporary water and 120volt power from the building, subject to cancellation if abused.

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SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District
COVID-Related Capital Projects
Elementary School Outdoor Classrooms
Elementary School Modular Building Alterations
High School Exterior Courtyard Alterations
Transportation Building Alterations

L. Construction Procedures

The Contractor is to review all on-site construction operations including staging areas, worker parking, delivery access, dumpster location, work hours and schedules with the Owner / Architect prior to proceeding. All on-site operations are to fully comply with Section 155.5.

M. Asbestos Abatement

Previous testing performed by the Owner has indicated Asbestos will not be encountered during this project. However:

Large and small asbestos abatement projects as defined by 12NYCRR56 shall not be performed while the building is occupied. If abatement is required, a copy of the current NYS Department of Labor License (with picture) bearing the designation "I" for Asbestos Project Designer and indicating expiration date must be submitted. The Asbestos Designer must also be a NYS Licensed Architect or Engineer.

It is the interpretation of the New York State Education Department that the term "building", as referenced in this section, means a wing or major section of a building that can be completely isolated from the rest of the building with sealed noncombustible construction. The isolated portion of the building must contain exits that do not pass through the occupied portion and ventilation systems must be physically separated and sealed at the isolation barrier.

N. Lead Abatement / Lead Paint / PCBs

Previous testing performed by the Owner has indicated lead paint will not be encountered during this project. However:

All areas scheduled for construction as well as areas of flaking and peeling paint shall be tested for the presence of lead and abated or encapsulated in accordance with the following guidelines:

Any construction or maintenance operations which will disturb lead-based paint shall be abated pursuant to protocols detailed in the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" (June 1995; U.S. Department of Housing and Urban Development, Washington, DC 20410; available at the New York State Education Department Office of Facilities Planning, 89 Washington Avenue, Room 1060 EBA, Albany, NY 12234).

In the event undocumented lead-based paint is discovered during the work, the Contractor shall immediately notify the Architect/Engineer and/or Owner for instructions as to procedures to be taken.

PCBs are regulated by the U.S. Environmental Protection Agency (U.S. EPA) and the State of New York. PCBs may be present in building caulk or in the soil near caulked structures in typical locations such as windows and expansion joints. If it is determined that caulking materials and/or soil contain PCBs, a site-specific abatement plan should be developed to address potential environmental and public health concerns. The HUD Technical Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in

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Housing available at www.hud.gov/offices/lead/guidelines/hudguidelines/ can be used as a basis for developing the steps for abating the contamination and preventing contamination of nearby areas.

This is the same guideline required by NYSED to manage lead contaminated materials in schools under the RESCUE regulations. Caulking materials that contain either lead, PCBs, or both can therefore be managed under the same guidance. Caulking materials that contain asbestos in addition to either lead or PCBs or samples that contain only asbestos will be managed in accordance with requirements of the NYS Department of Labor Code Rule 56.

O. Milestone Schedule & Work Hours

The Contractor shall develop a construction schedule inclusive of the following tasks and milestones.

Award / notice to proceed (NTP): No later than 45 days after proposals due

Provision of all Submittals: No later than 45 days after NTP

Substantial Completion: 01 August 2023

The project site is an occupied building and all work shall occur second shift, weekend, and during school closures. No work will be permitted during hours of school operation.

The Contractor must submit an updated schedule with each application for payment.

P. Cleaning

The Contractor is to protect all adjacent areas while installation is underway and is to fully clean all disturbed areas and remove all debris and materials that are not claimed by the Owner. Throughout the construction the site is to be kept neat and orderly.

Q. Close out Procedures

The contractor is to notify the Owner and Architect when the installation is complete including any remaining work or close out items. At that time the Architect will provide a punch list with valuation. The contractor then may requisition their full contract, without retainage, but less 200% of the value of the punch list, which will be the final payment. After receipt of the punch list from the Architect, the contractor is to promptly remedy all items but not later than three weeks after the receipt of the punch list. Once this is complete and close out documents and warranties have been submitted, the contractor will receive final payment. In addition to material warranties, the contractor shall provide a one year full labor and material warranty from the time of completion of the punch list work.

End of Section

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SECTION 00 46 43

WAGE AND HOUR RATES

1.01 GENERAL

- A. The following are instructions for obtaining the minimum wage rates, health and welfare and pension fund contributions as determined by the Industrial Commissioner of the State of New York in accordance with the provisions of Section 220 of the Labor Law.
- B. All contractors will be bound and obligated by the Laws of New York State to ensure payment to all workers involved with the construction of the Project.

1.02 MINIMUM WAGE RATES

- A. The current wage and benefit rates are available when following the instructions on the attached page.

The "Request for Wage and Supplement Information" (PW 39) you have submitted has been accepted, and a Prevailing Rate Case Number (PRC# 2022003712 - PVCSD COVID-Related Cap. Proj.) has been assigned to the project.

To access the PDF file of your schedule, click on
<https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1530254> or copy
and paste into your browser

Prevailing Wage

[Home](#) > Prevailing Wage

[Wage Schedule](#) · [Submit Notice Of Award](#) · [Submit Notice Of Project Completion](#)

PRC#: 2022003712

Type of Contracting Agency: Local School District

Acceptance Status: Accepted Article 8

Contracting Agency

Putnam Valley CSD
Jill Figarella
District Treasurer
171 Oscawana Lake Road
Putnam Valley NY 10579

(845) 528-8143
jfigarella@pvcasd.org

Send Reply To

Walter Hauser

KG+D Architects, PC
285 Main Street
Mount Kisco NY 10549

(914) 666 -5900
sannar@kgdarchitects.com

Project Information

Project Title	PVCSD COVID-Related Cap. Proj.
Description of Work	Limited interior and site alterations for ES outdoor classroom, HS courtyard seating area, transportation garage security partitions, and ES modular upgrades.
Contract Id No.	2021-1067
Project Locations(s)	Multiple
Route No / Street Address	171 Oscawana Lake Road
Village / City	146 Peekskill Hollow Road
Town	Putnam Valley
State / Zip	NY 10579
Nature of Project	Other Reconstruction, Maintenance, Repair or Alteration
Approximate Bid Date	05/30/2022
Checked Occupation(s)	Construction (Building, Heavy & Highway, Sewer, Water, Tunnel)

Applicable Counties

Putnam

Department of Labor

Accessibility

Contact

Language Access

Privacy Policy





AIA[®] Document A104[™] – 2017

Standard Abbreviated Form of Agreement Between Owner and Contractor

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)

Putnam Valley Central School District
146 Peekskill Hollow Road
Putnam Valley, NY 10579
Phone: 845.528.8143

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

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

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

KG+D Architects, PC
285 Main Street
Mount Kisco, NY 10549
Phone: 914.666.5900

The Owner and Contractor agree as follows.

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.

TABLE OF ARTICLES

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EXHIBIT A DETERMINATION OF THE COST OF THE WORK

ARTICLE 1 THE WORK OF THIS CONTRACT

The Contractor shall execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

☒ The date of this Agreement.

(Paragraphs deleted)

Init.

/

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 2.2 The Contract Time shall be measured from the date of commencement.

§ 2.3 Substantial Completion

§ 2.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check the appropriate box and complete the necessary information.)

☒ By the following date:

Final Completion Date: August 23, 2019

§ 2.3.2 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
NA	

§ 2.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 2.3, liquidated damages, if any, shall be assessed as set forth in Section 3.5.

ARTICLE 3 CONTRACT SUM

§ 3.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:

(Check the appropriate box.)

☒ Stipulated Sum, in accordance with Section 3.2 below

(Paragraphs deleted)

(Based on the selection above, complete Section 3.2, 3.3 or 3.4 below.)

§ 3.2 The Stipulated Sum shall be Dollars and xx/100 Cents (\$.00), subject to additions and deductions as provided in the Contract Documents.

§ 3.2.1 The Stipulated Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 3.2.2 Unit prices, if any:

(Identify the item and state the unit price and the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 3.2.3 Allowances, if any, included in the stipulated sum:

(Identify each allowance.)

Item

Price

§ 3.3 Cost of the Work Plus Contractor's Fee – NOT USED

(Paragraphs deleted)

§ 3.4 Cost of the Work Plus Contractor's Fee With a Guaranteed Maximum Price – NOT USED

§ 3.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

ARTICLE 4 PAYMENT

§ 4.1 Progress Payments

§ 4.1.1 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.

§ 4.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 4.1.3 Provided that an Application for Payment is received by the Architect not later than the FIFTEENTH (15th) day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the TENTH (10th) day of the Next month. If an Application for Payment is received by the Architect after the date fixed above, payment 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.)

§ 4.1.4 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold retainage from the payment otherwise due as follows:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment and any terms for reduction of retainage during the course of the Work. The amount of retainage may be limited by governing law.)

Five percent (5%), no reduction

§ 4.1.5 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.

(Paragraphs deleted)

§ 4.2 Final Payment

§ 4.2.1 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 Section 18.2, and to satisfy other requirements, if any, which extend beyond final payment;
- .2 the Contractor has submitted a final accounting for the Cost of the Work, where payment is on the basis of the Cost of the Work with or without a Guaranteed Maximum Price; and
- .3 a final Certificate for Payment has been issued by the Architect in accordance with Section 15.7.1.

§ 4.2.2 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.

ARTICLE 5 DISPUTE RESOLUTION

§ 5.1 Binding Dispute Resolution

For any claim subject to, but not resolved by, mediation pursuant to Section 21.5, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

Init.

[X] Litigation in a court of competent jurisdiction
(Paragraphs deleted)
in the domicile of the Owner

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 in a court of competent jurisdiction.

ARTICLE 6 ENUMERATION OF CONTRACT DOCUMENTS

§ 6.1 The Contract Documents are defined in Article 7 and, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 6.1.1 The Agreement is this executed AIA Document A104™–2017, Standard Abbreviated Form of Agreement Between Owner and Contractor.

§ 6.1.2 - NOT USED
(Paragraph deleted)

§ 6.1.3 The Supplementary and other Conditions of the Contract: NA

(Table deleted)

§ 6.1.4 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Bid Issue Specifications dated TBD – Cover and Index attached
(Table deleted)

§ 6.1.5 The Drawings:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Bid Issue Drawings dated TBD– Title Sheet attached
(Table deleted)

§ 6.1.6 The 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 enumerated in this Article 6.

§ 6.1.7 Additional documents, if any, forming part of the Contract Documents:

(Paragraphs deleted)

Putnam Valley Central School District Contractor Insurance Agreement

ARTICLE 7 GENERAL PROVISIONS

§ 7.1 The Contract Documents

The Contract Documents are enumerated in Article 6 and consist of this Agreement (including, if applicable, Supplementary and other Conditions of the Contract), Drawings, Specifications, Addenda issued prior to the execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement. 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. 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 to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

No obligation of the Architect to the Owner, whether expressed by agreement or implied by law, shall be construed as intended for the benefit of the Contractor. Nothing in the Contract Documents nor in any aspect of the Architect's relationship with the Owner shall create or give rise to any duty whatsoever on the part of the Architect to the Contractor. The term "Contractor" in this paragraph shall include the Contractor, its officers, employees, agents, contractees and Subcontractors of any tier; coordinate with Article 9.15 of this Document.

§ 7.1.1 In the event of any conflict among the Contract Documents, the Contractor shall notify the Owner and the Architect of same and follow and comply with their interpretation of same. In the event that the Owner and Architect fail to respond to the Contractor's notification within a reasonable period of time, then the Documents shall be construed according to the following priorities:

Highest Priority:	Modifications issued after execution of the Agreement
Second Priority:	Agreement between Owner and Contractor
Third Priority:	Addenda issued prior to the execution of the Agreement later date to take precedence
Fourth Priority:	Special Project Requirements (if any)
Fifth Priority:	Additional Conditions
Sixth Priority:	Supplementary General Conditions
Seventh Priority:	General Conditions
Eighth Priority:	The Technical Specifications including Division #1
Ninth Priority:	The Conformed Construction Drawings

The terms and conditions of this Paragraph 7.1.1, however, shall not relieve the Contractor of any other obligations set forth in this Contract and Conditions Document

Among drawings, large scale details shall control over small scale details and figured dimensions shall control over Drawings not dimensioned.

Before ordering any materials or doing any Work, each Contractor and Subcontractor shall verify measurements at the Project site and shall be responsible for the correctness of such measurements. No extra charges or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference which may be found shall be submitted to the Architect for resolution before proceeding with the Work.

If a minor change in the Work is found necessary due to actual field conditions, the affected Subcontractor drawings of such departure to the Contractor for the approval of the Architect before making the change.

§ 7.2 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 between any persons or entities other than the Owner and the Contractor.

§ 7.3 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.

§ 7.4 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.

§ 7.5 Ownership and use of Drawings, Specifications and Other Instruments of Service

§ 7.5.1 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 will 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.

§ 7.5.2 The Contractor, Subcontractors, Sub-subcontractors and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to the protocols established pursuant to Sections 7.6 and 7.7, 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 this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 7.6 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 7.7 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

§ 7.8 Severability

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.

§ 7.9 Notice

§ 7.9.1 Except as otherwise provided in Section 7.9.2, 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 in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering Notice in electronic format such as name, title and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 7.9.2 Notice of Claims 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.

§ 7.10 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 7.11 ADDITIONAL DEFINITIONS

§7.11.1 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 or by separate contractors and as may be defined in Section 01010/01 10 00.

§7.11.2 THE PROJECT MANUAL - The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

§7.11.3 ADDENDUM: A change to the Contract Documents issued by Architect with Owner's approval prior to the execution of the Agreement and specifically listed in the Agreement.

§7.11.4 ALTERNATE: A variation in Contract requirements on which a separate price is to be received by the Owner as a part of the bid. If the Alternate is accepted in writing by the Owner, the variation is then a part of the Contract and the amount of money quoted to be added or deducted from the Base Bid is taken into account in determining the Contract Sum.

§7.11.5 PROVIDE: The Term "provide" shall mean furnish and install complete and ready for safe and regular use and/or operation of the item, material or service indicated.

§7.11.6 INDICATED AND SHOWN: Shall mean as detailed, scheduled, or called for in the Contract Documents.

§7.11.7 BULLETINS: Bulletins are written or graphic instruments issued by the Architect after the execution of the Contract which modify or interpret the bidding documents, including the Drawings and Specifications, by additions, deletions, clarifications or corrections.

§7.11.8 The terms "KNOWLEDGE," "RECOGNIZE" and "DISCOVER", their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill, and diligence required by the Contract Documents. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill and diligence required of the Contractor by the Contract Documents.

§ 7.11.9 The phrase "PERSISTENTLY FAILS" and other similar expressions, as used in reference to the Contractor, shall be interpreted to mean any combination of acts and omissions, which causes the Owner or Architect to reasonably conclude that the Contractor will not complete the Work within the Contract Time, for the Contract Sum or in substantial compliance with the requirements of the Contract Documents.

§ 7.11.10 - Wherever required by the context, any gender shall include the other gender, the singular shall include the plural, and the plural shall include the singular. Each defined term herein may be used in its singular or plural form whether or not so defined.

§ 7.12 CONFIDENTIALITY/PUBLIC COMMUNICATIONS AND USE AND DISCLOSURE OF PROJECT INFORMATION

Any public communications or disclosure of materials or information with respect to the Project by the Contractor and their employees and Subcontractors related to this engagement, except as required by law, shall be subject to the Owner's prior written approval, including, without limitation, any promotional, marketing, media or other material or information related to the Owner or the Project. The Contractor and its employees and Subcontractors hereby agrees to indemnify and hold the Owner harmless from and against any cost, damage, liability, loss or claim arising from violation of the foregoing. The Contractor shall specifically cause all Subcontractors or any other persons for entities performing any services, or furnishing any materials or equipment, for the Work to warrant and represent all items set forth in this Paragraph. The representation and warranty contained in this Paragraph shall survive the complete performance of the Work or earlier termination of this Agreement.

§ 7.13 Nothing in the Contract Documents shall relieve any Contractor from compliance with any statutory requirement, including those contained in New York State Education Law §3813.

ARTICLE 8 OWNER

§ 8.1 Information and Services Required of the Owner

§ 8.1.1 Prior to commencement of the Work, at the 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 8.1.1, the Contract Time shall be extended appropriately.

§ 8.1.2 The Owner shall furnish all necessary surveys and a legal description of the site.

§ 8.1.3 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.

§ 8.1.4 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 9.6.1, the Owner shall secure and pay for other necessary approvals, easements, assessments, and charges required for the construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.

§ 8.2 Owner's Right to Stop the Work

If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, or repeatedly fails to carry out the Work in accordance with the Contract Documents, or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to permit the Owner to reasonably infer that the Contractor will not be able to complete the Work within the Contract Time or fails to remove, bond or discharge (within thirty (30) days after actual notice or notice pursuant hereto from the Owner or the Architect) any lien filed upon Owner's property by anyone claiming by, through, or under Contractor, or disregards the instructions of Architect or Owner when based upon the requirements of 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 is 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.

§ 8.3 Owner's Right to Carry Out the Work

If the Contractor defaults or otherwise neglects to carry out the Work in accordance with the Contract Documents and fails within a three (3) day period after the effective date of notice from the Owner to commence to correct and thereafter diligently continue to correct such defaults or to otherwise properly carry out such Work, the Owner may give a second notice and, in the event that within three (3) days following the effective date of such second notice the Contractor continues to fail to commence to correct and thereafter diligently continue to correct such defaults or to otherwise properly carry out such Work, the Owner, without prejudice to other remedies the Owner may have, may correct such defaults and carry out such Work.

In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation of the Architect, and such Consultants whose participation is deemed necessary by the Owner or Architect, for additional services and expenses made necessary by such default, neglect or failure.

If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

8.4 OWNER'S RIGHT TO AUDIT

The Contractor shall keep full and accurate records of all costs incurred and items billed in connection with the performance of the Work, which records shall be open to audit by the Owner or its authorized representatives during performance of the Work and until three (3) years after Final Payment. In addition, the Contractor shall make it a condition of all subcontracts relating to the Work that any and all Subcontractors will keep accurate records of costs incurred and items billed in connection with their work and that such records shall be open to audit by the Owner or its authorized representatives during performance of the Work and until three (3) years after its completion.

§ 8.5 EXTENT OF OWNERS RIGHTS AND RESPONSIBILITIES

The rights stated in this Article 8 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (1) granted in the Contract Documents, (2) at law or (3) in equity. In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents

ARTICLE 9 CONTRACTOR

§ 9.1 Review of Contract Documents and Field Conditions by Contractor

§ 9.1.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

The Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation (1) the location, condition, layout and nature of the Project site and surrounding areas; (2) generally prevailing climatic conditions, (3) anticipated labor supply and costs, (4) availability and cost of materials, tools and equipment and (5) other similar issues. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any other improvements located on the Project site. Except as set forth in Article 16, the Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this paragraph 9.1.1.

§ 9.1.2 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 8.1.2, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the 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.

§ 9.1.3 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.

§ 9.2 Supervision and Construction Procedures

§ 9.2.1 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, unless the Contract Documents give other specific instructions concerning these matters.

The Contractor shall employ a competent full-time project superintendent and such necessary assistants who shall be in attendance at the Project site, during the progress of the Work to provide for the expeditious completion 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. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

Further, the superintendent shall not be changed except with the consent of the Owner or Architect, which consent shall not be unreasonably denied or delayed, unless the superintendent, or such assistant or assistants, proves to be

unsatisfactory to the individual Contractor and ceases to be in his employ; however the superintendent shall be changed upon request of the Owner, for good cause shown.

Where the Contract Documents refer to particular construction means, methods, techniques, sequences or procedures or indicate or imply that such are to be used in the Work, such reference is intended only to indicate that the operations of the Contractor shall be such as to produce at least the quality of work implied by the operations described, but the actual determination of whether or not the described operations may be safely and suitably employed on the Work shall be the sole responsibility of the Contractor.

§ 9.2.1.1 The Contractor shall, prior to start of any portion of the Work:

- .1 review any specified construction or installation procedures, including those as may be recommended by the proposed manufacturer(s);
- .2 advise the Architect, in writing if the specified procedure or procedures deviate from good construction practice;
- .3 advise the Architect, in writing if following said procedure or procedures will affect any warranty, including Contractor's general warranty;
- .4 advise the Architect, in writing of any objections the Contractor may have to the specified procedure or procedures;
- .5 propose to the Architect, in writing any alternative procedure or procedures which the Contractor will warrant.

§ 9.2.1.2 - Further, all loss, damage, or liability, or cost of correcting defective work unless, in compliance with Paragraph 9.2.1, Contractor gives timely written notice to the Owner and Architect that such means, methods, techniques, sequences or procedures may not be safe, arising from the employment of any construction means, methods, techniques, sequences or procedures shall be borne by the Contractor, notwithstanding that such construction means, methods, techniques, sequences or procedures are referred to, indicated or implied by the Contract Documents.

§ 9.2.2 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.

It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor. Nothing contained herein or inferable here from shall be deemed or construed to (1) make Contractor the agent, servant, or employee of the Owner, or (2) create any partnership, joint venture, or other association between Owner and Contractor. Any direction or instruction by Owner in respect of the Work shall relate to the results the Owner desires to obtain from the Work and shall in no way affect Contractor's independent contractor status as described herein.

§ 9.3 Labor and Materials

§ 9.3.1 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.

§ 9.3.2 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 skilled in tasks assigned to them. Should any disorderly, incompetent or objectionable person be hired or employed by the Contractor, upon or about the premises of the Owner, for any purpose or in any capacity, he/she shall, upon request of the Architect or Owner, be removed from the Project and not again assigned thereto without written permission of the Architect or Owner.

§ 9.3.3 The Contractor may make a substitution only with the consent of the Owner, after evaluation by the Architect and in accordance with a Modification and/or Change Order. Substitution requests shall be made in accordance with the requirements in the Contract Documents.

§ 9.4 Warranty

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new and of recent manufacture 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 under normal usage. All other 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 15.6.3.

§ 9.5 Taxes

The Contractor shall pay sales, consumer, use, and other similar taxes that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

The Owner, as identified on Page 1 of AIA 107, is a nonprofit, educational facility and is therefore "tax-exempt" in accordance with the applicable laws of the State of New York and with Chapter 32 of the Internal Revenue Code, as most recently amended, for collection of all sales and excise taxes. Exemption Certificates will be furnished, upon request, to the Contractor by the Owner, only for materials and supplies to be incorporated into Work under the terms of the Contract. There is no exemption from the sales or use tax on charges to the Contractor or subcontractor for lease of tools, machinery, equipment or other property used in conjunction with the Project. The Contractors and subcontractors shall be solely responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property, and for materials not incorporated in the Project, and the amount of such taxes, if any, shall be deemed included in the executed Base Bid.

§ 9.6 Permits, Fees, Notices, and Compliance with Laws

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

The Contractor, in securing other permits for construction or any other aspect of the Work associated with this project which requires a permit, notwithstanding language in the Agreement, shall at its own cost and expense, make the necessary arrangements to complete, file and have sealed by a Professional Engineer licensed in the jurisdiction, any and all preliminary affidavits of certification that may be required by the governing agency or agencies having jurisdiction for issuing permits for construction for this project which are legally required when bids are received or negotiations are concluded, but in any case, prior to starting construction.

Further, the Contractor shall, if required by ordinances, laws, codes, and rules and regulations of the governing agencies having jurisdiction over this project, retain a licensed Professional Engineer to supervise the construction of this project including, but not limited to - foundations, structural work, soils, welding, reinforced masonry, fireproofing, firestopping and the like, however this will not relieve the Design Professional Team from performing their contractual responsibilities.

§ 9.6.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor 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.

§ 9.7 Allowances

The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. The Owner shall select materials and equipment under allowances with reasonable promptness. Allowance amounts shall include the costs to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts. Contractor's costs for unloading and handling at the site, labor, installation, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowance.

§ 9.8 Contractor's Construction Schedules

§ 9.8.1 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 not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 9.8.2 The Contractor shall perform the Work in general accordance with the most recent schedule submitted to the Owner and Architect.

§ 9.9 Submittals

§ 9.9.1 The Contractor shall review for compliance with the Contract Documents and submit to the Architect Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents in coordination with the Contractor's construction schedule and in such sequence as to allow the Architect reasonable time for review. 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. The Work shall be in accordance with approved submittals.

NO Contractor shall submit any shop drawings that are merely tracings or other copies of any of the Contract Documents other than those produced as backgrounds using electronic (CAD) copies of work.

In the event that "cad" backgrounds are used, they shall be for identification purposes only and a separate drawing indicating actual information, techniques and the like shall be prepared.

Each shop drawing must be prepared by the Contractor, Subcontractor, Specialty Contractor, vendor or material person of the Contractor.

The Architect shall have the authority to reject any shop drawing violating any of the above provisions, and no extension of the Contract Time shall be given on account of such rejection.

§ 9.9.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents.

§ 9.9.3 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 or unless the Contractor needs to provide such services in order to carry out the Contractor's own responsibilities. If professional design services or certifications by a design professional are specifically required, the Owner and the Architect will specify the performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional. If no criteria are specified, the design shall comply with applicable codes and ordinances. Each Party shall be entitled to rely upon the information provided by the other Party. The Architect will review and approve or take other appropriate action on submittals for the limited purpose of checking for conformance with information provided and the design concept expressed in the Contract Documents. The Architect's review of Shop Drawings, Product Data, Samples, and similar submittals shall be for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. In performing such review, the Architect will approve, or take other appropriate action upon, the Contractor's Shop Drawings, Product Data, Samples, and similar submittals.

§ 9.10 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.

The right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times in The Owner. The Contractor's right to entry and use thereof arises solely from the permission granted by the Owner under the Contract Documents.

All Contractors shall confine their use of the premises, for all purposes, to the areas occupied by the construction and related storage areas as and if shown.

The Contractor shall provide all required temporary access walkways, both interior and exterior, temporary partitioning and the like necessary to complete the operations. Coordinate requirements and operations with Section 00 21 00 of the General Requirements. The Contractor shall maintain unobstructed entrance to and/or exit from the present building complex. All Contractor's work areas shall be kept clean each day of refuse including containers, cups and the like. THE ENTIRE FACILITY WILL REMAIN IN OPERATION DURING THE COURSE OF THE ENTIRE CONSTRUCTION OPERATIONS.

All contractors performing work on this contract shall schedule their work so as not to interfere with any traffic to and from the required areas of use. Contractor shall be responsible for maintaining all traffic and shall provide all required barriers and protection as required to safeguard the work and the public and the occupants of the building during Construction.

Contractors, their workmen, suppliers, etc., will be held to adhere strictly to the requirements hereinbefore stated and shall not occupy or carry on traffic through other parts of the site or interior of present buildings, except by specific permission from the Owner.

The Contractor shall repair or replace any existing trees, shrubbery or other planting damaged by operations and/or workmen employed in performance of their contract.

During the whole course of the Work, the Contractor shall conduct his work and operations as to interfere with traffic near the work as little as possible and effect by every reasonable means the safety and comfort of pedestrians, vehicles and vehicle passengers near the Work.

Employees, vehicles, equipment and material of all Contractors and of all others utilized by the Contractors' for the performance of their work shall enter onto the construction site only at those locations designated or approved by the Owner.

The Contractor shall properly maintain all access to work and storage areas so that there will be continuous unimpeded access to the work site in all seasons of the year, on all regular working days and during all regular working hours of any and all trades employed by any Contractor during work at the site.

Only such vehicles, trucks and equipment shall be parked or stored within the work area as are absolutely necessary for performing the work, for the length of time that a particular phase of work is performed. ALL OTHER CONTRACTOR' VEHICLES AND/OR EMPLOYEES' AND/OR WORKPERSON'S VEHICLES, INCLUDING PASSENGER CARS, SHALL BE PARKED OFF THE SITE.

Security - It will be the responsibility of the General Contractor to provide necessary and required security measures to adequately safeguard the construction site from vandalism and intrusion of unauthorized persons. The Contractor shall submit means and methods of security to the Owner, thru the Architect, for approval. The project site must be secured 24 hours a day, seven (7) days a week, including all holidays.

All workpersons and employees of any Contractor are prohibited from: Trespassing or leaving any vehicle on any property not assigned by the Owner as set aside for the use of the Contractor; leaving any vehicle on the grounds unless it is locked, and the ignition keys are removed.

All employees or persons entering upon the property surrounding the facilities affected by the construction are restricted to the immediate area of work. Only persons having official business will be admitted to the construction site.

§ 9.11 Cutting and Patching

The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

§ 9.12 Cleaning Up

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 material from and about the Project.

If cleanup is not performed in accordance herewith, the Owner will engage the services of a cleaning company each time the requirement is not met without further notification to the Contractor. The cost of such cleaning company, together with the cost of any custodial cost of the School District, will be divided among each Contractor who has failed to clean its debris.

The Contractor shall be responsible for broken glass, and at the completion of the Work shall replace such damaged or broken glass. After damaged or broken glass has been replaced, the Contractor shall remove all labels, wash and polish both sides of all glass. In addition to general broom cleaning, the Contractor shall perform the following final cleaning for all trades at completion of the Work.

- .1 Remove temporary protections;
- .2 Remove marks, stains, fingerprints and other soil or dirt from painted, decorated and natural finished woodwork and other Work;
- .3 Remove spots, soil and paint from ceramic tile, quarry tile, marble and other finished materials, and wash or wipe clean;
- .4 Clean fixtures, cabinet work and equipment, removing stains, paint, dirt and dust, and leave same in undamaged, new condition;
- .5 Clean aluminum in accordance with recommendations of the manufacturer; and
- .6 Clean all floors thoroughly in accordance with recommendations of the Manufacturer.

§ 9.13 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 9.14 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.

§ 9.15 Indemnification

§ 9.15.1 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. Such obligation shall be effective regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Notwithstanding any provision to the contrary in this section or anywhere else within this Agreement or otherwise in the Contract Documents, all of the indemnification and hold harmless agreements herein and therein are subject and subordinate to the limitations of the laws of the State of New York and in no event shall Contractor nor any other party be required to indemnify any person in violation of the provisions of the New York State General Obligations Law, sections 5-322.1 or 5-324, or of any other applicable law.

§ 9.15.2 In claims against any person or entity indemnified under this Section 9.15 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 9.15.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

§ 9.15.3 The Contractor's indemnity obligations under this Paragraph 9.15 shall, but not by way of limitation, specifically include all claims and judgments which may be made against the Owner, the Architect, their consultants,

and agents and employees of any of them under the New York State Labor Law, similar laws of other governmental bodies having jurisdiction, and further, against claims and judgments arising from violation of public ordinances and requirements of governing authorities due to the Contractor's or its Subcontractor's method of execution of the Work. Further, whenever any party to the Agreement is required, in words or substance, to indemnify or hold harmless another party, whether or not the following is expressly included in whole or in part in the paragraph with regard to such particular indemnification and hold harmless provision, such indemnification and hold harmless provision shall include, but not be limited to, the payment or reimbursement of all judgments, claims, damages, losses, fees, costs, and expenses, and litigation costs and expenses, including, but not limited to, the reasonable fees of its attorneys and witnesses.

ARTICLE 10 ARCHITECT

§ 10.1 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, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 10.2 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.

§ 10.3 The Architect will visit the site at intervals appropriate to the stage of the construction 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 safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 10.4 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.

§ 10.5 Based on the Architect's evaluations of the Work and 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.

§ 10.6 The Architect has authority to reject Work that does not conform to the Contract Documents and to require inspection or testing of the Work.

§ 10.7 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.

§ 10.8 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 will make initial decisions on all claims, disputes, and other matters in question between the Owner and Contractor but will not be liable for results of any interpretations or decisions rendered in good faith.

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

ARTICLE 11 SUBCONTRACTORS

§ 11.1 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 or to otherwise furnish labor, material or other services with respect to a portion of the Work, and includes, but is not limited to, Specialists, Specialty Contractor, and Trade Subcontractors. 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 subcontractors of a separate contractor.

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 or to otherwise furnish labor, material or other services with respect to a portion of the Work. 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.

The term 'Specialist' or 'Specialty Contractor' as used in these specifications shall mean an individual or firm of established reputation, or, if newly organized, whose personnel have previously established a reputation in the same field, which is regularly engaged in, and which maintains a regular force of workmen skilled in either manufacturing or fabricating items required by the Contract, installing items required by the Contract, or otherwise performing work required by the Contract.

Where the Contract Specifications require installation by a 'Specialist', that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform such work under the manufacturer's direct supervision. § 11.2 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 Subcontractors or suppliers proposed for each of the principal portions of the Work. The Contractor shall not contract with any Subcontractor or supplier to whom the Owner or Architect has made reasonable written objection within ten days after receipt of the Contractor's list of Subcontractors and suppliers. 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. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

(Paragraph deleted)

§ 11.3 Contracts between the Contractor and Subcontractors shall (1) require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the 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, which the Contractor, by the Contract Documents, assumes toward the Owner and Architect, and (2) allow the Subcontractor the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner.

ARTICLE 12 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 12.1 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.

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.

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 other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the 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.

§ 12.2 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 activities with theirs as required by the Contract Documents.

§ 12.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a Separate Contractor because of delays, improperly timed activities, or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work, or defective construction of a Separate Contractor.

ARTICLE 13 CHANGES IN THE WORK

§ 13.1 By appropriate Modification, changes in the Work may be accomplished after execution of the Contract. The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, with the Contract Sum and Contract Time being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Owner, Contractor, and Architect, or by written Construction Change Directive signed by the Owner and Architect. Upon issuance of the Change Order or Construction Change Directive, the Contractor shall proceed promptly with such changes in the Work, unless otherwise provided in the Change Order or Construction Change Directive.

§ 13.2 Adjustments in the Contract Sum and Contract Time resulting from a change in the Work shall be determined by mutual agreement of the parties or, in the case of a Construction Change Directive signed only by the Owner and Architect, by the Contractor's cost of labor, material, equipment, and reasonable overhead and profit, unless the parties agree on another method for determining the cost or credit. Pending final determination of the total cost of a Construction Change Directive, the Contractor may request payment for Work completed pursuant to the Construction Change Directive. The Architect will make an interim determination of the amount of payment due for purposes of certifying the Contractor's monthly Application for Payment. When the Owner and Contractor agree on adjustments to the Contract Sum and Contract Time arising from a Construction Change Directive, the Architect will prepare a Change Order.

§ 13.2.1 The value of a Change in the Work, shall be determined by one or more of the following:

- .1 Unit Prices or alternates previously agreed to by Contractor and Owner;
- .2 If no such Unit Price or Alternates are previously agreed to, then value of the Change shall be determined by adding or deducting a fixed sum amount agreed on between the Owner and the Contractor; or
- .3 By adding:
 - a. the actual cost to Contractor of labor for base wages only, including required union benefits as set forth in the applicable collective bargaining agreement, plus premiums required to be paid by Contractor for liability and workers' compensation insurance for such labor, plus state taxes for unemployment insurance and federal social security taxes, plus an allowance of 10% for Contractor's profit, supervision, administrative and all other overhead, indirect costs, and additional performance, labor, and material bond costs related to the labor portion of the Change; plus
 - b. The actual cost to Contractor of materials incorporated or to be incorporated into the Project, including transportation to the site, plus maintenance, operation and rental, or reasonable rental value, of Contractor owned equipment, other than small tools, plus an allowance of five percent (5%) for Contractor's profit, supervision, administrative and all other overhead, indirect costs, and additional performance, labor, and material bond costs related to the materials portion of the Change.
- .4 Should Contractor be required or permitted to subcontract all or a portion of the Change to be performed on the basis of the cost of labor and materials, payments to a Subcontractor of any tier that actually performs the Change shall be governed by the provision in subparagraph c above with the exception of the allowance stipulated therein. In the event of subcontracting the Change, the Contractor will be entitled to an allowance of ten percent (10%) for labor and five percent (5%) for material instead of the allowance set forth in subparagraph c above and it shall be the responsibility of the Contractor and its Subcontractor(s) of all tiers to allocate the allowances set forth in this subparagraph d between and amongst themselves.
- .5 In order to facilitate checking of quotations for extras or credits, all proposals, shall be accompanied by a complete itemization of costs including labor, materials and sub-contracts. Labor and materials shall be itemized in the manner prescribed below and in the format described in the Specifications. Where major cost

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items are subcontracts, they shall be itemized also. All proposals without such itemization will be returned to the Contractor for resubmission, and Owner may issue a Construction Change Directive in lieu thereof.

1. Materials (Itemized Breakdown) _____
2. Rental of Equipment (Itemized Breakdown) _____
3. Subtotal (Add lines 1-2) _____
4. Overhead and Profit (10% x line 3) _____
5. Subtotal (Add lines 3-4) _____
6. Labor (Itemized Breakdown) _____
7. Insurance on Labor (Workmen's Comp., etc.) _____
8. Subtotal (Add lines 6 and 7) _____
9. Overhead and Profit (15% x line 8) _____
10. Subtotal (Add lines 8 and 9) _____
11. Subcontract Work (Include Itemized Breakdown, Subcontractor's overhead and profit allowed is 10%) _____
12. Prime Contractor Overhead and Profit (5% x line 11) _____
13. Subtotal (Add lines 7 & 8) _____
14. Subtotal (Add lines 5, 10, and 13) _____
15. Bond charges (2% x line 14) _____
16. TOTAL CHANGE ORDER
(Add lines 14 and 15) _____

.6 For additional bond charges for the total Change Order, two (2%) percent of the Cost. This shall apply for Deduct Change Orders as well.

.7 When performing any Work on the basis of the cost of labor and materials, and Contractor or its Subcontractors are permitted or required to perform any overtime work, the cost of labor shall include additional wages over and above straight time rates, as well as wages at straight time rates. However, the allowance set forth in subparagraph 13.2.1 subsubparagraphs .3 or .4, if applicable, shall not be computed nor paid with respect to such additional wages. Superintendent or non-working foreman fees are not allowed.

§ 13.3 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes

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shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly. 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.

§ 13.4 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be equitably adjusted as mutually agreed between the Owner and Contractor; provided that the Contractor provides notice to the Owner and Architect promptly and before conditions are disturbed.

ARTICLE 14 TIME

§ 14.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing this Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 14.2 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 14.3 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 14.4 The date of Substantial Completion is the date certified by the Architect in accordance with Section 15.6.3.

§ 14.5 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) changes ordered in the Work; (2) by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions not reasonably anticipatable, unavoidable casualties, or any causes beyond the Contractor's control; or (3) 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, subject to the provisions of Article 21.

ARTICLE 15 PAYMENTS AND COMPLETION

§ 15.1 Schedule of Values

§ 15.1.1 Where the Contract is based on a Stipulated Sum or the Cost of the Work with a Guaranteed Maximum Price pursuant to Section 3.2 or 3.4, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Stipulated Sum or Guaranteed Maximum Price 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 of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 15.1.2 The allocation of the Stipulated Sum or Guaranteed Maximum Price under this Section 15.1 shall not constitute a separate stipulated sum or guaranteed maximum price for each individual line item in the schedule of values.

§ 15.2 Control Estimate

§ 15.2.1 Where the Contract Sum is the Cost of the Work, plus the Contractor's Fee without a Guaranteed Maximum Price pursuant to Section 3.3, the Contractor shall prepare and submit to the Owner a Control Estimate within 14 days of executing this Agreement. The Control Estimate shall include the estimated Cost of the Work plus the Contractor's Fee.

§ 15.2.2 The Control Estimate shall include:

- .1 the documents enumerated in Article 6, including all Modifications thereto;
- .2 a list of the assumptions made by the Contractor in the preparation of the Control Estimate to supplement the information provided by the Owner and contained in the Contract Documents;
- .3 a statement of the estimated Cost of the Work organized by trade categories or systems and the Contractor's Fee;
- .4 a project schedule upon which the Control Estimate is based, indicating proposed Subcontractors, activity sequences and durations, milestone dates for receipt and approval of pertinent information, schedule of shop drawings and samples, procurement and delivery of materials or equipment the Owner's occupancy requirements, and the date of Substantial Completion; and

- .5 a list of any contingency amounts included in the Control Estimate for further development of design and construction.

§ 15.2.3 When the Control Estimate is acceptable to the Owner and Architect, the Owner shall acknowledge it in writing. The Owner's acceptance of the Control Estimate does not imply that the Control Estimate constitutes a Guaranteed Maximum Price.

§ 15.2.4 The Contractor shall develop and implement a detailed system of cost control that will provide the Owner and Architect with timely information as to the anticipated total Cost of the Work. The cost control system shall compare the Control Estimate with the actual cost for activities in progress and estimates for uncompleted tasks and proposed changes. This information shall be reported to the Owner, in writing, no later than the Contractor's first Application for Payment and shall be revised and submitted with each Application for Payment.

§ 15.2.5 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in the Control Estimate. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the Control Estimate and the revised Contract Documents.

§ 15.3 Applications for Payment

§ 15.3.1 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 15.1, for completed portions of the Work. The application shall be notarized, if required; be supported by all data substantiating the Contractor's right to payment that the Owner or Architect require; shall reflect retainage if provided for in the Contract Documents; and include any revised cost control information required by Section 15.2.4. 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.

§ 15.3.2 With each Application for Payment where the Contract Sum is based upon the Cost of the Work, or the Cost of the Work with a Guaranteed Maximum Price, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

§ 15.3.3 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 stored, and protected from damage, off the site at a location agreed upon in writing.

§ 15.3.4 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 other encumbrances adverse to the Owner's interests.

§ 15.4 Certificates for Payment

§ 15.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner of the Architect's reasons for withholding certification in whole or in part as provided in Section 15.4.3.

§ 15.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluations 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 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.

§ 15.4.3 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 15.4.2 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 15.4.1. If the Contractor and the 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 9.2.2, because of

- .1 defective Work not remedied;
- .2 third-party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .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.

§ 15.4.4 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 15.4.3, in whole or in part, that party may submit a Claim in accordance with Article 21.

§ 15.5 Progress Payments

§ 15.5.1 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.

§ 15.5.2 Neither the Owner nor Architect shall have an obligation to pay or see to the payment of money to a Subcontractor or supplier except as may otherwise be required by law.

§ 15.5.3 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.

§ 15.5.4 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.

§ 15.6 Substantial Completion

§ 15.6.1 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.

§ 15.6.2 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.

§ 15.6.3 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. When the Architect determines that the Work or designated portion thereof is substantially complete, the Architect will issue a Certificate of Substantial Completion which 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.

§ 15.6.4 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.

§ 15.7 Final Completion and Final Payment

§ 15.7.1 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 and, 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 stated in Section 15.7.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 15.7.2 Final payment shall not become due until the Contractor has delivered to the Owner a complete release of all liens arising out of this Contract or receipts in full covering all labor, materials and equipment for which a lien could be filed, or a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien 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 such lien, including costs and reasonable attorneys' fees.

§ 15.7.3 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.

§ 15.7.4 Acceptance of final payment by the Contractor, a Subcontractor or 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 the final Application for Payment.

ARTICLE 16 PROTECTION OF PERSONS AND PROPERTY

§ 16.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; 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.

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 and property and their protection from damage, injury, or loss. The Contractor shall promptly remedy damage and loss to property 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 16.1.2 and 16.1.3. 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 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 9.15.

§ 16.2 Hazardous Materials and Substances

§ 16.2.1 The Contractor is responsible for compliance with the requirements of 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. 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 in the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 16.2.2 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 16.2.1 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.

§ 16.2.3 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 indemnify the Contractor for all cost and expense thereby incurred.

ARTICLE 17 INSURANCE AND BONDS

§ 17.1 Contractor's Insurance

§ 17.1.1 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 this Section 17.1 or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the insurance required by this Agreement 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 18.4, unless a different duration is stated below:

The Contractor shall provide written notification to the Owner of the cancellation or expiration of any insurance required by this Section 17.1. The Contractor shall provide such written notice within five (5) business days of the date the Contractor is first aware of the cancellation or expiration, or is first aware that the cancellation or expiration is threatened or otherwise may occur, whichever comes first.

§ 17.1.1.1 Notwithstanding any terms, conditions or provisions in any other writing between the parties, the Contractor hereby agrees to effectuate the naming of the **Putnam Valley Central School District** as an additional insured on the Contractor's insurance policies, with the exception of Workers' Compensation and NYS Disability Insurance.

§ 17.1.1.2 The policy naming the Owner as an additional insured shall:

- .1 Be an insurance policy from an A.M. Best rated "secured" or better insurer, authorized to conduct business in New York State. A New York licensed insurer is preferred. The decision to accept specific insurers lies exclusively with the Owner.
- .2 State that the Contractor's coverage shall be primary and non-contributory coverage for the Owner, its Board of Education, employees and volunteers.
3. Additional insured status shall be provided by standard or other endorsements that extend coverage to the Owner for both ongoing and completed operations. The decision to accept an endorsement rests solely with the Owner. A completed copy of the endorsements must be attached to the certificate of insurance.
4. The certificate of insurance must describe the specific services provided by the Contractor (e.g., roofing, carpentry, plumbing) that are covered by the liability policies.
5. At the Owner's request, the Contractor shall provide a copy of the declaration page of the liability and umbrella policies with a list of endorsements and forms. If so requested, the Contractor will provide a copy of the police endorsements and forms.
6. A fully completed New York Construction Certificate of Liability Insurance Addendum (ACORD 855 2014/5) must be included with the certificates of insurance.

§ 17.1.1.3 The Contractor agrees to indemnify the Owner for any applicable deductibles and self-insured retentions.

§ 17.1.2 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than One Million Dollars (\$ 1,000,000) each occurrence, Two Million Dollars (\$ 2,000,000) general aggregate, and Two Million Dollars (\$ 2,000,000) 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 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 9.15.

The general aggregate shall apply on a per-project basis.

§ 17.1.3 Automobile Liability covering vehicles owned by the Contractor and non-owned vehicles used by the Contractor, with policy limits of not less than One Million Dollars (\$ 1,000,000) combined single limit for owned, hired and borrowed and non-owned motor vehicles, 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.

\$1,000,000	Combined Single Limit or
\$ 500,000	Bodily injury (per person)
\$1,000,000	Bodily injury (per accident)
\$ 500,000	Property Damage
\$5,000	Medical Payments

§ 17.1.4 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 those required under Section 17.1.2 and 17.1.3, 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.

§ 17.1.5 Workers' Compensation, Employer's Liability and NYS Disability Insurance for all employees at statutory limits. Proof of coverage must be on the approved specific form, as required by the NYS Workers' Compensation Board. ACORD certificates are not acceptable.

Statutory	Part A
Statutory	Disability

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Employer's Liability	Part B
\$ 500,000	Each Accident
\$1,000,000	Disease Policy Limit
\$ 500,000	Disease Each Employee

§ 17.1.6 Excess Insurance: Insurance is to cover all stated insurance coverages listed within this

- **\$5 million each Occurrence and Aggregate** for general construction and no work at elevation (1 story – 10 feet) or project values less than or equal to \$1,000,000.
- **\$10 million each Occurrence and Aggregate for high-risk construction**, work at elevation (>1 story or 10 feet) or project values greater than \$1,000,000.

Umbrella/Excess coverage shall be on a follow-form basis over the Auto Liability and General Liability coverages. Excess coverage shall be on a follow-form basis.

§ 17.1.7 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 (\$) per claim and (\$) in the aggregate.

§ 17.1.8 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 (\$) per claim and (\$) in the aggregate.

Hazardous material liability insurance as follows:	\$2,000,000 occurrence/\$2,000,000 aggregate, including products and completed operations.
Such insurance shall include coverage for the Contractor's operations including, but not limited to, removal, replacement enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a retroactive date is used, it shall pre-date the inception of the Contract.	
If motor vehicles are used for transporting hazardous materials, the Contractor shall provide pollution liability broadened coverage (ISO endorsement CA 9948) as well as proof of M CS 90. Coverage shall fulfill all requirements of the Contract and General Conditions and shall extend for a period of three (3) years following acceptance by the Owner of the Certificate of Completion.	

§ 17.1.9 Coverage under Sections 17.1.7 and 17.1.8 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than (\$) per claim and (\$) in the aggregate.

§ 17.1.10 The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Section 17.1 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 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 period required by Section 17.1.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy.

§ 17.1.11 The Contractor shall disclose to the Owner any deductible or self- insured retentions applicable to any insurance required to be provided by the Contractor.

§ 17.1.12 Contractor acknowledges that failure to obtain and maintain such insurance on behalf of the Owner constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to the Owner.

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§ 17.1.13 To the fullest extent permitted by law, the Contractor shall cause the commercial liability coverage required by this Section 17.1 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.

§ 17.1.14 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 this Section 17.1, 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 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.

§ 17.1.15 Other Insurance Provided by the Contractor

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage

Limits

Testing Company Errors and Omission Insurance:

\$1,000,000

Each Occurrence

For the testing and other professional acts of the Contractor performed under the contract with the Owner. Further, Contractor shall require all Subcontractors to carry the same insurance coverages and limits of liability as set forth above and adjusted to the nature of Subcontractors' operations and submit same to Owner for approval prior to start of any Work.

\$2,000,000

Aggregate

Owners Contractors Protective (OCP) Insurance:

The District/BOCES will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

- For projects less than or equal to \$1,000,000 and work on 1 story (10 feet) only;
- For projects greater than \$1,000,000 and/or work over 1 story (10 feet);
- For all projects where General Liability, Auto and Umbrella/Excess Coverage is with non-licensed and non-admitted carriers in New York State;

- \$1 million per occurrence, \$2 million aggregate with the District/BOCES as the Named Insured.
- \$2 million per occurrence, \$4 million aggregate with the District/BOCES as the Named Insured.
- \$2 million per occurrence, \$4 million aggregate with the District/BOCES as the named Insured.

§ 17.2 Owner's Insurance

§ 17.2.1 Owner's Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 17.2.2 Property Insurance

§ 17.2.2.1 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 or materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section 17.2.2.2, 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.

§ 17.2.2.2 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section 17.2.2.1 or, if necessary, replace the insurance policy required under Section 17.2.2.1 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 18.4. The Owner shall provide written notification to the Contractor of the cancellation or expiration of any insurance required by Sections 17.2 and 17.3. The Owner shall provide such written notice within five (5) business days of the date the Owner is first aware of the cancellation or expiration, or is first aware that the cancellation or expiration is threatened or otherwise may occur, whichever comes first.

§ 17.2.2.3 If the insurance required by this Section 17.2.2 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ 17.2.2.4 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 18.4, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ 17.2.2.5 Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Section 17.2.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by this Section 17.2.2. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ 17.2.2.6 Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any insurance required by this Section 17.2.2, 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.

§ 17.2.2.7 Waiver of Subrogation

§ 17.2.2.7.1 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 this 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 17.2.2.7 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.

§ 17.2.2.7.2 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 17.2.2.7.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 17.2.2.8 A loss insured under the Owner's property insurance 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. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements, written where legally required for validity, the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 17.2.3 Other Insurance Provided by the Owner

(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage

Limits

§ 17.3 Performance Bond and Payment Bond

§ 17.3.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in the Contract Documents on the date of execution of the Contract. The form of the Performance Bond shall be AIA Form A312 and the form of the Payment Bond shall be AIA Form A312.

§ 17.3.2 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.

ARTICLE 18 CORRECTION OF WORK

§ 18.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after 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, unless compensable under Section A.1.7.3 in Exhibit A, Determination of the Cost of the Work.

§ 18.2 In addition to the Contractor's obligations under Section 9.4, 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 15.6.3, or by terms of an 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.

§ 18.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 8.3.

§ 18.4 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.

§ 18.5 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Article 18.

ARTICLE 19 MISCELLANEOUS PROVISIONS

§ 19.1 Assignment of Contract

Neither party to the Contract shall assign the Contract without written consent of the other, except that 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 such assignment.

§ 19.2 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 21.6.

§ 19.3 Tests and Inspections

Tests, inspections, and approvals of portions of the Work required by the Contract Documents or by applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the 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.

§ 19.4 The Owner's representative:

(Name, address, email address and other information)

Jill Figarella, District Treasurer
Putnam Valley Central School District
146 Peekskill Hollow Road
Putnam Valley, NY 10579

§ 19.5 The Contractor's representative:

(Name, address, email address and other information)

§ 19.6 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 19.7 No claims for increased costs, charges, expenses or damages of any kind shall be made by the Contractor against the Owner for any delays or hindrances from any cause whatsoever, provided that the Owner, in the Owner's discretion, may compensate the Contractor for any said delays by extending the time for completion of the Work as specified in the Contract. Should the Contractor sustain any damages through any act or omission of any other contractor having a contract with the Owner or through any act or omission of any subcontractor of said other contractor, the Contractor shall have no claim against the Owner for same damage.

ARTICLE 20 TERMINATION OF THE CONTRACT

§ 20.1 Termination by the Contractor

If the Architect fails to certify payment as provided in Section 15.4.1 for a period of 30 days through no fault of the Contractor, or if the Owner fails to make payment as provided in Section 4.1.3 for a period of 30 days, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner payment for Work executed.

§ 20.2 Termination by the Owner for Cause

§ 20.2.1 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 for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .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.

§ 20.2.2 When any of the reasons described in Section 20.2.1 exists, the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may, without prejudice to any other remedy the Owner may have and after giving the Contractor seven days' notice, terminate the Contract and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever reasonable method the Owner may deem expedient. Upon 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.

§ 20.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 20.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 20.2.4 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 Architect, upon application, and this obligation for payment shall survive termination of the Contract.

§ 20.3 Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Owner shall pay the Contractor for Work executed; and costs incurred by reason of such termination, including costs attributable to termination of Subcontracts; and a termination fee, if any, as follows:

(Insert the amount of or method for determining the fee payable to the Contractor by the Owner following a termination for the Owner's convenience, if any.)

ARTICLE 21 CLAIMS AND DISPUTES

§ 21.1 Claims, disputes, and other matters in question arising out of or relating to this Contract, including those alleging an error or omission by the Architect but excluding those arising under Section 16.2, shall be referred initially to the Architect for decision. Such matters, except those waived as provided for in Section 21.11 and Sections 15.7.3 and 15.7.4, shall, after initial decision by the Architect or 30 days after submission of the matter to the Architect, be subject to mediation as a condition precedent to binding dispute resolution.

§ 21.2 Notice of Claims

§ 21.2.1 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 18.2, shall be initiated by notice to the Architect 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.

§ 21.2.2 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 18.2, shall be initiated by notice to the other party.

§ 21.3 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 in accordance with the requirements of the final dispute resolution method selected in this Agreement whether in contract, tort, breach of warranty, or otherwise, 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 21.3.

§ 21.4 If a claim, dispute or other matter in question relates to or is the subject of a mechanic's lien, the party asserting such matter may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 21.5 The parties shall endeavor to resolve their disputes by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with their Construction Industry Mediation Procedures in effect on the date of this Agreement. A request for mediation shall be made in

writing, delivered to the other party to this Agreement, and filed with the person or entity administering the mediation. The request may be made concurrently with the binding dispute resolution 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, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 21.6 The parties agree that any mediation commenced with respect to this Agreement shall be expanded by any party to include resolution of disputes involving any other party involved in the Project, provided the dispute arises out of common questions of law and/or fact. It is expressly agreed that there will be no arbitration as to any matters arising under or relating to this Agreement.

§ 21.7 If mediation is not successful, the parties agree that any action or proceeding arising under this Agreement shall be brought in a New York State court of competent jurisdiction located in Putnam County.

§ 21.8 The parties expressly agree to delete the requirement that any and all disputes, controversies and claims arising out of the Contract be referred to arbitration. By so agreeing, the parties express their mutual intent that there is no agreement to arbitrate such disputes notwithstanding the use and reference to arbitration elsewhere in the Contract Documents.

§ 21.9 Continuing Contract Performance

Pending final resolution of a Claim, except as otherwise agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 21.10 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 20. Nothing contained in this Section 21.11 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

President, Board of Education
(Printed name and title)

CONTRACTOR (Signature)

, President,
(Printed name and title)

Putnam Valley Central School District
171 Oscawana Lake Road, Putnam Valley, NY 10579

CONTRACTOR AGREEMENT – PURCHASE ORDERS – SERVICE & REPAIR WORK

1. Notwithstanding any terms, conditions or provisions, in any other writing between the parties, the contractor hereby agrees to effectuate the naming of Putnam Valley Central School District as an additional insured on the contractor's insurance policies, except for workers' compensation and N.Y. State Disability insurance.
2. The policy naming Putnam Valley Central School District as an additional insured should:
 - a. Be an insurance policy from an A.M. Best rated A- or better insurer. A New York licensed insurer is strongly preferred. The decision to accept non-licensed and non-admitted carriers lies exclusively with Putnam Valley Central School District and may create significant vulnerability and costs for the District/BOCES.
 - b. State that the organization's coverage shall be primary and noncontributory coverage for the Putnam Valley Central School District, its Board, employees and volunteers.
 - c. Additional insured status shall be provided by standard or other endorsements that extend coverage to Putnam Valley Central School District for both on-going operations (CG 20 38) and products and completed operations (CG 20 37). The decision to accept an endorsement rests solely with the Putnam Valley Central School District. A completed copy of the endorsements must be attached to the certificate of insurance.
3. The contractor agrees to indemnify Putnam Valley Central School District for any applicable deductibles and/or self-insured retentions.
4. Minimum Required Insurance:
 - a. **Commercial General Liability Insurance**
\$1,000,000 per Occurrence/ \$2,000,000 Aggregate
\$2,000,000 Products and Completed Operations
\$1,000,000 Personal and Advertising Injury
\$100,000 Fire Damage
\$10,000 Medical Expense
The general aggregate shall apply on a per-project basis.
 - b. **Automobile Liability**
\$1,000,000 combined single limit for owned, hired, borrowed and non-owned motor vehicles. Must show coverage level on COI. If insurance is with a different carrier a second COI will be submitted.
 - c. **Workers' Compensation and NYS Disability Insurance**
Statutory Workers' Compensation (C-105.2 or U-26.3); and NYS Disability Insurance (DB-120.1) for all employees. Proof of coverage must be on the approved specific form, as required by the New York State Workers' Compensation Board. ACORD certificates are not acceptable. A person seeking an exemption must file a CE-200 Form with the state. The form can be completed and submitted directly to the WC Board online.
 - d. **Umbrella/Excess Insurance**
☐ \$2 million each Occurrence and Aggregate.
☒ \$5 million each Occurrence and Aggregate.
 Umbrella/Excess coverage shall be on a follow-form basis.
5.
 - a. The certificate of insurance must describe the specific services provided by the contractor (e.g., carpentry, plumbing, etc.) that are covered by the liability policies.
 - b. At the District's request, the contractor shall provide a copy of the declaration page of the liability and umbrella policies with a list of endorsements and forms. If so requested, the contractor will provide a copy of the policy endorsements and forms.
6. Contractor acknowledges that failure to obtain such insurance on behalf of Putnam Valley Central School District constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to the District. The contractor is to provide Putnam Valley Central School District with a certificate of insurance, evidencing the above requirements has been met, prior to the commencement of work or use of facilities.
7. Sub-contractors are subject to the same terms and conditions as stated above and submit the same to District/BOCES for approval prior to start of any work.

8. In the event the contractor fails to obtain the required certificates of insurance from the Subcontractor and a claim is made or suffered, the Contractor shall indemnify, defend and hold harmless the Putnam Valley Central School District, its Board, employees and volunteers from any and all claims for which the required insurance would have provided Coverage.

Purchasing Terms (TO BE COMPLETED BY THE DISTRICT/BOCES OR THIS DOCUMENT CAN BE ATTACHED TO THE PURCHASE ORDER AND THIS SECTION OMITTED):

1. PT 1
2. PT 2
3. PT 3
4. PT 4
5. PT 5

Indemnification

To the fullest extent permitted by law, _____ agrees to defend, indemnify and hold harmless the
(contractor name)

Putnam Valley Central School District, as well as any other parties which the contractor is required under the contract documents to defend, indemnify and hold harmless, their agents, servants and employees, from and against any claim, cost, expense or liability (including costs and attorneys' fees incurred in enforcing this indemnity), attributed to bodily injury, sickness, disease or death, or to damage to or destruction of property (including loss of use thereof), caused by, arising out of, resulting from or occurring in connection with the performance of the work by the contractor, its subcontractors and suppliers or their agents, servants and employees whether or not caused in part by the active or passive negligence, partial negligence or other fault of the party indemnified hereunder; provided, however, the contractor's duty hereunder shall not arise if such injury, sickness, disease, death, damage or destruction is caused by the sole negligence of the party indemnified hereunder. The contractor's obligation shall not be limited by the provisions of any Workers' Compensation Law or similar Act.

The undersigned has read this agreement and agrees to abide by its terms and requirements.

Date	Name & Title
School District or BOCES	Signature
Address	Telephone Number and Email

Date	Name & Title
Name of Company	Signature
Address of Company	Telephone Number and Email



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)

Putnam Valley Central School District
171 Oscawana Lake Road
Putnam Valley, NY 10579

BOND AMOUNT: \$

PROJECT:

Putnam Valley COVID-Related Capital Projects
171 Oscawana Lake Road & 146 Peekskill Hollow Road, Putnam Valley, NY
Elementary School SED 48-05-03-04-0-001-013
Elementary School Modular Building SED 48-05-03-04-0-007-002
High School SED 48-05-03-04-0-010-006
Transportation Building SED 48-05-03-04-5-012-003

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

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

where the author has added to or deleted from the original AIA text.

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

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

Init.

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User Notes:

(843987298)

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 ,

(Witness)

(Witness)

(Contractor as Principal)

(Seal)

(Title)

(Surety)

(Seal)

(Title)

Init.

/



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)

Putnam Valley Central School District
171 Oscawana Lake Road
Putnam Valley, NY 10579

CONSTRUCTION CONTRACT

Date:

Amount: \$ 0.00

Description:

Putnam Valley COVID-Related Capital Projects
171 Oscawana Lake Road & 146 Peekskill Hollow Road, Putnam Valley, NY
Elementary School SED 48-05-03-04-0-001-013
Elementary School Modular Building SED 48-05-03-04-0-007-002
High School SED 48-05-03-04-0-010-006
Transportation Building SED 48-05-03-04-5-012-003

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL

Company: (Corporate Seal)

SURETY

Company: (Corporate Seal)

Signature: _____

Name and

Title:

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

Signature: _____

Name and

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

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

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

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

§ 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.

§ 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.

§ 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

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____



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)

Putnam Valley Central School District
171 Oscawana Lake Road
Putnam Valley, NY 10579

CONSTRUCTION CONTRACT

Date:

Amount: \$ 0.00

Description:

Putnam Valley COVID-Related Capital Projects
171 Oscawana Lake Road & 146 Peekskill Hollow Road, Putnam Valley, NY
Elementary School SED 48-05-03-04-0-001-013
Elementary School Modular Building SED 48-05-03-04-0-007-002
High School SED 48-05-03-04-0-010-006
Transportation Building SED 48-05-03-04-5-012-003

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL

Company: (Corporate Seal)

Signature: _____

Name and

Title: _____

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

SURETY

Company: (Corporate Seal)

Signature: _____

Name and

Title: _____

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

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

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

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

§ 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.

§ 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.

§ 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

Company: _____
(Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____
(Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

Init.

/



AIA[®] Document G716[™] – 2004

Request for Information ("RFI")

TO:

FROM:

PROJECT:

ISSUE DATE:

RFI No.

PROJECT NUMBERS: /

REQUESTED REPLY DATE:

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.

24 June 2022
Construction Documents
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District
COVID-Related Capital Projects
Elementary School Outdoor Classrooms
Elementary School Modular Building Alterations
High School Exterior Courtyard Alterations
Transportation Building Alterations

REQUISITION FOR PARTIAL PAYMENT - WAIVER OF LIENS

PROJECT	OWNER
GENERAL CONTRACTOR	SUBCONTRACTOR/VENDOR
CONTRACT	WORK COMPLETE
PROJECT:	CONTRACT - \$
TRADE:	CHANGE ORDERS - \$
CONTRACT - \$	TOTAL COMPLETE - \$
CHANGE ORDERS - \$	RETAINAGE (%) - \$
TOTAL CONTRACT - \$	LESS PRE. REQ. - \$
	THIS REQUISITION - \$

The undersigned, upon receipt of the above requisition payment hereby releases and discharges the Owner of and from any liability or obligation in any way related to or arising out of this project up to and including the date of this document.

The undersigned further covenants and agrees that it shall not in any way claim or file a mechanic's or other lien against the premises of the above designated project, or any part thereof, or against any fund applicable thereto for any of the work, labor, materials heretofore furnished by it in connection with the improvement of said premises.

The undersigned further warrants that, in order to induce the Owner to release this partial payment, they have paid all claims for labor, material, insurance, taxes, equipment, etc., employed in the prosecution of the work above, to date of this requisition.

The undersigned hereby releases and agrees to hold the Owner harmless from any and all claims in connection with the furnishing of such labor and materials, etc., for the construction of the aforementioned project.

The undersigned further guarantees that all portions of the work furnished and/or provided by them are in accordance with the contract and that the terms of the contract with respect to these guarantees will hold for the period specified in said contract.

IN WITNESS WHEREOF, we have executed under seal this release on the date below and to be legally bound hereby:

WITNESS: _____ FIRM: _____
BY: _____ DATE: _____

24 June 2022
Construction Documents
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District
COVID-Related Capital Projects
Elementary School Outdoor Classrooms
Elementary School Modular Building Alterations
High School Exterior Courtyard Alterations
Transportation Building Alterations

CORPORATE ACKNOWLEDGEMENT
State of

)SS.
)

County of

On the _____ day of _____, before me came _____ to me known and who by me being duly sworn did depose and say that he resides at _____; that he is the officer of the said corporation executing the foregoing instrument, that he knows the seal of said corporation, that the seal affixed to said instrument is such corporate seal, that it was so affixed by order of the Board of Directors of said corporation and that he signed his name thereto by like order.

Notary Public

INDIVIDUAL ACKNOWLEDGEMENT
State of

)SS.
)

County of

On the _____ day of _____, before me came _____ to me known and who by me being duly sworn did depose and say that he resides at _____ that he is the individual who executed the foregoing instrument.

Notary Public

PARTNERSHIP ACKNOWLEDGEMENT
State of

)SS.
)

County of

On the _____ day of _____, before me came _____ to me known and who by me being duly sworn did depose and say that he resides at _____; that he is the partner in the firm of _____ doing business under the name of _____ and that he executed the foregoing instrument on behalf of said partnership.

Notary Public

Section 00 70 02

Insurance Rider

(Supplement to Article 11 of Section 00 70 00, AIA A201-07 for Insurance Requirements for this Project)

Name of Insurance Producer:	
Name of Insured:	

The Contractor shall purchase and maintain during the life of the contract insurances as listed herein. This insurance must be purchased from a New York State licensed and admitted, A.M. Best Rated "A" or "A+" carrier. The Owner, the Architect, their Consultants and Subconsultants shall, with the exception of Worker's Compensation and Employer's Liability Insurance, be named as additional named insureds on a primary and non-contributory basis. Contractor must submit additional insured endorsements to the District for approval.

At least ten (10) working days prior to the commencement of the Work, the Contractor and all Subcontractors shall submit to the Owner, through the Architect, a Certificate of Insurance (AIA Form G705) or Accord 25-s showing evidence of insurance coverage as required by these documents. The standard Accord Form of Certificate of Insurance or insurance carrier certificate will be acceptable for employer's liability, NYS Disability must be on Form DB120.1. Submit all Workers' Compensation Certificates on form C-105.2, or if funded through the New York State Insurance Fund, on form U-26.3.

All Certificates of Insurance must be signed by a licensed agent or authorized representative of the insurance carrier.

The certificate shall be issued to the Owner with a provision that in the event the policies are either canceled or diminished, at least 30 days prior notice thereof shall be given to the Owner.

The insurance required for this project shall be written for not less than limits of liability specified in this attachment or otherwise within the Contract Documents or required by law, whichever coverage is greater. Coverages, shall be on an occurrence basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

- .1 **General Liability:** (Occurrence Form) – Limits Per Project using ISO Form CG 00 01 07 98 or later date

\$2,000,000	General Aggregate
\$2,000,000	Products/Completed Operations
\$1,000,000	Personal and Adv. Injury
\$1,000,000	Occurrence
\$100,000	Fire Damage
\$ 10,000	Medical Expense

Coverage to include Broad Form Property Damage, Contractual Liability, Independent Contractors, and Personal Injury. No exclusion for XCU or hazards shall be endorsed to the Policy.

Products and Completed Operations Coverage to be kept in force for 24 months after final payment; a renewal certificate is to be submitted for the project if the coverage renews in less than 12 months following the completion of the project.

Coordinate requirements for additional insurance covering contractual obligations assumed by Contractor as established in Articles 3.18 and 10.3 of these Conditions by using Endorsement ISO Form B, CG 20 38 and CG 20 37 or equivalent. This endorsement must also reflect that the coverage provided is Primary and Non-Contributory. Waiver of Subrogation applies to all policies for all additional insureds.

.2 Auto Liability to cover ALL autos; or Owned, Hired, Leased and Non-Owned Autos.

\$1,000,000	Combined Single Limit or
\$ 500,000	Bodily injury (per person)
\$1,000,000	Bodily injury (per accident)
\$ 500,000	Property Damage
\$5,000	Medical Payments

- .3 Excess Liability:** Insurance is to cover all stated insurance coverages listed within this
- \$5 million each Occurrence and Aggregate for general construction and no work at elevation (1 story – 10 feet) or project values less than or equal to \$1,000,000.
 - \$10 million each Occurrence and Aggregate for high-risk construction, work at elevation (>1 story or 10 feet) or project values greater than \$1,000,000.
 - Umbrella/Excess coverage shall be on a follow-form basis over the Auto Liability and General Liability coverages.

.4 Workers' Compensation

Statutory	Part A
Statutory	Disability
Employer's Liability	Part B
\$ 500,000	Each Accident
\$1,000,000	Disease Policy Limit
\$ 500,000	Disease Each Employee

.5 Owners Contractors Protective (OCP) Insurance

- For projects less than or equal to \$1,000,000 and work on 1 story (10 feet) only;
- \$1 million per occurrence, \$2 million aggregate with the District/BOCES as the Named Insured.
- For projects greater than \$1,000,000 and/or work over 1 story (10 feet); \$2 million per occurrence, \$4 million aggregate with the District/BOCES as the Named Insured.

- For all projects where General Liability, Auto and Umbrella/Excess Coverage is with non-licensed and non-admitted carriers in New York State; \$2 million per occurrence, \$4 million aggregate with the District/BOCES as the named Insured.
- The District/BOCES will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

.6 Hazardous Material Coverage

Hazardous material liability insurance as follows:	\$2,000,000 occurrence/\$2,000,000 aggregate, <u>including products and completed operations.</u>
Such insurance shall include coverage for the Contractor's operations including, but not limited to, removal, replacement enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a <u>retroactive date</u> is used, it shall <u>pre-date the inception of the Contract</u>	
If <u>motor vehicles are used for transporting hazardous materials, the Contractor shall provide pollution liability broadened coverage (ISO endorsement CA 9948) as well as proof of M CS 90.</u> Coverage shall fulfill all requirements of the Contract and General Conditions and shall extend for a period of three (3) years following acceptance by the Owner of the <u>Certificate of Completion</u>	

.7 Testing Company Errors and Omission Insurance

\$1,000,000	Each Occurrence
\$2,000,000	Aggregate

For the testing and other professional acts of the Contractor performed under the contract with the Owner.

Further, Contractor shall require all Subcontractors to carry the same insurance coverages and limits of liability as set forth above and adjusted to the nature of Subcontractors' operations and submit same to Owner for approval prior to start of any Work.

In the event Contractor fails to obtain the required certificates of insurance from the Subcontractor and a claim is made or suffered, the Contractor shall indemnify, defend and hold harmless Owner, Architect, Engineers, Consultants and Subconsultants and their agents or employees from any and all claims for which the required insurance would have provided coverage. This indemnity obligation is in addition to any other indemnity obligation provided in the Contract.

The following shall be included as Additional Insureds:

- Putnam Valley Central School District Members of the Board of Education, any officer, member of its staff, employee, or representative of school district.
- KG+D Architects, PC, and ALL consultants listed on the cover of the PROJECT/SPECIFICATIONS MANUAL

Proof of Insurance shall show the following Insureds and Holder:

- a) Certificate Holder
- b) Additional Names Insured, on a primary basis:
 - Owner
 - Architect
 - Construction Manager, if applicable
 - Consultant

24 June 2022
Construction Documents
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District
COVID-Related Capital Projects
Elementary School Outdoor Classrooms
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Transportation Building Alterations

SECTION 02 41 19

SELECTIVE DEMOLITION AND ALTERATION WORK

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the selective demolition and alteration work as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Alterations, selective demolition and removals as noted on drawings and as required to accommodate new construction.
 - 2. Removal of debris.
 - 3. Protection of existing building and spaces to remain, and shoring of the structure as required for structural integrity and personal safety.
 - 4. Temporary coverage passageways.
 - 5. Patching and refinishing of existing surfaces damaged as a result of this work.
 - 6. Protection.

1.3 QUALITY ASSURANCE

- A. The Contractor shall comply with the requirements of all applicable Federal, State and local safety and health regulations regarding the demolition of structures including ANSI/NFPD 241-Building Construction and Demolition Operations.
- B. The Contractor shall be responsible for any damage to any adjacent structures or buildings to remain.
- C. Qualifications: Qualifications of Contractor for work of this Section shall not be less than ten (10) years of field experience in work of this nature.
- D. Professional Engineering: The Contractor shall retain the services of a Professional Engineer licensed in the State of New York, who shall design and supervise installation of all underpinning and shoring.

24 June 2022
Construction Documents
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District
COVID-Related Capital Projects
Elementary School Outdoor Classrooms
Elementary School Modular Building Alterations
High School Exterior Courtyard Alterations
Transportation Building Alterations

1.4 RELATED SECTIONS

- A. Alteration and removal requirements for mechanical and electrical work - Mechanical and Electrical Sections.

1.5 SUBMITTALS

- A. Schedule of Demolition Operations: Submit demolition procedures and operational sequence for Architect's review prior to start of work. Submit a written request to Architect well in advance of executing any cutting or alteration which affects:
 - 1. The work of tying in or connecting to operational systems of the building, including electrical, mechanical and security systems.
 - 2. The work of the Owner or any separate Contractor.
 - 3. The structural value or integrity of any element of the project or of adjacent structures.
 - 4. The integrity or effectiveness of weather-exposed and moisture-resistant elements or systems.
 - 5. The efficiency, operational life, maintenance, or safety of operational elements or systems.
- B. Notice of Differing Conditions: Submit a written notification if, during the work of demolition and cutting, conditions are discovered which significantly vary from those shown on the drawings. Do not commence work until approval of Architect.
- C. Shop Drawings: Submit the following prior to starting work:
 - 1. Submit for Architect's information shop drawings indicating location and typical construction details of temporary dustproof and weatherproof partitions.
 - 2. Submit drawings of temporary structural shoring, bracing, framing or support, for the information of the Architect. Such drawings will be reviewed by the Structural Engineer for the effects of such temporary members on the structural elements to remain. These drawings shall include the reason for such temporary members, the location, the direction and magnitude of design reaction forces on existing structure, and details showing how these reaction forces will be applied to the existing structure.
 - a. Shop drawings shall be submitted with the Seal of the P.E. engaged by Contractor; P.E. must be licensed in the State of New York.
 - b. The Architect will receive acknowledgment for concepts shown. Such acknowledgments shall be of the concept only and not of actual capacities or structural design and shall not in any way diminish or limit the Contractor's responsibility for the quality and performance of the work and for protecting

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existing structures and facilities.

1.6 SPECIAL PRECAUTION

- A. Hazardous materials may be encountered during demolition operations including asbestos; comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

1.7 JOB CONDITIONS

A. Condition of Structure

- 1. The Contractor for the work of this Section shall be held to have visited the site, examined the premises, determined for himself the existing conditions, character of equipment and facilities needed for the performance of the work, and all matters which may in any way affect the work before submitting a bid.
 - a. Information regarding existing construction or conditions is based on available record drawings which may or may not truly reflect existing conditions. Such information is included on the assumption that it may be of interest to the Contractor, but the Architect, Owner and their consultants do not assume responsibility for its accuracy or completeness.
 - b. Notify the Architect if, during the course of demolition, conditions are discovered which significantly vary from those shown on the drawings. Do not proceed until authorized by Architect.
- 2. The Contractor shall accept the condition of the site and structures as found. The Architect and Owner assume no responsibility for condition of site or structures nor the continuation of the condition existing at time of bidding or thereafter.

- B. Areas of building to be demolished or altered will be vacated and discontinued in use prior to the start of the work.

- 1. Surrounding areas of the building shall remain operational by the Owner.

C. Partial Removal

- 1. Items of savable value to the Contractor may be removed from the structure as the work progresses. Salvaged items must be transported from the site as they are removed.
 - 2. Storage or sale of removed items on the site will not be permitted.

- D. Explosives: The use of explosives will not be permitted.

E. Traffic

- 1. Conduct demolition operations and the removal of debris to ensure minimum

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interference with roads, streets, walks and other adjacent occupied or used facilities.

2. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

F. Utilities

1. Refer to Division 22 and 26 of the specifications for special requirements concerning utilities and services.
2. Maintain any existing utilities required to remain; keep in service and protect against damage during demolition operations.
3. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the governing authorities.
4. Disconnect and seal any abandoned utilities before starting demolition operations. Coordinate all work with local utility companies having jurisdiction.

1.8 SCHEDULING

- A. Before commencing any alteration or demolition work, submit for review by the Architect, and approval of the Owner, a schedule showing the commencement, the order, and the completion dates for the various parts of this work.
- B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the structures to remain, notify the Architect and the Owner 7 days in advance and obtain the Owner's approval in writing before proceeding with this phase of the work.

PART 2 PRODUCTS

Refer to Part 3 - Execution, for Product Requirements

PART 3 EXECUTION

3.1 PROTECTION

- A. Take full precautions to protect workmen, passersby or any other persons from falling debris and other hazards of demolition operations.
- B. Execute demolition work to ensure protection of existing portions of building to remain against damages which might occur from falling debris or other cause. Do not interfere with use of adjacent occupied buildings and areas. Maintain free, safe passage to and

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from occupied adjacent buildings.

- C. Materials Placement: Do not load structure with weight that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- D. Construction Operations: Do not employ any construction operation, equipment or vehicles that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- E. Take precautions to guard against movement, settlement, damage, or collapse of any part of building, sidewalks, adjacent property or street passages; be liable for any such movement, settlement or collapse. If such damage does accidentally occur, Contractor shall repair promptly at no cost to Owner.
- F. Provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the work and property at all times, including Saturdays, Sundays, and holidays.
- G. Be responsible for any and all damages which may arise or occur to any party whatsoever by reason of the neglect in providing proper lights, guards, barriers, or any other safeguards to prevent damage to property, life and limb.
- H. Make such explorations and probes as are necessary to ascertain any required protective measures before proceeding with demolition and removal. Give particular attention to shoring and bracing requirements so as to prevent any damage to existing construction.
 - 1. Provide interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain. The Contractor's Professional Engineer shall advise on bracing, shoring, underpinning, or other structural requirements. The Contractor shall bear all responsibility for prevention of movement or other structural fault.
 - 2. The Contractor shall restore, by repair or otherwise, the portions of structure or their contents altered by the Contractor in furtherance of his underpinning and support operations. Restoration shall be completed to the conditions which existed prior to the start of the work. Any damage caused by inadequate support shall also be restored by the Contractor at no cost to the Owner.
- I. Provide, erect and maintain catch platforms, lights, barriers, weather protection, warning signs, and other items as required for proper protection of the workmen engaged in demolition and alteration operations, occupants of the building, public and adjacent property. Any damage caused by the Contractor's operations shall be promptly repaired by the Contractor at no cost to the Owner.

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- J. Provide and maintain temporary protection of the existing structure designated to remain where demolition, removal, and new work are being done, connections made, materials handled, or equipment moved.
- K. Take necessary precautions to prevent dust and dirt from rising. Protect unaltered portions of the existing building affected by the operations under this Section by dustproof partitions and other adequate means.
- L. Provide adequate fire protection in accordance with local Fire Department requirements.
- M. Do not close or obstruct walkways, passageways, or stairways. Do not store or place materials in passageways, stairs, or other means of egress. Conduct operations with minimum traffic interference.
- N. Be responsible for any damage to the existing structure or contents by reason of the insufficiency of protection provided.
- O. Erect temporary covered passageways at street level as required by authorities having jurisdiction.
- P. Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the Owner.
- Q. Provide and maintain weather protection at exterior openings so as to fully protect the interior premises against damage from the elements until such openings are closed by new construction.

3.2 INSPECTION

- A. Verify that areas of demolition work are protected and that temporary dustproof partitions have been installed.
- B. Verify that construction to be removed is not load bearing or has been properly braced, framed or supported.
- C. Inspect existing conditions of the project, including elements subject to damage or to movement during demolition and cutting.
- D. After uncovering work, inspect the conditions affecting the installation or performance of the work.
 - 1. Report differing or questionable conditions to the Architect in writing; do not proceed with the work until the Architect has provided further instructions.

3.3 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or

integrity of the affected portion of the work

B. Provide devices and methods to protect other portions of the project from damage.

C. Pollution Controls

1. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
 - a. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
2. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations. Return adjacent areas to condition existing prior to the start of the work.
3. Provide drainage for temporary water use.

3.4 DEMOLITION AND CUTTING

- A. Selectively demolish existing construction in conformance with the drawings and these specifications.
1. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surface to receive installation of work by others and patching of finish surfaces.
 2. Do all cutting or removal so as to leave neat, true, plumb and square edges, at edges to remain. Use carborundum or diamond saw equipment for cutting masonry, concrete and stonework, where edges or surfaces are to remain.
 3. Do not cut or remove construction which might weaken or impair the structural integrity or strength of the structural framing or support systems which are to remain.
 4. Demolish and remove materials as shown on the drawings without damage to the remaining parts of the structure or mechanical/electrical/utility systems.
 5. Remove materials so as to not impose excessive loads in supporting walls, floors or framing and so as not to damage remaining undemolished portions of the structure.
 6. Where portions of structures are to be removed, remaining portions shall be protected from damage and prepared to fit new construction. Damage to portions of structures to remain shall be repaired.
 7. Reinforcing steel in existing structures shall be left in place, cleaned and aligned to

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provide tie with new work.

8. Existing waterproofing systems and flashings shall be carefully exposed and protected to maintain workable conditions of fitting new work with existing construction.
9. Proceed with demolition in a systematic manner.
10. Demolish concrete and masonry in small sections.
11. Remove structural framing members and lower to ground by means of hoists, derricks, or other suitable methods.

B. Shoring

1. Design, provide, erect and maintain necessary temporary shoring, bracing, framing, or support where load bearing structural or supporting members are removed or weakened by cuts or openings or are subject to damage from demolition operations, and otherwise as required for safety or to protect finish surfaces from damage.
2. Construction and adequacy of the shoring shall be the entire responsibility of the Contractor. Any damage caused by the inadequacy of the shoring or other

support shall be the responsibility of the Contractor to remedy at no additional expense to the Owner.

3. Shoring and bracing shall remain until new structural framing and/or supports are installed. Coordinate operations fully with other trades.
4. Be ready at any time to promptly provide, add to, or strengthen temporary shoring, bracing, or support for existing work, in case existing construction begins to show signs of structural stress.

3.5 WORKMANSHIP STANDARDS FOR ALTERATION AND REMOVAL WORK

- A. Cut, remove, alter, temporarily remove and replace, or relocate existing work as required for performance of the work. Perform such work required with due care, including shoring and bracing.
- B. Coordinate patching involving the various trades whether or not specifically mentioned in the respective specification Sections.
- C. Materials or items demolished and not designated to become the property of the Owner or to be reinstalled shall become the property of the Contractor and shall be removed from the Owner's property.
- D. Execute the work in a careful and orderly manner, with the least possible disturbance

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to the public and to the occupants of the adjacent buildings.

- E. In general, demolish masonry in small sections. Where necessary to prevent collapse of any construction, install temporary shores, struts, or bracing.
- F. Materials to be removed by existing elevators shall be put in enclosed containers.
- G. Where existing equipment and/or fixtures are indicated to be reused, repair such equipment and/or fixtures and refinish to put in perfect working order. Refinish as directed.
- H. Cut out embedded anchorage and attachment items as required to properly provide for patching and repair of the respective finishes.
- I. Confine cutting of existing roof areas designated to remain to the limits required for the proper installation of the new work. Cut and fold back existing roofing. Cut and remove insulation and related items. Provide temporary weathertight protection as required until new roofing and flashings are installed. Consult the Owner to ascertain if existing guarantee bonds are in force and execute the work so as not to invalidate such bonds.
- J. Where utilities are removed, relocated or abandoned, cap, valve, plug, or by-pass to make complete and working installation.
- K. Restore existing pipe and duct coverings damaged by work under this Contract to original undamaged condition.
- L. Immediately restore to service and repair any damage caused by Contractor's workmen to existing pipe and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems which are not scheduled for discontinuance or abandonment.
- M. Upon completion of contract, deliver work complete. Damage that may be caused by Contractor or Contractor's workmen to existing structures designated to remain, grounds, and utilities shall be repaired by Contractor and left in as good condition as existed prior to damaging.
- N. Restore finish work of floors, walls, and ceilings remaining in place but damaged or defaced because of demolition or alteration work to condition equal that which existed at beginning of work under this Contract.
- O. Where alteration or removals expose damaged or unfinished surfaces or materials, refinish such surfaces or materials, or remove them and provide new or salvaged materials to make continuous surfaces uniform.
- P. Perform new work and restore and refinish existing work in conformance with applicable requirements of the specifications, except as follows:

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1. Materials for use in repair of existing surfaces, but not otherwise specified, shall conform to the highest standards of the trade involved, and be in accordance with approved industry standards, and shall be as required to match existing surfaces.
 2. Workmanship for repair of existing materials shall, unless otherwise specified, be equal to similar workmanship existing in or adjacent to the space where the work is being done.
 3. Installation of salvaged items where no similar items exist shall be done in accordance with the highest standards of the trade involved and in accordance with approved shop drawings.
- Q. Materials or items designated to become the property of the Owner shall be as shown on the drawings. Remove such items with care and store them in a location at the site to be designated by the Owner.
- R. Materials or items designated to be reinstalled shall be as shown on the drawings. Remove such items with care under the supervision of the trade responsible for reinstallation; protect and store until required. Replace materials or items damaged in their removal with similar new material.
- S. The existing building shall not be used as a workshop. Neither shall the furnishings or equipment in any room be used as work benches. Should any damage occur during the progress of the work to any furniture, fixtures, equipment, or appurtenances therein, such damage shall be repaired, replaced or made good by the Contractor without extra cost to the Owner.
- T. Where removing existing floor finish and base, remove all adhesive and leave floors and walls smooth and flush, ready to receive new finish.
- U. Finish new and adjacent existing surfaces as specified for new work. Clean existing surfaces of dirt, grease and loose paint before refinishing.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General
1. Remove from the site debris, rubbish and other materials resulting from work of this Section.
 2. Burning of removed materials from demolished structures will not be permitted on the site.
- B. Removal: Transport materials removed from demolished structures and legally dispose of off-site. Pay any and all fees associated with disposal work. Leave the site in an orderly condition to the approval of the Architect.

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3.7 CLEANING UP

- A. Remove debris as the work progresses. Maintain existing premises in a neat and clean condition.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.
 - 2. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. 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. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Special concrete finish 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, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- 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.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, and testing agency.
- B. Welding certificates
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials
 - 2. Admixtures
 - 3. Form materials and form-release agents
 - 4. Steel reinforcement and accessories
 - 5. Fiber reinforcement
 - 6. Waterstops
 - 7. Curing compounds
 - 8. Floor and slab treatments
 - 9. Bonding agents

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10. Adhesives
11. Vapor retarders
12. Semirigid joint filler
13. Joint-filler strips
14. Repair materials

D. Material Test Reports: For the following, from a qualified testing agency:

1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

F. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

G. Field quality-control reports.

H. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

A. 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.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 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

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Laboratory Testing Technician, Grade II.

- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.10 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 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 (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
 - 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.
- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows:
 - 1. Maintain concrete temperature below 90 deg F (32 deg C) 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.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301 (ACI 301M).
2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

3. Overlaid Finnish birch plywood.

- B. 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.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that 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.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent

treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal
 1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Wire: ASTM A 1064/A 1064M, as drawn.
- D. Deformed-Steel Wire: ASTM A 1064/A 1064M.
- E. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as- drawn steel wire into flat sheets.
- F. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated

wire bar supports.

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type I/II.
 - 2. Fly Ash: ASTM C 618, Class F or C.
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, coarse aggregate or better, graded. Provide aggregates from a single 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.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C 260/C 260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do 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 C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- F. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
- G. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set- accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

- H. Water: ASTM C 94/C 94M and potable.

2.6 WATERSTOPS

- A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
1. Profile: Flat dumbbell with center bulb.
 2. Dimensions: 6 inches by 3/8 inch thick (150 mm by 10 mm thick); nontapered.

2.7 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.8 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: ASTM C 881, 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:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- E. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.11 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 (ACI 301M).
 1. Use a qualified independent testing agency for preparing and reporting proposed

mixture designs based on laboratory trial mixtures.

- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 50 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. See project General Notes.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. See project General Notes.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Normal-weight concrete.

- 1. See project General Notes.

2.13 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.14 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time,

quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), 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 (ACI 117M).
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct 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. Retighten 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.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, 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 (10 deg C) 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.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not 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.

3.4 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 (ACI 318M) and ACI 301 (ACI 301M) for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR-RETARDER INSTALLATION

- 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 (150 mm) and seal with manufacturer's recommended tape.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

3.6 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that 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.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- 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.

- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780/A 780M. Use galvanized-steel wire ties to fasten zinc-coated steel reinforcement.

3.7 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.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated in General Notes. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- 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. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with

shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does 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 (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 079200 "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.

3.8 WATERSTOP INSTALLATION

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- 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 (ACI 301M).
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 is 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 not to 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 (ACI 301M).
 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 (150 mm) 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.

3.10 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, or 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 1 part portland cement to 1-1/2 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 matches 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 1 part portland cement and 1 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 matches 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.

3.11 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, 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 (6 mm) in one direction.
1. Apply scratch finish to surfaces indicated.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots.
- Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces indicated.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten 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 indicated.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
 - c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
 3. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. 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.
- G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:
1. Uniformly spread 25 lb/100 sq. ft. (12 kg/10 sq. m) of dampened slip-resistive aggregate over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
 2. After broadcasting and tamping, apply float finish.
 3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.
- H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:

1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. (49 kg/10 sq. m) unless greater amount is recommended by manufacturer.
2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.12 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- 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:
 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 2. Construct concrete bases 6 inches (150 mm) high unless otherwise indicated, and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
 3. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

3.13 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) 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 (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, 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 (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - 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 does 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.
- 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.

3.14 LIQUID FLOOR TREATMENT APPLICATION

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 - 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 - 2. Do not apply to concrete that is less than 14 days' old.
 - 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.15 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 **[one]** **[six]** month(s). 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 joints clean and dry.

- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.16 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 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- 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 (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). 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 matches 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 (0.25 mm) 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 (6 mm) 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 (25 mm) 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 (19-mm) 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 (25 mm) 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.

3.17 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.

7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M 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. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
 2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing provides 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 C 143/C 143M; 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/C 231M, 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 C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.
 6. Unit Weight: ASTM C 567/C 567M, 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 C 31/C 31M.
 - 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 C 39/C 39M; 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 (3.4 MPa).
 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/C 42M 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.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 48 hours of finishing.

3.18 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

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SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the unit masonry work as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - 1. Concrete block walls and partitions.
 - 2. Metal joint reinforcing, anchors, ties, weeps, closures and related accessories for masonry.
 - 3. Control and expansion joints in masonry, filled with joint fillers.
 - 4. Chases, recesses, pockets and openings in masonry as required for installation of work by others.
 - 5. Building in of items furnished by others into masonry, including access doors, door frames, anchors, sleeves and inserts, and other similar items to be embedded in masonry.
 - 6. Grouting in of metal items built into masonry work.
 - 7. Protection, pointing and cleaning of masonry.

1.3 RELATED SECTIONS

- A. Cast-in-Place Concrete - Section 03 30 00.
- B. Joint Sealers - Section 07 92 00.
- C. Steel Doors and Frames - Section 08 11 13.

1.4 SUBMITTALS

- A. Submit Shop Drawings for the following:

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1. Anchoring details.
 2. Control and expansion joint locations and details.
- B. Submit Samples for the following:
1. Each type of sound-absorbing concrete block.
 2. Joint reinforcing, each type, width and proposed location (labeled).
 3. Anchors, wedges and ties, each type, width and proposed location (labeled).
 4. Joint filler, each type.
 5. Mortar color, 12" long cured sample.
- C. Submit technical and installation information for the following:
1. Mortar materials, each material and mortar type.
 2. Certification of mortar mix.
 3. Concrete block, joint reinforcing, anchors, ties and joint filler; submit manufacturer's technical and descriptive literature.
 4. Block manufacturer shall submit certifications of compliance with ASTM C 90, C 331 and UL 618 prior to any job site delivery. Field sampling of concrete block may be tested by an Independent Testing Laboratory retained by the Owner according to the requirements of ASTM C 140.
- D. Cleaning Procedures: Submit proposed procedures and materials for cleaning masonry work; including certification that cleaner will not adversely affect stone, gaskets, sealants, etc.

1.5 QUALITY ASSURANCE

- A. Conform to the following non-cumulative tolerances (any masonry work not meeting these standards shall be re-built as directed by the Architect).
1. Variation from the plumb:
 - a. In lines and surfaces of columns, walls and arrises:
 - 1). In 10 feet 1/8"
 - 2). In any story of 25 feet maximum 1/4"
 - b. For external corners, expansion joints and other conspicuous lines: 1).
In any story of 25 feet maximum 1/4"
 2. Variation from the level or the grades indicated on the drawings; for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines:

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- a. In any bay or 20 feet maximum 1/4"
- 3. Variation of the linear building lines from established position in plan related portion of columns and partitions:
 - a. In any bay or 20 feet maximum 1/4"
 - b. In 40 feet or more 1/2"
- 4. Variation in cross-sectional dimensions of columns and in thickness of walls:
 - a. Minus 1/8"
 - b. Plus 1/8"
- 5. Variation in dimensions of masonry openings:
 - a. Horizontal dimension -0" + 1/16"
 - b. Vertical dimension +0" - 1/16"
- B. Work of this Section shall conform to the requirements of the following:
 - 1. 2016 "Building Code Requirements for Masonry Structures," (TMS 402/602-16).
 - 2. 2016 "Specification for Masonry Structures," (TMS 602-16).
 - 3. Brick Industry Association (BIA) "Technical Notes on Brick Construction."
- C. Pre-Construction Conference: Prior to installation of masonry and associated work, Contractor shall arrange a meeting with Masonry Subcontractor, installers of related work, and other entities concerned with masonry wall performance, including the Architect and Owner. Contractor shall record discussions and agreements and furnish copy to each participant. Provide at least seventy-two (72) hours' advance notice to participants prior to convening conference. Review methods and procedures related to masonry work, including, but not limited to, the following:
 - 1. Review masonry requirements (drawings, specifications and other Contract Documents).
 - 2. Review required submittals, both completed and yet to be completed.
 - 3. Review and finalize construction schedule related to masonry work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
 - 4. Review required inspection, testing, certifying and material usage accounting procedures.
 - 5. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.

6. Coordinate work with air/vapor barrier membrane and related flashing, review details to avoid conflicts.

1.6 PRODUCT HANDLING

- A. General: Deliver, store, handle and protect all materials from damage, moisture, dirt and intrusion of foreign matter. Store all masonry units and mortar materials on raised platforms and under ventilated and waterproof cover. Store packaged materials in manufacturer's unopened containers, marked with manufacturer's name and product brand name. Immediately reseal containers after partial use. Remove and replace damaged materials.
- B. Masonry Units: Pack, deliver and store to prevent breakage, cracking, chipping, spalling or other damage. Store, protect and ventilate units at project site.
- C. Aggregate: Store with provisions for good drainage.
- D. Reinforcement and Anchors: Store and protect so that when placed, joint reinforcement and anchors will be free of soil, dirt, ice, loose rust, scale, or other coatings which would destroy or reduce bond with mortar and will not be disfigured or bent out of shape.

1.7 JOB CONDITIONS

- A. In cold weather, when the outside temperature is below forty (40) deg. F., conform to the requirements of "Cold Weather Masonry Construction and Protection Recommendations" publication by Brick Industry Association (BIA). No anti-freeze admixtures are permitted.
 1. In addition, conform to the following:
 - a. Masonry materials must be warmed as required.
- B. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg. F. and above. In addition, conform to the following:
 1. Masonry materials must be cool.
 2. Mortar must be used within 2 hours of initial mixing.
- C. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24" down both sides and hold cover securely in place.
 2. Where one wythe of multi-wythe masonry walls is completed in advance of other

wythes, secure cover a minimum of 24" down face next to unconstructed wythe and hold cover in place.

- D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

PART 2 PRODUCTS

2.1 MATERIALS

A. Standard Concrete Block

1. Portland cement, ASTM C 150, Type 1, low alkali (less than 0.6%), single source for entire project.
2. Aggregates, ASTM C 331, lightweight expanded shale, clay or slate aggregates, manufactured by the rotary kiln process equal to "Solite," "Norlite," or "Haydite."
 - a. Block scheduled to receive painted finish shall contain normal weight aggregate meeting ASTM C 33 in addition to lightweight aggregate in order to receive a smooth, uniform finish.
3. Concrete Masonry Units: Load bearing lightweight aggregate concrete masonry units conforming to the requirements of ASTM C 90, Type 1.
 - a. Block for rated walls shall be 75% solid units.
 - b. All other block may be hollow units.
4. The producer of the concrete masonry units shall furnish certification from an independent testing laboratory confirming that all 8" or larger masonry units meet all of the UL 618 requirements for two (2) hours or better (as required), referencing full scale fire test reports (ASTM E 119). All 4" and 6" units shall conform to "National Bureau of Standards" and "National Research Council" full scale fire tests.
5. Sizes and Shapes: Nominal face size 8" x 16" by thickness as indicated on drawings, with stretcher units, jamb units, header units, square corner units (at ends and corners of exposed or painted work), sash units (at control joints within

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masonry wall), lintel units and other special shapes and sizes required to complete the work.

6. Finish: For exposed or painted block surfaces, in addition to ASTM requirements, block shall have uniformly dense, flat, fine grain texture, with no cracks, chips, spalls, or other defects which would impair appearance. For concealed CMU, surfaces shall be free from deleterious materials that would stain plaster or corrode metal.
7. Curing: All concrete block shall be steam cured, and air dried for not less than thirty (30) days before delivery.
8. Density of concrete block shall not exceed one hundred and five (105) lbs. per cubic foot.
9. Shrinkage: Shrinkage of concrete blocks shall not exceed 0.065% when tested in accordance with ASTM C 426-16, Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.
10. Water Content
 - a. At the time of delivery to the job site, concrete masonry units shall have a value, in weight of contained water, of not more than thirty (30) percent of the fully saturated content for the unit tested.
 - b. Ship all units from the factory, and store at the job site, with all necessary protection to prevent increase of water content from rain and other sources.

B. Joint Reinforcing for Masonry Walls

1. For block walls forming part of exterior wall construction behind exterior stone veneer, provide super heavy-duty reinforcing fabricated of 3/16" dia. side and cross rods, truss or ladder design, ties, spaced every block course. Provide prefabricated pieces at corners and intersections of walls or partitions.
 - a. Reinforcing assembly shall be hot dip galvanized steel finish conforming to ASTM A 153 with zinc coating of 1.5 oz. of zinc per sq. ft., after fabrication.
2. For interior block walls and partitions, provide standard reinforcing fabricated of 9 ga. side and cross rods, truss or ladder design, no ties, spaced every other block course. Provide prefabricated pieces at corners and intersections of walls or partitions. Reinforcing shall be mill galvanized conforming to ASTM A 641, Class B-1, applied after fabrication.
3. Wire used in assemblies noted above shall be cold drawn steel wire conforming to ASTM A 82.
4. Approved Joint Reinforcing Manufacturers
 - a. Hohmann & Barnard

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- b. Wire-Bond
- c. Heckmann Building Products
- d. National Wire Products Industries, Inc.

C. Anchors and Ties

1. Wire Mesh: Hot-dip galvanized sixteen (16) gauge steel wire, square mesh, width 3" by length to suit condition; No. 268 by Heckmann Building Products or approved equal by manufacturer noted above in Para. D.5.
2. For anchoring CMU interior partitions to underside of steel beams, provide hot dip galvanized steel tube anchors equal to No. 419 and No. 421 made by Heckmann Building Products, No. PTA-420 made by Hohmann & Barnard, or approved equal by manufacturer noted above in Para. D.5.
3. For anchoring CMU interior partitions to underside of structural deck, provide 4" x 4" x 1/4" galvanized steel angles (ASTM A 36), 3'-0" long spaced 3'-0" o.c. alternately on each side of partition. Anchor partition securely to structural deck.

D. Reinforcing Bars and Rods: ASTM A 615, Grade 60. See Drawings for size.

E. Control and Expansion Joint Fillers

1. Vertical Installation Within Concrete Masonry Wall: Extruded high-grade neoprene rubber, cross shape, for use with concrete masonry sash units, which shall provide a force fit in the grooves of the sash block and shall have 1/2" diameter tubular ends (compressed 25% when installed in 3/8" wide joint).
 - a. Provide the following sizes:
 - 1). 2-5/8" wide control joint fillers for 4" block walls.
 - 2). 4-5/8" wide for 6" block walls.
 - 3). 6-5/8" wide for 8", 10" and 12" block walls.
 - b. Provide backer rod and sealant joint over joint filler as per drawings and Section 079200 of these specifications.
2. Isolation Joint Filler at Abutting Construction and at Intersecting CMU Walls: Compressible and resilient closed cell neoprene gasket with pressure sensitive adhesive backing, thickness 30% greater than thickness of joint. Acceptable joint filler shall be "Everlastic, Type NN-1" by Williams Products, Inc., or approved equal. Recess joint filler and install backer rod and sealant as per drawings and Section 079200 of these specifications.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type 1, standard color, one source.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Aggregate for Mortar: Clean, washed, buff colored sand, graded per ASTM C 144.

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- D. Aggregate for Grout: ASTM C 404.
- E. Water: Clean, fresh and suitable for drinking.

2.3 MORTAR MIX

- A. Exterior Block Back-Up Construction: Provide Portland cement/lime mortar as noted above conforming to ASTM C 270, Type N.
- B. Interior Masonry Construction: Provide Portland cement/lime mortar conforming to ASTM C 270, Type N, for load bearing conditions, mortar shall conform to ASTM C 270, Type M.
- C. Reinforced Concrete Block: Provide Portland cement/lime mortar conforming to ASTM C 270, Type S.
- D. Mortar for Cement Cants: One (1) part Portland cement and four (4) parts sand, by volume.
- E. Grout for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of unit masonry. Use grout of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Grout shall have a minimum compressive strength of 3000 psi when tested in accordance with ASTM C 1019.
- F. Mixing
 - 1. General: Add cement just before mixing and mix dry. Use sufficient amount of water as necessary to produce workable mix. Mix in small batches to make plastic mass.
 - 2. Mixing: Machine mix all mortars in approved type mixer with device to accurately and uniformly control water. Add hydrated lime dry. Mix dry materials not less than two (2) minutes. Add water, then mix not less than three (3) minutes, not to exceed five (5) minutes. Mix only amount of mortar that can be used before initial set. Do not use mortar which has reached its initial set or two (2) hours after initial mixing, whichever comes earlier. Mortar may not be re-tempered. Clean mixer for each batch, whenever mortar type is changed, and at end of each day's work.
 - 3. Acceleration or other admixtures not permitted.
 - 4. Mortar shall have a flow after suction of not less than seventy-five (75) percent of that immediately after mixing as determined by ASTM C 91.
- G. Admixtures
 - 1. No air-entraining admixtures or cementitious materials containing air-entraining admixtures shall be used in the mortar.
 - 2. No antifreeze compounds or other substances shall be used in the mortar to lower the freezing point.

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3. Calcium chloride or admixtures containing calcium chloride shall not be used in mortar.

2.4 MASONRY ACCESSORIES

- A. Neoprene Joint Filler: Provide closed cell neoprene, Type NN-1, conforming to ASTM D 1056, Grade 1, high performance, as manufactured by Williams Products Inc., or equal made by D. S. Brown, Norton, or approved equal.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection
 1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 2. Verify that masonry may be completed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.
 3. Do not start any work until mock-ups are approved by the Architect.
- B. Discrepancies
 1. In the event of discrepancy, immediately notify the Architect in writing.
 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
 3. Starting of work by the Contractor means acceptance by the Contractor of the substrate.

3.2 COORDINATION

- A. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

3.3 PREPARATION

- A. Concrete Block: Do not wet concrete block units.

3.4 INSTALLATION

- A. General
 1. Build walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown.

2. Build chases and recesses as shown or required for the work of other trades.
3. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
4. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and off-sets. Avoid the use of less than half size units at corners, jambs and wherever possible.
5. Layup walls plumb and true with courses level, accurately spaced and coordinated with other work.
6. Pattern Bond: Lay exposed masonry patterns as noted on drawings. If not shown, provide running bond. Lay concealed concrete block with all units in a wythe bonded by lapping not less than two (2) inches. Bond and interlock each course of each wythe at corners. Do not use units of less than four (4) inches horizontal face dimensions at corners or jambs.
7. Where possible, masonry walls and partitions shall be built after all overhead ducts, pipes and conduits are in place and tested. Masonry shall be neatly built around the items above. Walls and partitions shall be plumb, true to line and free from defects such as open cells, voids, dry joints and other similar defects. In rooms and spaces scheduled to have concrete block finish, all such surfaces including upper wall surfaces up to termination of structural ceiling in spaces without suspended ceilings, shall be made suitable for paint application. Cutting of openings in walls and partitions in place shall be done only with the approval of the Architect.
8. Mortar, ties and reinforcement must not extend into or bridge any expansion joints.

B. Mortar Bedding and Jointing

1. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on exterior walls and in all courses of piers, columns and pilasters, where solid CMU is used and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
2. Lay masonry walls with 3/8" joints unless otherwise shown on drawings.
3. Tool exposed joints slightly concave after the mortar joint is thumbprint hard. Concealed joints shall be struck flush.
4. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

C. Stopping and Resuming Work: Rake block 1/2 block length in each course; do not

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tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

D. Built-In Work

1. As the work progresses, build in items specified under this and other Sections of these specifications. Fill in solidly with masonry around built-in items.
2. Mortar in door frames, access doors, louvers and other metal items embedded or built into masonry work solidly with mortar as the masonry units are laid up.
3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed grout.
4. Sleeves, pipes, ducts and all other items which pass through masonry walls shall be caulked with interior grade sealant meeting requirements of Section 079200, so as to be air tight and prevent air leakage. Refer to Section 078413 for packing of voids in rated masonry walls.
5. Fill vertical cells of masonry units solid with grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell including stone anchors and window or curtain wall anchors.
6. Fill vertical cells of masonry units solid with mortar on each side of door frames to sixteen (16) inches beyond.
7. Unless otherwise noted, fill vertical cells of masonry units solid with grout which are below steel bearing plates, steel beams, and ends of lintels, to eight (8) inches beyond bearing and from floor to bearing.
8. Place wire mesh in horizontal joint below masonry unit cells to be filled with mortar, to prevent mortar from dropping into unfilled cells below.
9. Masonry indicated as being reinforced shall have all voids filled solid with grout. Grout shall be consolidated in place by vibration or other methods which insure complete filling of cells. When the least clear dimension of the grouted cell is less than two (2) inches, the maximum height of grout pour shall not exceed twelve (12) inches. When the least clear dimension is two (2) inches or more, maximum height of grout pour shall not exceed forty-eight (48) inches. When grouting is stopped for one (1) hour or longer, the grout pour shall be stopped 1-1/2" below the top of a masonry unit. Vertical bar reinforcing shall be accurately placed and held in position while being grouted and shall be in place before grouting starts. All such reinforcing shall have a minimum clear cover of 5/8". Lap all bars a minimum of forty (40) bar diameters and provide steel spacer ties (not to exceed 192 bar diameter) to secure and position all vertical steel and prevent displacement during grouting. Provide continuous horizontal reinforcement embedded in mortar joints every second course.

E. Cutting and Patching

1. All exposed masonry which requires cutting or fitting shall be cut accurately to size with motorized carborundum or diamond saw, producing cut edges.
2. Holes made in exposed masonry units for attachment of handrail brackets and similar items shall be neatly drilled to proper size.
3. All masonry which requires patching in exposed work, if approved by Architect, shall be patched neatly with mortar to match appearance of masonry as closely as possible and to the Architect's satisfaction. Rake back joints and use pointing mortar to match as required.

F. Solid Wall Construction

1. Fill the vertical longitudinal joint between wythes solidly with mortar by parging the in-place wythe and shoving units into the parging.
2. Tie wythes with continuous horizontal reinforcement embedded in mortar joints sixteen (16) inches o.c. vertically.

G. Interior Block Partitions

1. Build to full height unless otherwise shown on drawings. At non-rated partitions fill void between CMU and structural deck with continuous neoprene filler as specified herein. At fire rated partitions, fill void with fire stop material meeting the requirements of Section 078413. Fasten to structure at top of partition using steel angles as specified herein.
2. Provide continuous horizontal joint reinforcing every other block course, except as otherwise noted. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8". Lap reinforcement a minimum of six (6) inches at ends of units.
3. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
4. Corners
 - a. Provide interlocking masonry unit bond in each course at corners.
 - b. Provide continuity at corners with prefabricated "L" reinforcement units, in addition to masonry bonding.
5. Intersecting and Abutting Walls
 - a. Unless vertical control joints are shown as part of structural frame, provide interlocking masonry bond. Provide starters and special shapes as shown on the drawings to bond these walls.
 - b. In addition to masonry bonding, provide horizontal reinforcement using prefabricated "T" units at interior partitions.

H. Ties and Anchors for Masonry Construction

1. Provide ties and anchors as shown or specified, but not less than one metal tie, spaced not to exceed sixteen (16) inches o.c. horizontally and/or vertically. Provide additional ties within 1'-0" of all openings and adjacent to expansion joints and spaced not more than 16" apart around perimeter of openings.
2. Anchoring Masonry to Structure: Provide an open space not less than 1/2" in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.

I. Control and Expansion Joints

1. Provide expansion, control and isolation joints in masonry as shown. Build in related items as the masonry work progresses.
2. CMU Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 40'-0" o.c. In addition, locate joints at points of natural weakness in the masonry work, including the following:
 - a. At structural column or joint between bay.
 - b. Above control joints in the supporting structure.
 - c. Above major openings at end of lintels upward and below at ends of sills downward. Place at one side of jamb for openings not less than 6'-0" wide and at both sides for openings over 6'-0" wide.
 - d. At reduction of wall thickness.
 - e. Where masonry abuts supporting structure.
 - f. If additional joints are required, indicate same on approved shop drawings.

J. Lintels

1. For concrete block walls, use specially formed U-shaped concrete block lintel units with reinforcing bars in accordance with the following table, filled with grout.

Number and Size of Reinforcing Bars Required at Concrete Block Lintels		
Maximum Clearance Span	Wall Width	Rebar No. - Size
2'-0" to 6'-0" 6'-0" to 8'-0"	6"	2 - #3 2 - #4
2'-0" to 6'-0" 6'-0" to 8'-0"	8"	2 - #3 2 - #4
2'-0" to 6'-0" 6'-0" to 8'-0"	12"	3 - #3 3 - #4

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2. U-shaped concrete block lintels shall extend a minimum of 8" at each side of opening.

3.5 CLEANING, PROTECTION, ADJUSTMENT

A. Protection

1. The Contractor shall take adequate precautions for the protection of all surfaces against mortar spatter and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.
2. Excess mortar shall be wiped off the masonry surfaces as the work progresses.
3. Wood coverings shall be placed over all such masonry surfaces as are likely to be damaged during the progress of the entire project.
4. Protective measures shall be performed in a manner satisfactory to the Architect.
5. Damaged masonry units shall be replaced to satisfaction of the Architect.
6. Exterior masonry walls shall be draped with waterproof covering until copings are in place, to prevent water penetration in cavity.

- B. Cleaning of Masonry: Upon completion, all exposed masonry shall be thoroughly cleaned following recommendations of the BIA Technical Note No. 20. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately 4' x 4' in a location approved by the Architect. No further cleaning work may proceed until the sample area has been approved by the Architect, after which time the same cleaning materials and method shall be used on the remaining wall area. If stiff brushes and water do not suffice, the surface shall be thoroughly saturated with clear water and then scrubbed with a solution of an approved detergent masonry cleaner, equal to "Vana Trol" made by ProSoCo Inc. or equal made by Diedrich or approved equal, mixed as per manufacturer's directions, followed immediately by a thorough rinsing with clear water. All lintels and other corrodible parts shall be thoroughly protected during cleaning.

1. Unless otherwise required by cleaning agent manufacturer use only low-pressure device (30 to 50 psi) for application of cleaning agent and water rinsing.

- C. Pointing: Point any defective joint with mortar identical with that specified for that joint.

END OF SECTION

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SECTION 04 72 00

CAST STONE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the cast stone as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - 1. Cast stone copings, bands, lintels, sills, surrounds, etc. on building façade.
 - 2. Mortar.
 - 3. Anchors and accessories.
 - 4. Joint filler.

1.3 RELATED SECTIONS

- A. Unit Masonry - Section 04 20 00.
- B. Joint Sealers - Section 07 92 00.

1.4 QUALITY ASSURANCE

- A. Qualifications of Workmen
 - 1. For the actual cutting and placing of cast stone units, use only skilled journeyman masons who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the design requirements.
 - 2. In acceptance or rejection of installed cast stone units, no allowance will be made for lack of skill on the part of workmen.
- B. Manufacturer shall have a minimum of ten (10) years' experience in the manufacture of cast stone. Manufacturer's products must have previously been used on the exterior with satisfactory results. Manufacturer must have capability to produce cast stone on schedule and must be a member of the Cast Stone Institute.
- C. Casting Tolerances: Maintain casting, bowing, warping and dimension tolerance within

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the following maximums:

1. Overall Dimension For Height and Width of Units: Plus zero of unit dimension to minus 3/32" for 10'-0" and over.
 2. Twist, Bowing or Warping: Do not exceed length/360 or 1/8", whichever is greater.
 3. Insert Locations: Place within plus or minus 1/8" in each direction.
 4. Length of units shall not deviate by more than +/- 1/8" from approved dimensions.
- D. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ASTM C 1364 Standard Specification for Architectural Cast Stone, except where more stringent standards are specified herein.
 2. ASTM C 150 Specification for Portland Cement.
 3. ASTM C 33 Specification for Concrete Aggregates
 4. ASTM C 979 Specification for Coloring Pigments for Integrally Pigmented Concrete.
 5. ASTM C 494 Specification for Concrete Admixtures
 6. ASTM A 615 Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
 7. ASTM C 1194 Test Method for Compressive Strength of Architectural Cast Stone.
 8. ASTM C 1195 Test Method for Absorption of Architectural Cast Stone.
 9. ASTM C 642 Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete.
 10. ASTM C 39 Test Method for Compressive Strength of Concrete Cylinders.
 11. ASTM D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- E. Testing: Test three specimens per 500 cubic feet at random from plant production in accordance with referenced standards.
- F. Cold weather setting practices shall conform to the requirements specified in Section 042000.

1.5 SUBMITTALS

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- A. Submit samples of cast stone with documented independent testing laboratory reports to the Architect for approval.
- B. Samples: Before any cast stone materials are delivered to the job site, submit twelve (12) inch long samples of each profile type cast stone unit required.
 - 1. Submit 6" x 6" cast stone samples showing full range of colors and texture available.
- C. Shop Drawings: Submit complete shop drawings of all cast stonework showing anchorage, type, location and spacing, joint fillers, mortar, and cast stone profiles, sizes, connections, location, type and size of reinforcing and adjacent construction.
 - 1. The shop drawings shall show the setting mark of each stone and its location on the structure. The stone when delivered shall bear the same corresponding setting mark on an unexposed surface.
 - 2. Shop drawings must show exact profiles for each piece.
- D. Certification: Submit certification from an independent testing laboratory certifying to test results required under Article 1.4, Para. E. herein.

1.6 MOCK-UP

- A. Provide full size unit(s) for use in construction of wall mock-up specified in Section 042000. The mock-up becomes the standard of workmanship for the project.

1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect cast stone and related materials before, during, and after installation, and to protect the installed work and materials of all other trades.
 - 1. Stone shall be stored on skids, off the ground and covered with plastic sheeting; all material in contact with stone shall be non-staining.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 CAST STONE

- A. The Cast Stone used in this work shall match color and texture of samples approved by the Architect. The samples shall be approved by the Architect prior to fabrication of cast stone.
- B. Exposed surfaces, unless otherwise specified, shall exhibit a typically fine-grained

texture similar to natural stone. No bug holes will be permitted and all facing material shall be mixed in a muller mixer.

- C. Cast Stone used in this work shall conform to the following properties:
1. Compressive Strength, ASTM C 1194: 7,000 psi min. for products at 28 days.
 2. Absorption, ASTM C 1195 or ASTM C 642: 5% max. for products at 28 days.
 3. Cumulative Percent Weight Loss (CPWL) shall be less than 5% after 300 freeze/thaw cycles when tested in accordance with ASTM C 1364.
 4. Air Content: ASTM C 173 or C 231, for wet cast product only shall be 4-8%. Air entrainment is not required for dry cast products.
 5. Linear Shrinkage: ASTM C 426: Shrinkage shall not exceed 0.065%.
 6. Color Variation
 - a. Must match color and finish of approved sample when viewed in direct daylight at a 5-foot distance.
 - b. ASTM Color Variation Allowed: 2% hue; 6% lightness, chrome and hue combined.

2.2 MATERIALS

- A. Cement shall be Portland Type I white, meeting ASTM C 150.
- B. Fine aggregate shall be carefully graded and washed natural sands, or manufactured granite, marble, quartz or limestone sands meeting ASTM C 33, except that gradation may vary to achieve desired finish and texture.
- C. Coarse aggregate shall be carefully graded and washed natural gravel, or crushed graded stone such as granite, marble quartz, limestone or other durable stone meeting ASTM C 33, except that gradation may vary to achieve desired finish and texture.
- D. Coloring: All colors added shall be inorganic (natural or synthetic) iron oxide pigments meeting ASTM C 979 excluding the use of a cement grade of carbon black pigment and shall be guaranteed by the manufacturer to be light fast and lime proof. The amount of pigment shall not exceed ten (10) percent by weight of the cement used. Colorant shall be manufactured by Davis Colors or approved equal.
- E. Cast stone shall be reinforced with new billet steel reinforcing bars meeting ASTM A 615, grade 60, when necessary for safe handling, setting and structural stress, and the size of the reinforcing shall be as shown on approved shop drawings. If the surfaces are to be exposed to the weather, the reinforcement shall be galvanized or epoxy- coated when covered with less than two (2) inches of material for bars larger than 5/8 inch and 1-1/2 inches for bars 5/8 inch or smaller. The material covering in all cases shall be at least twice the diameter of the bars. Stone shall be fully reinforced to take all

stresses including handling, temperature changes and structural stress.

- F. All anchors, dowels and other anchoring devices shall be furnished by the stone setter as shown on approved shop drawings using building stone anchors fabricated of stainless-steel Type 304.

- 1. Anchors shall allow for wracking of the structure (seismic) without stressing the cast stone units.

2.3 FABRICATION

- A. Cast stone, after being made, shall be cured as noted below in Article 2.5.
- B. Cast stone shall be "dry cast" or "wet cast" (depending upon selected finish) to produce sharp arrises to match profiles on approved shop drawings. Provide stone with sinkages to receive anchors.
- C. Cast stone for copings shall be fabricated to largest practical length, as shown on approved shop drawings.
- D. Acid etch exposed surfaces as required to remove cement film prior to packaging and shipment. Sandblasting or chemical retardation finishing is not permitted.

2.4 CURING

- A. Cure units in a warm curing chamber approximately 100 deg. F. at 95% relative humidity for approximately 12 hours, or cure in a 95% moist environment at a minimum 70 deg. F. for 16 hours after casting. Additional yard curing at 95% relative humidity shall be 350 degree days (i.e. 7 days at 50 deg. F. or 5 days at 70 deg. F. prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

2.5 ACCESSORIES

- A. Mortar for setting of cast stone sections shall conform to ASTM C 270, Type N, with not more than 1/2 part lime per part of white non-staining Portland cement with integral colorant as required to match color of stone.
- B. Joint Filler: Fill all joints with exposed tops with "Emseal" Greyflex Expanding Foam Sealant as manufactured by Emseal, Inc. or approved equal. Material shall be designed for compression in joint twenty-five (25) percent of its original width, depth of filler as per manufacturer's standard. Joint filler shall be recessed 3/4" from finished surface.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where cast stone is to be installed and correct any

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conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

3.3 JOINTING

- A. Joint Size: 3/8", unless otherwise noted.
- B. Joint Material
 - 1. Use a full bed of mortar at all bed joints.
 - 2. Flush vertical joints full with mortar.
 - 3. Leave all joints with exposed tops open for sealant.
- C. Location of Joints: As shown on approved shop drawings.

3.4 SETTING

- A. All cast stone shall be set by experienced stone masons, accurately and in accordance with the shop and setting drawings. All anchors and dowels shall be firmly placed and all anchor holes and dowel holes and similar holes filled completely with mortar. Cast stone anchors shall be fastened only to concrete, fully grouted CMU, or cold formed metal framing, using anchors appropriate for each substrate.
- B. Setting Tolerances: Plus/minus 1/32" allowable out of plane with adjacent units.
- C. When setting with mortar, all stones not thoroughly wet shall be drenched with clear water just prior to setting.
- D. All stone shall be protected from splashing mortar or damage by other trades. Any foreign matter splashed on the stone shall be removed immediately.
- E. All joints with exposed tops shall be filled with joint filler specified herein recessed 3/4" from stone surface; balance of joint shall be filled with back-up rod and sealant by Section 079200.

3.5 PATCHING

- A. The repair of chipped or damaged cast stone shall be done only by mechanics skilled in this class of work, with materials furnished by the manufacturer and according to his direction.
- B. Patching will not be permitted on copings and any other piece which can be removed

and replaced without undue difficulty. Replace such pieces which are chipped or damaged with identical new pieces. Reseal and/or repoint to remove any evidence of replacement.

- C. Cast stone shall show no obvious repairs or imperfections other than minimal color variations when viewed with the unaided eye under good typical lighting at a ten (10) foot distance.

3.6 CLEANING

- A. Before pointing, the face of all cast stone shall be scrubbed with a fiber brush, using soap powder and water and shall then be rinsed thoroughly with clean running water. Any mortar on the face of the cast stone shall be removed. No acids or prepared cleaners shall be used without the approval of the cast stone manufacturer.

3.7 POINTING

- A. When ready for tuck pointing, the mortar joints shall be dampened and raked back 3/4" for pointing. Pointing shall form a slight concave profile. No pointing shall be done in freezing weather nor in locations exposed to hot sun unless properly protected. Pointing mortar shall be composed of one (1) part non-staining cement (ASTM C 91), one (1) part hydrate lime (ASTM C 207, Type S) and four (4) parts of clean, washed sand (ASTM C 144). Coloring pigments shall be added as specified in Section 042000 for face brick construction. The Architect shall approve color of pointing mortar before proceeding with pointing.

3.8 PROTECTION

- A. All projecting cast stone pieces shall be fully protected when installed against damage of any kind. Any piece damaged shall be replaced at no additional cost.

3.9 INSPECTION AND ADJUSTMENT

- A. Upon completion of the work, make a thorough inspection of all installed cast stone and verify that all units and joints have been installed in accordance with the provisions of this Section; make all necessary adjustments.

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SECTION 07 92 00

JOINT SEALERS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the joint sealers work as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
 - 1. Flashing reglets and retainers.
 - 2. Exterior wall joints not specified to be sealed in other Sections of work.
 - 3. Interior wall joints not specified to be sealed in other Sections of work, including caulking to fill between architectural woodwork and any wall, floor and/or ceiling imperfections.
 - 4. Control and expansion joints in walls.
 - 5. Joints at wall penetrations.
 - 6. Joints between items of equipment and other construction.
 - 7. All other joints required to be sealed to provide a positive barrier against penetration of air and moisture.

1.3 RELATED SECTIONS

- A. Aluminum Windows - Section 08 51 13

1.4 QUALITY ASSURANCE

- A. Qualification of Installers: Use only personnel who are thoroughly familiar, skilled and specially trained in the techniques of sealant work, and who are completely familiar with the published recommendations of the sealant manufacturer.
- B. Pre-Construction Field Adhesion Testing: Before installing elastomeric sealants, field

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test their adhesion to project joint substrates according to the method in ASTM C 794 and C 1521 that is appropriate for the types of Project joints.

- C. Perform testing per ASTM C 1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work shall start until results of these tests have been submitted to the Architect and he has given his written approval to proceed with the work.
- D. VOC Limits: Comply with Adhesives, Sealants, and Sealant Primers VOC Limits Tables, CI 2009 (usgbc.org).

1.5 SUBMITTALS

- A. Shop Drawings: Submit shop drawings showing all joint conditions, indicating relation of adjacent materials, all sealant materials (sealant, bond breakers, backing, primers, etc.), and method of installation.
 - 1. Submit joint sizing calculations certifying that movement capability of sealant is not being exceeded.
- B. Samples: Submit the following:
 - 1. Color samples of sealants, submit physical samples (not color chart).
 - 2. Sealant bond breaker and joint backing.
- C. Product Data: Submit manufacturer's technical information and installation instructions for:
 - 1. Sealant materials, indicating that material meets standards specified herein.
 - 2. Backing rods.
- D. Submit manufacturer's certification as required by Article 1.6 herein.
- E. Submit results of testing required in Article 1.4 herein.

1.6 MANUFACTURER'S RESPONSIBILITY AND CERTIFICATION

- A. Contractor shall require sealant manufacturer to review the Project joint conditions and details for this Section of the work. Contractor shall submit to the Architect written certification from the sealant manufacturer that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vaportight seals (as applicable), and that materials supplied meet specified performance requirements.

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1.7 ENVIRONMENTAL CONDITIONS

- A. Temperature: Install all work of this Section when air temperature is above forty (40) degrees F. and below eighty (80) degrees F., unless manufacturer submits written instructions permitting sealant use outside of this temperature range.
- B. Moisture: Do not apply work of this Section on surfaces which are wet, damp, or have frost.

1.8 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section, before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Storage
 - 1. Store sealant materials and equipment under conditions recommended by their manufacturer.
 - 2. Do not use materials stored for a period of time exceeding the maximum recommended shelf life of the material.
 - 3. Material shall be stored in unopened containers with manufacturers' name, batch number and date when shelf life expires.

1.9 WARRANTY

- A. Provide a written, notarized warranty from the manufacturer stating that the applied sealants shall show no material failure for a period of ten (10) years.
- B. Contractor to provide a written, notarized warranty stating that the applied sealants shall show no failure due to improper installation for a period of five (5) years.
- C. Warranty shall be in a form acceptable to the Owner and executed by an authorized individual.
- D. Include in warranty provision agreement to repair and/or replace, at Contractor's expense, sealant defects that develop during warranty period as a result of faulty labor and/or materials.

PART 2 PRODUCTS

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2.1 SEALANT MATERIALS

- A. Exterior Wall Sealant: Provide one (1) part non-sag sealant equal to No. 790 or 795 made by Dow Corning, "Silpruf SCS 2000" or "LM SCS 2700" made by G.E., "Spectrem 1" or "Spectrem 3" made by Tremco or "Sonolastic 150" by Sonneborn conforming to the minimum standards of ASTM C 920, Type S, Grade NS, Class 50.
- B. Interior Sealant: Provide a one (1) part acrylic-based sealant conforming to ASTM C 834, equal to "AC-20+ Silicone" made by Pecora, Masterseal NP 520 by BASF or equal made by Tremco.
- C. Colors: Colors selected from manufacturer's standard selection.

2.2 MISCELLANEOUS MATERIALS

- A. Back-Up Materials: Provide back-up materials and preformed joint fillers, non-staining, non-absorbent, compatible with sealant and primer, and of a resilient nature, equal to "HBR" made by Nomaco Inc. or approved equal, twenty-five (25) percent wider than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used. Provide back-up materials only as recommended by sealant manufacturer in writing.
- B. Provide bond breakers, where required, of polyethylene tape as recommended by manufacturer of sealant.
- C. Provide primers recommended by the sealant manufacturer for each material to receive sealant. Note that each exterior joint must be primed prior to sealing.
- D. Provide solvent, cleaning agents and other accessory materials as recommended by the sealant manufacturer.
- E. Materials shall be delivered to the job in sealed containers with manufacturer's original labels attached. Materials shall be used per manufacturer's printed instructions.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where joint sealers are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with instructions and recommendations of the manufacturer and in accordance with ASTM C 1193 for use of joint sealants as

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applicable to materials, applications and conditions required by this Project where more stringent installation requirements are specified herein, such requirements shall apply.

B. Sample Section of Sealant

1. During sealant installation work in exterior wall, the manufacturer of sealant shall send his representative to the site, under whose supervision a section of the wall (used as "control section") shall be completed for purposes of determining performance characteristics of sealant in joints. Architect shall be informed of time and place of such installation of control section.
2. Control section shall be installed according to specification given herein and shall not be considered as acceptable until written acceptance is provided by the Architect.
3. Accepted control section shall be standard to which all other sealant work must conform.

C. Supervision: The Contractor shall submit to the Architect written certification from the sealant manufacturer that the applicators have been instructed in the proper application of their materials. The Contractor shall use only skilled and experienced workmen for installation of sealant.

D. Apply sealant under pressure with a hand or power actuated gun or other appropriate means. Gun shall have nozzle of proper size and provide sufficient pressure to completely fill joints as detailed. Neatly point or tool joint to provide the contour as indicated on the drawings.

E. Preparation and Application

1. Thoroughly clean all joints, removing all foreign matter such as dust, oil, grease, water, surface dirt and frost. Sealant must be applied to the base surface. Previously applied film must be entirely removed.
2. Stone, masonry and concrete surfaces to receive sealant shall be cleaned where necessary by grinding, water blast cleaning, mechanical abrading, or combination of these methods as required to provide a clean, sound base surface for sealant adhesion.
 - a. Do not use any acid or other material which might stain surfaces.
 - b. Remove laitance by grinding or mechanical abrading.
 - c. Remove loose particles present or resulting from grinding, abrading, or blast cleaning by blowing out joints with compressed air, oil and water free, or vacuuming joints prior to application of primer or sealant.
3. Clean non-porous surfaces such as metal and glass chemically. Remove protective coatings on metallic surfaces by solvent that leaves no residue and is

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compatible with sealant. Use solvent and wipe dry with clean, dry lint free paper towels. Do not allow solvent to air dry without wiping. Clean joint areas protected with masking tape or strippable films as above after removal of tape film.

4. Do not seal joints until they are in compliance with drawings, or meet with the control section standard.
5. Joint Size and Sealant Size: Joints to receive sealant shall be at least 1/4" wide. In joint 1/4" to 3/8" wide, sealant shall be 1/4" deep. In joints wider than 3/8" and up to 1" wide, sealant depth shall be one half the joint width. For joints wider than 1", sealant depth shall be as recommended by the sealant manufacturer. Depth of joint is defined as distance from outside face of joint to closest point of the filler.
6. Primer: Thoroughly clean joints and apply primer to all surfaces that will receive sealant. Apply primer on clean, dry surfaces, and prior to installation of joint backing. Completely wet both inner faces of the joint with primer. Mask adjacent surfaces of joint with non-staining masking tape prior to priming. Apply primer with clean brush and only when temperature is above 45 deg. F.
7. Joint Backing: In joints where depth of joint exceeds required depth of sealant, install joint backing (after primer is dry) in joints to provide backing and proper joint shape for sealant. Proper shape for sealant is a very slight "hourglass" shape, with back and front face having slight concave curvature. Use special blunt T-shaped tool or roller to install joint backing to the proper and uniform depth required for the sealant. Joint backing shall be installed with approximately twenty-five (25) percent compressions. Do not stretch, twist, braid, puncture, or tear joint backing. Butt joint backing at intersections.
8. Bond Breaker: Install bond breaker smoothly over joint backing so that sealant adheres only to the sides of the joint and not backing.
9. Sealant Application: Apply sealant in accordance with the manufacturer's application manual and manufacturer's instructions, using handguns or pressure equipment, on clean, dry, properly prepared substrates, completely filling joints to eliminate air pockets and voids. Mask adjacent surfaces of joint with non-staining masking tape. Force sealant into joint in front of the tip of the "caulking gun" (not pulled after it) and force sealant against sides to make uniform contact with sides of joint and to prevent entrapped air or pulling of sealant off of sides. Fill sealant space solid with sealant.
10. Tooling: Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C 1193. Finished joints shall be straight, uniform, smooth and neatly finished. Remove masking tape immediately after tooling of sealant and before sealant face starts to

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"skin" over. Neatly remove any excess sealant from adjacent surfaces of joint, leaving the work in a neat, clean condition.

11. Replace sealant which is damaged during construction process.

END OF SECTION

SECTION 081113

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

SUMMARY

1.2 SECTION INCLUDES:

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the cast stone as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - 1. Standard and custom hollow metal doors and frames.
 - 2. Steel sidelight, borrowed lite and transom frames.
 - 3. Louvers installed in hollow metal doors.
 - 4. Light frames and glazing installed in hollow metal doors.

1.3 RELATED SECTIONS:

- 1. Unit Masonry - Section 04 20 00
- 2. Glass & Glazing – Section 08 80 00
- 3. Door Hardware – Section 08 71 00

1.4 REFERENCES:

- A. Comply with the recommendations of the following references unless more stringent requirements are indicated herein.
 - 1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
 - 2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
 - 3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
 - 4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

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5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
11. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
12. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
13. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
14. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
15. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
16. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
17. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Energy Efficient Exterior Openings: Comply with minimum thermal ratings, based on ASTM C1363. Openings to be fabricated and tested as fully operable, thermal insulating door and frame assemblies.
 1. Thermal Performance (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM C1363 and meet or exceed the following requirements:
 - a. Door Assembly Operable U-Factor and R-Value Ratings: U-Factor 0.29, R-Value 3.4, including insulated door, thermal-break frame and threshold.

2. Air Infiltration (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM E283 to meet or exceed the following requirements:

- a. Rate of leakage of the door assembly shall not exceed 0.25 cfm per square foot of static differential air pressure of 1.567 psf (equivalent to 25 mph wind velocity).

- F. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.9 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
 - 1. CECO Door Products (C).
 - 2. Curries Company (CU).
 - 3. Pioneer Industries (PI).

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Exterior Doors (Energy Efficient): Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.
 - 1. Design: Flush panel.
 - 2. Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 "Laminated Core".
 - a. Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" on-center to integral core assembly, foamed in place polyurethane core

- chemically bonded to all interior surfaces. No stiffener face welding is permitted.
 - b. Thermal properties to rate at a fully operable minimum U-Factor 0.29 and R-Value 3.4, including insulated door, thermal-break frame and threshold.
 - c. Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.36 and R-Value 2.7, including insulated door, kerf type frame, and threshold.
- 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053 inch - 1.3-mm) thick steel, Model 2.
 - 4. Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 - 5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 - 6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".
 - 7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
- 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 - 3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
 - 4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
 - 5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
 - 6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Manufacturers Basis of Design:
- 1. Curries Company (CU) - Polystyrene Core - 707 Series.
 - 2. Curries Company (CU) - Energy Efficient - 777 Trio-E Series.

2.4 SPECIAL FUNCTION HOLLOW METAL DOORS

- A. Sound Resistant Doors: Subject to the same compliance standards and requirements as standard hollow metal doors, provide manufacturer's standard sound resistant acoustic core tested in accordance with ASTM E90, ASTM 413, and ASTM E1332 standards. Fabricate with minimum 16 gauge construction, 1-3/4" thickness, combined with standard flush frames designed for mid-range and high range sound attenuation from STC 39 through STC 52 applications. Furnish complete with perimeter sound seals, bottom seals, and threshold as required for specified STC rating.
1. Provide sound resistant doors with minimum STC sound rating (32, 38, 41, 43, 46, 50, 52, 54) as indicated on the door schedule:
 2. Each unit to bear a physical label applied to door certifying the product construction and identifying the specific STC rating.
 3. Manufacturers Basis of Design:
 - a. CECO Door Products (C) - Sound-Tech Express Series.
 - b. Curries Company (CU) - 757 Quiet Noise Series.

2.5 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16" positive thermal break and integral vinyl weatherstripping.
- C. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
 - a. Curries Company (CU) – M Series.
- D. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.

- E. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.6 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.7 LOUVERS

- A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
 - 1. Blade Type: Vision proof inverted V or inverted Y.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.
- B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
 - 1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.8 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed

independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.9 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.10 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 - 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 - 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Electrical Knock Out Boxes: Factory weld 18 gauge electrical knock out boxes to frame for electrical hardware preps; including but not limited to, electric through wire transfer hardware, electrical raceways and wiring harnesses, door position switches, electric strikes, magnetic locks, and jamb mounted card readers as specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".
 - a. Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.
 - b. Conduit to be coordinated and installed in the field (Division 26) from middle hinge box and strike box to door position box.
 - c. Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Section "Door Hardware".
 - d. Electrical knock out boxes for continuous hinges should be located in the center of the vertical dimension on the hinge jamb.
9. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
10. Jamb Anchors: Provide number and spacing of anchors as follows:

- a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
 - 11. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
 - 12. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
- 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 - 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 - 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.11 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

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SECTION 08 14 16

WOOD DOORS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the wood doors as shown on the drawings and/or specified herein, including but not limited to, the following:
 - 1. Solid core flush wood doors.

1.3 RELATED SECTIONS

- A. Hollow metal frames - Section 081113.
- B. Finish hardware - Section 087100.
- C. Painting & Finishing – Section 099000.

1.4 SUBMITTALS

- A. Product Data: Submit door manufacturer's product data, specifications and installation instructions for each type of wood door.
 - 1. Include details of core and edge construction and trim for openings.
 - 2. Include factory finish specifications.
 - 3. Include certifications to show compliance with specifications.
 - 4. Include certification to show compliance with AWI and WDMA requirements specified herein.
- B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for finishing and other pertinent data.
 - 1. Include requirements for veneer matching.
- C. Submit the following
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches for each material and finish. For each wood species and transparent finish,

provide set of three samples showing typical range of color and grain to be expected in the finished work.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated"; latest edition "Premium" grade and WDMA "Extra Heavy Duty" Performance Level.
 - 1. Only manufacturers that are certified and listed by AWI to be QCP qualified are acceptable for this project.
 - 2. Provide letter of licensing for Project indicating that doors comply with requirements of grade specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) in excess of permitted standard noted in Article 2.5 herein, or show telegraphing of core construction in face veneers.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Solid Core Flush Wood Doors: Life of installation.

PART 2 PRODUCTS

2.1 SOLID CORE FLUSH WOOD DOORS

- A. Provide AWI PC-5 Premium Grade hot pressed 5-ply solid core particleboard doors, 1-3/4" thick, conforming to standards specified herein. Subject to meeting standards specified herein, the following manufacturers are acceptable: Marshfield Door Systems, Inc., Algoma Hardwoods Inc., or Eggers Hardwood Products Corp., Graham or approved equal.
 - 1. Core shall consist of a formed flat panel consisting of wood particles bonded together with synthetic resins or other added binder, with an average density of 30 to 32 lbs. per cubic foot. The material shall meet or exceed the requirements of ANSI A208.1, Grade 1-LD-2 covering mat formed particleboard with face screw holding of 124 lbs., modulus of rupture of minimum 700 psi and modulus of elasticity of not less than 148,000 psi.
 - 2. Core shall be capable of satisfying this WDMA TM-7 cycle slam test for 1 million slams for surface mounted hardware. Where the manufacturer's core does not meet this criteria, stiles and rails must measure a minimum of 5-1/2" and must be fabricated of hardwood.
 - a. Surface mounted hardware must be installed with minimum 1-1/4" screw penetrations using threaded to the head screws; coordinate with Section 087100.
- B. Cross Bands: Shall be 1/16" thick hardwood extending full width of door and laid with grain at right angles to face veneers. Cross bands and faces shall be laminated to the core with Type I MF or PVA glue.
- C. Stiles, Rails: Stile and rail shall be a minimum of 1-3/8" solid hardwood or structural composite lumber (after trimming) laminated to the core. Stiles and rails must be securely glued to the core with no voids allowed. Stiles and rails must be capable of screw holding of 550 lbs. per WDMA TM-10.
- D. Vertical door edge must be capable of screw holding of 550 lbs. per WDMA TM-10; horizontal door edge must be capable of screw holding of 400 lbs. per WDMA TM-10.
- E. Doors with transparent finish to have center balanced, slip matched, quarter sliced, Select oak veneer. Veneer to conform to AWI, "AA" grade veneer with 3" wide leaf. Minimum veneer thickness shall be not less than 1/50" after sanding.
 - 1. Veneers shall be continuous or end matched at transoms.
- F. Doors shall have hinge loading capacity of 500 lbs. per WDMA TM-8.
- G. Where glass lites are noted, factory cut openings. Trim openings with solid hardwood moldings of same type of wood as face veneer. Lite openings in 20 minute rated doors shall have manufacturer's 20 minute approved hardwood system.
- H. Doors to be field painted shall have MDO or hardboard face.

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2.2 SHOP FINISH

- A. Transparent Finish: Finish in the shop with clear satin catalyzed polyurethane finish conforming to AWI System "Catalyzed Polyurethane Transparent".
- B. Opaque Finish: For doors to be field painted, shop prime on all surfaces with one coat of alkyd wood primer applied to a dry film thickness of 1.5 mils.

2.3 FABRICATION

- A. Prefit and premachine wood doors at the factory.
- B. Comply with the tolerance requirements specified herein. Machine doors for hardware requiring cutting of doors. Comply with final hardware scheduled and door frame shop drawings, and with hardware templates and other essential information required to ensure proper fit of doors and hardware.
- C. Take accurate field measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with machining in the factory.
- D. Doors shall be factory sized to door opening so that trimming and fitting are not required in the field.
- E. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances unless otherwise indicated.
 - 1. Three degree bevel or bevel to suit frame sizes indicated, with 3/16" prefit in width, +0/-1/32" tolerances. Prefit top of door 1/8" + 1/16"/-0" and undercut as required by floor condition. Undercut shall not exceed 1/8" from bottom of door to top of finished floor; where threshold occurs undercut shall not exceed 1/8" from bottom of door to top of threshold.
- F. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3 unless otherwise noted. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- G. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kinds of doors required.

2.4 SOURCE QUALITY CONTROL

- A. Once installed, maximum allowable warp, bow, cut or twist in doors shall be 1/16" as measured by the 1/16 inch feeler gauge and a straight-edge extending from corner to corner of the door face at stiles, top and bottom rails and along both diagonals.

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PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 Door Hardware.
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

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SECTION 08 51 13

ALUMINUM WINDOWS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the aluminum windows as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Aluminum windows, in-swinging casement and fixed.
 - 2. Miscellaneous insulation at window frames.
 - 3. Anchors, hardware and accessories including trim pieces and panning.

1.3 RELATED SECTIONS

- A. Unit Masonry - Section 04 20 00.
- B. Joint Sealers - Section 07 92 00.
- C. Glass and Glazing - Section 08 80 00.

1.4 PERFORMANCE REQUIREMENTS

- A. Windows shall conform to the "Voluntary Specification for Aluminum Prime Windows & Sliding Glass Doors" as published by ANSI/AAMA 101/I.S.2-97 unless more stringent requirements are specified. Windows shall conform to minimum standards of AW90 for casement and fixed windows.
- B. Performance and Testing: Except as otherwise indicated, comply with air infiltration tests, water resistance tests and applicable load tests specified in ANSI/AAMA 101/I.S.2-97 for AW90 window units.
 - 1. Testing: Where manufacturer's standard window units comply with requirements and have been tested in accordance with specified tests, provide certification by manufacturer to the Architect and Owner showing compliance with such tests; otherwise, perform required tests through an AAMA-accredited testing laboratory or

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agency, and provide certified test results to the Architect and Owner.

2. Test reports shall be not more than four years old.
 3. Sample submitted for tests shall be manufacturer's standard construction and whose overall dimensions shall be at least the lay-out size window and window/door unit required for this Project. Sequence of test shall be optional between manufacturer and the testing laboratory except that in all cases, air infiltration test shall be performed before water resistance test. Sash in sample shall contain the approximate configuration as that of windows to be tested.
 4. To evaluate testing and measure product performance, testing shall be conducted on manufacturer's standard product glazed with type of glazing material specified herein.
- C. A thermal transmittance test and a condensation resistance test shall be conducted according to AAMA 1503-04, "Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections." Standard test conditions as specified in Section 9.1 of the 1503.1-04 shall be used. Windows shall meet the following minimum criteria:
1. Condensation Resistance Test (CRF)
 - a. With window sash and ventilators closed and locked, test unit in accordance with AAMA 1502.7.
 - b. Condensation Resistance Factor (CRF) shall be not less than 50.0 for glass and 55.0 for frame.
 2. Thermal Transmittance Test (Conductive U-Value)
 - a. With window sash and ventilators closed and locked, test unit in accordance with AAMA 1503.0.
 - b. Conductive thermal transmittance (U-value) shall be not more than 0.43 BTU/hr/sf/deg. F.
- D. Provide anchorage of window to building substrate to withstand pressure or suction winds loads per requirements of the Building Code but not less than 30 psf.
- E. Life Cycle Testing: When tested in accordance with AAMA 910-93, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage which would cause the window to be inoperable at the conclusion of testing. Air infiltration and water resistance tests shall not exceed the primary performance requirements specified.
- F. Fabricate and install window to allow for thermal movement of materials when subject to a temperature differential from –30 deg. F. to +180 deg. F. without damage of any finish.

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1.5 QUALITY ASSURANCE

- A. Manufacturers shall have been engaged in the manufacture of aluminum windows of grades specified for not less than 10 years.
- B. Take field measurements of existing openings prior to submitting shop drawings and show same on shop drawings for each opening. Note that the Contract Drawings show general locations and sizes of windows, but the Contractor shall remain responsible for all field measurements, quantities, etc.

1.6 SUBMITTALS

A. Shop Drawings

- 1. Shop drawings shall show in detail and fully indicate the location and the quantities of all the work, the kind, finish, size, section of each unit, overall and detail dimensions, factory and field joint locations, arrangements and details, location and detail of each piece of anchorage, flashings, supporting construction provisions for the work of others.
- 2. Shop drawings shall show all surrounding conditions on elevations and details, including steel, concrete, masonry, lintels, block, and anchorage; all correctly dimensioned.
- 3. Shop drawings of building elevations shall be at scale of $1/8" = 1'-0"$, or larger. Other shop drawings shall be at a scale that is normal to trade, or larger if required by Architect.
- 4. Contract drawings may not be used (reproduced, enlarged, reduced, etc.) by Subcontractor for shop drawings.
- 5. Shop drawings also shall fully demonstrate all requirements respecting the manufacture, finishing, handling, storage, carting sequence and erection of all materials specified herein.
- 6. Show joinery techniques, provision for horizontal and vertical expansion, drainage and weep systems, glass and metal thicknesses and framing member profiles.
- 7. Identify all materials, including metal alloys, glass types, fasteners, and glazing materials. Identify all shop and field sealants by product name and locate on drawings. Glazing details shall be at full size scale.
- 8. Show dimensioned position of glass edge relative to metal rabbet.
- 9. Shop drawings shall show attachments of window assemblies to adjoining construction and location of all work; kind, finish and size of frames, overall and detail dimensions, location and detail of each anchorage; supporting and adjoining construction; provision for the work of other trades; and all other required

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information.

10. Contractor shall verify all measurements of existing window openings in the field before commencing fabrication.

11. Any proposed deviations from work shown on the Contract drawings shall be indicated and so identified on shop drawings for Architect's review.

B. Samples

1. Submit 12" long sample of extrusion with specified finish.

2. Full size corner section of all types of aluminum frame, showing construction, glass and finishing - 12" x 12".

3. All fasteners, straps, hardware, locks and keys, sealant, etc.

C. Submit certified test results as required herein.

D. Guarantees as noted in 1.8.

E. Window manufacturer and Contractor for work of this section must each submit references of prior projects similar in size, scope and window type.

1.7 DELIVERY, STORAGE AND HANDLING

A. Materials shall be packed, loaded, shipped, unloaded, stored and protected in a manner which will avoid abuse, damage and defacement in accordance with the recommendations contained in the AAMA Aluminum Curtain Wall Manual #10 entitled "Care and Handling of Architectural Aluminum from Shop to Site."

B. Remove all paper type wrappings and interleavings that are wet or which could become wet when unloading materials.

C. Store inside structure in space designated by Owner.

D. Stack vertically or on edge so that water cannot accumulate on or within materials using wood or plastic shims between components to provide water drainage and air circulation.

E. Cover materials with tarpaulins or plastic hung on frames to provide air circulation and prevent contaminants from contacting aluminum.

F. Keep water away from stored assemblies.

G. The Contractor shall be responsible for taking the steps necessary to protect the materials from careless handling of tools, weld splatter, acids, roofing tar, solvents, abrasive cleaners, and other items that could damage window components and finish.

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1.8 MANUFACTURER'S REPRESENTATIVE

- A. Contractor shall require representative of manufacturer of the windows to provide field instructions and supervision of the installation of the windows.
- B. Contractor shall require the manufacturer's representative to make sure that the subcontractor's workmen are fully instructed and trained in the handling and application of all the materials, and shall see that all the materials are correctly installed.
- C. Upon completion of the installation, the Contractor shall submit to the Architect in written form certification that the representative of the manufacturer of the windows has supervised the work of this Section and that all windows are correctly installed.

1.9 GUARANTEE

- A. Aluminum Windows and Related Materials: Ten (10) year guarantee on materials and workmanship, including finish on aluminum and on glass and glazing.

PART 2 PRODUCTS

2.1 WINDOWS

- A. Aluminum windows shall be "8225TL Isolock" as manufactured by Kawneer, or equivalent product of Graham, Wausau, or approved equal.

2.2 FIXED AND CASEMENT WINDOWS

A. Aluminum Windows and Components

- 1. Extruded aluminum prime billet 6063-T5, aluminum sheet 3003 H14.
- 2. Minimum principal window member wall thickness 0.090".
- 3. Minimum frame and vent depth, front to back, shall be 2-1/4". Vent to be flush with frame.
- 4. Maximum exposed metal sightlines of main frame members shall be 2" at all members except 3" at horizontal intermediate between fixed and operable areas.
- 5. Glass plane shall be recessed 1" from exterior plane of window members. Framing members shall possess a sloped profile duplicating an existing exterior putty glazed steel window profile.
- 6. There shall be no change in exterior sightlines between fixed and operable units including spandrel areas.
- 7. Vent sections must be tubes.

B. Hardware - General

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1. All steel components 300 Series stainless steel (SS) (except roto-operator arms) i.e. - keepers, fasteners, hold open arms, tracks, etc.
 2. All aluminum components 6063-T5 (T6) or 6105-T6.
 3. Locking handles and cases, white bronze.
 4. Hardware members bridging frame or vent thermal barrier to be nylon or suitable low conductivity, non-metallic material.
- C. Thermal-Break, Frame and Vent: Factory poured in place polyurethane into prefinished cavity in manufacturer's plant providing minimum 3/8" separation.
- D. Weatherstripping: Extruded sponge neoprene meeting ASTM C 509.
- E. Glass and Glazing: Shop glaze, see section 088000 for material description.

2.3 FABRICATION

- A. General
1. Finish, fabricate and shop assemble frame and sash members into complete windows under responsibility of one manufacturer.
 2. No bolts, screws or fastenings to bridge thermal barriers or impair independent frame movement.
- B. Casement Ventilator: Miter all corners and mechanically stake over solid aluminum, corner block minimum 1/4" thick, set and sealed in epoxy leaving hairline joinery, then seal weathertight. Joinery methods must not discolor finish or be unsightly.
- C. Main Frame Members: Miter all corners and continuously weld along unexposed surfaces so as not to affect the structural or thermal integrity of the thermal barrier, then seal weathertight.
- D. Weatherstripping
1. Two rows (both inner and outer overlap contacts) of extruded neoprene meeting ASTM C 509 in extruded races about perimeter of operating sash.
 2. Securely stake and join at corners.
- E. Glass Drainage: Provision shall be made to insure that water will not accumulate and remain in contact with the perimeter areas of sealed insulating glass.
- F. Hardware
1. Hinges

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- a. Each operating sash shall be provided with a minimum of two extruded aluminum, three knuckle hinges with stainless steel pins. Windows over 4'-4" in height shall be provided with an intermediate hinge.
- b. The hinge shall be attached to both the frame and sash with concealed fasteners. The hinge shall be furnished to match the window.

2. Locks

- a. Each operating sash shall be provided with a minimum of one die cast locking handle up to a ventilator height of 4'-0" and two locking handles on vents over 4'-0" high.
- b. All locking hardware shall be provided with a stainless steel strike backed up with an extruded aluminum leg a minimum of 0.125" in thickness. Locking directly against aluminum, will not be accepted.

3. Riser Blocks: Each operating vent shall be equipped with a nylon riser block at the sill.

G. Insect Screens: Frames shall be of tubular aluminum extrusions of manufacturer's standard alloy. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame. Mesh shall be 18-by-16 screen cloth of 0.011 inch diameter coated aluminum wire. Colors shall be as selected by the Architect from manufacturer's full range.

H. Rescue Labels: Windows designated on drawings as "Rescue" or "Egress" windows shall meet all applicable codes and shall include a conforming label.

2.4 FINISH OF ALUMINUM

A. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: Cleaned with inhibited chemicals; Chemical Finish: Acid-chromate-fluoride-phosphate conversion coating; Organic Coating: As specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermoscured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605-02.
2. Custom color and gloss as selected by the Architect.

PART 3 EXECUTION

3.1 INSPECTION AND REMOVALS

24 June 2022

Construction Documents – SED Addendum 2

SED NO: 48-05-03-04-0-001-013

SED NO: 48-05-03-04-0-007-002

SED NO: 48-05-03-04-0-010-006

SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District

COVID-Related Capital Projects

Elementary School Outdoor Classrooms

Elementary School Modular Building Alterations

High School Exterior Courtyard Alterations

Transportation Building Alterations

- A. Examine surfaces and conditions where aluminum windows are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.
- B. Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance to the attention of the Architect. Obtain decision regarding corrective measures before the start of installation.

3.2 INSTALLATION

- A. Use only skilled tradesman with work done in accordance with approved Shop Drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane and erect windows and materials square and true adequately anchored to maintain positions permanently when subjected to normal thermal and building movement and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weathertight installation at all metal-to-metal joints and intersections of frames and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
- E. Aluminum shall be insulated from direct contact with steel, masonry, concrete, or non-compatible materials by bituminous paint, zinc chromate primer, or other suitable insulation material.
- F. Blanket insulation shall be installed behind aluminum covers, panning and trim to insure thermally insulated seal.

3.3 ADJUSTING AND CLEANING

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, etc.
- B. Glass that is broken, damaged, cracked, or permanently stained shall be replaced.
- C. Final cleaning of finish shall be in accordance with AAMA 610.1.

END OF SECTION

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:

- 1. Mechanical (and electrified) door hardware for the following:
 - a. Swinging doors
 - b. Sliding doors
 - c. Gates
- 2. Field verification, preparation and modification of existing doors and frames to receive new door hardware.
- 3. Lead-lining door hardware items required for radiation protection at door openings.

- B. Exclusions: Hardware for the following is not provided under the scope of this section, unless specifically listed in the hardware sets:

- 1. Windows
- 2. Cabinets (casework), including locks in cabinets
- 3. Signage
- 4. Toilet accessories
- 5. Overhead doors

- C. Related Sections:

- 1. Joint Sealants – Section 079200

1.3 REFERENCES

- A. Applicable state and local building codes and standards.

B. Fire/Life Safety

1. NFPA - National Fire Protection Association

- a. NFPA 70 – National Electric Code
- b. NFPA 80 - Standard for Fire Doors and Fire Windows
- c. NFPA 101 - Life Safety Code
- d. NFPA 105 - Smoke and Draft Control Door Assemblies

2. State and/or City Fire Safety Code

C. UL - Underwriters Laboratories

- 1. UL 10B - Fire Test of Door Assemblies
- 2. UL 10C - Positive Pressure Test of Fire Door Assemblies
- 3. UL 1784 - Air Leakage Tests of Door Assemblies
- 4. UL 305 - Panic Hardware

D. Accessibility

- 1. ADA - Americans with Disabilities Act.
- 2. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

E. DHI - Door and Hardware Institute

- 1. Sequence and Format for the Hardware Schedule
- 2. Recommended Locations for Builders Hardware

F. ANSI - American National Standards Institute

- 1. ANSI/BHMA A156.1 - A156.29, and ANSI A156.31 - Standards for Hardware and Specialties

1.4 SUBMITTALS

A. General:

- 1. Submit the following in accordance with Conditions of Contract and Division 01 requirements.
- 2. Advise Architect within the submittal package of incompatibility or issues which may detrimentally affect the work of this section.
- 3. Prior To Forwarding Submittal: Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of the hardware schedule, submit details of electrified door hardware, indicating the following:
 - a. Wiring Diagrams: For power, signal, and control wiring and including the following:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
3. Samples for Verification: If requested by the Architect, submit production sample or sample installations as requested of each type of exposed hardware unit in the finish indicated, and tagged with a full description for coordination with the schedule.
 - a. Samples will be returned to the supplier in like-new condition. Units that are acceptable to the Architect may, after final check of operations, be incorporated into the Work, within limitations of key coordination requirements.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by the Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, Include the following information:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet; list locking device and function for each opening.
 - c. Type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for the local manufacturer's representative for each product.

- k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and/or access control components). Operational description should include how the door will operate on egress, ingress, and fire/smoke alarm connection.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:

- a. After a keying meeting between representatives of the Owner, Architect, hardware supplier—provide a keying schedule listing the levels of keying as well as an explanation of the key system's function, the key symbols used and the door numbers controlled.
 - b. Utilize ANSI A156.28 “Recommended Practices for Keying Systems” as a guideline for nomenclature, definitions, and approach for selecting the optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner’s final keying instructions for locks.
6. Templates: After final approval of the hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for the installation of door hardware.

C. Informational Submittals:

- 1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
- 2. Product Certificates for electrified door hardware, signed by the manufacturer:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Certificates of Compliance:

- a. Upon request of Architect or Authority Having Jurisdiction certificates of compliance for fire-rated hardware and installation instructions shall be made available.
4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
5. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include the following:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - e. Copy of final approved hardware schedule, edited to reflect conditions as-installed.
 - f. Copy of final keying schedule.
 - g. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
 - h. Copy of warranties including appropriate reference numbers for manufacturers to identify the project.

1.5 QUALITY ASSURANCE

- A. Product Substitutions: For the purpose of performing the work of this section, comply with product requirements stated in Division 01 and as specified herein.
- B. Supplier Qualifications and Responsibilities: A recognized architectural hardware supplier that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides a certified Architectural Hardware Consultant (AHC) available to the Owner, Architect, and Contractor, at reasonable times during the course of the Work for consultation.
 1. Warehousing Facilities: In Project's vicinity.
 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.

3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
4. Coordination Responsibility: Coordinate installation of the electronic security hardware with the Architect and electrical engineers and provide installation and technical data to the Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- C. Installer Qualifications: Qualified tradesmen, skilled in the application of commercial grade hardware that has a record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who can meet the following qualification requirements:
 1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 2. Can provide installation and technical data to the Architect and other related subcontractors.
 3. Can inspect and verify components are in working order upon completion of installation.
 4. Capable of producing wiring diagrams.
 5. Capable of coordinating installation of the electrified hardware with the Architect and electrical engineers.
- E. Single Source Responsibility: Obtain each type of door hardware from a single manufacturer.
 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
 2. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to the authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

- G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.
- H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- I. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- J. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
 - 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high [and] 3/4 inch (19 mm) high for exterior sliding doors].
 - 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- K. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.
 - 1. Attendees: Owner, Contractor, Architect, Installer, Supplier’s Architectural Hardware Consultant.
 - 2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.

- d. Requirements for access control.
- e. Address for delivery of keys.

L. Pre-installation Conference: Conduct conference at Project site.

- 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 2. Inspect and discuss preparatory work performed by other trades.
- 3. Review required testing, inspecting, and certifying procedures.

M. Coordination Conferences:

- 1. Installation Coordination Conference: Prior to hardware installation, schedule and hold a meeting for the purpose of reviewing any questions or concerns related to the proper installation and adjustment of door hardware.
 - a. Attendees: doors hardware supplier, door hardware installer, Contractor.
 - b. After the meeting, provide letter of compliance to the Architect, indicating when the meeting was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 - 1. Each article of hardware shall be individually packaged in manufacturer's original packaging.
- C. Project Conditions:
 - 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 - 2. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:
 - 1. Promptly replace products damaged during shipping with exactly the same products.
 - 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during the course of the Work.

- 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- F. Deliver keys (and permanent cores) to Owner by registered mail or overnight package service.

1.7 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.
- F. Direct shipments not permitted, unless approved by the Contractor.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Closers:

24 June 2022
Construction Documents – SED Addendum 2
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

Putnam Valley Central School District
COVID-Related Capital Projects
Elementary School Outdoor Classrooms
Elementary School Modular Building Alterations
High School Exterior Courtyard Alterations
Transportation Building Alterations

- 1) Mechanical: 10 years.
 - 2) Electrified: 2 years.
 - b. Exit Devices:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - c. Locksets:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - d. Continuous Hinges: Lifetime warranty
 - e. Key Blanks: Lifetime
2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

A. Maintenance Tools:

1. Furnish One (1) complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approval of manufacturers other than those listed shall be in accordance with QUALITY ASSURANCE article, herein.
- B. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- C. Where the hardware specified is not adaptable to the finished shape or size of the members requiring hardware, furnish suitable types having the same operation and quality as the type specified, subject to the Architect's approval.

2.2 EXISTING MATERIALS

- A. Where existing door hardware is indicated to be removed and reinstalled:
 1. Carefully remove door hardware and components.

2. Clean, protect and store existing door hardware in accordance with storage and handling requirements specified herein.
3. Reinstall in accordance with installation requirements for new door hardware.

2.3 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent that no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Hardware shall be installed with the fasteners provided by the hardware manufacturer.

B. Modification and Preparation of Existing Doors: Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.

1. When possible, use materials which match materials of adjacent modified areas.
2. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
2. Provide hinges with electrified option where specified. Provide with sufficient number and gage of concealed wires to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to the electrified locking component.
3. Provide mortar guard for each electrified hinge specified, unless specified in hollow metal frame specification.
4. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches or less in height. Provide one additional bearing hinge for each 30 inches of additional door height.

2.4 CONTINUOUS HINGES

A. Aluminum Continuous Hinges

1. Manufacturers:

- a. Scheduled Manufacturer: Pemko
- b. Approved Equals: McKinney, Markar

2. Requirements:

- a. Provide aluminum geared continuous hinges conforming to ANSI A156.25, Grade 2.
- b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum, with .25 inch diameter Teflon coated stainless steel hinge pin.
- c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
- d. Hinges shall be capable of supporting door weights up to 450 pounds, and shall be successfully tested for 1,500,000 cycles.
- e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by a testing agency acceptable to the authority having jurisdiction.
- f. Provide aluminum geared continuous hinges with electrified option where specified. Provide with sufficient number and gage of concealed wires to accommodate electric function of specified hardware.
- g. Install hinges with fasteners supplied by manufacturer. Hole pattern shall be symmetrically patterned.

2.5 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturer:

- 1. Scheduled Manufacturer: Sargent 10 Line
- 2. Approved Equals: Schlage ND Series, Falcon T Series, Yale 5400 Series.

B. Requirements:

- 1. Provide cylindrical locks conforming to ANSI A156.2 Series 4000, Grade 1. Cylinders: Refer to "KEYING" article, herein.
- 2. Provide locks with a standard 2-3/4 inches backset, unless noted otherwise, with a 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
- 3. Provide locksets with a separate anti-rotation throughbolts, and shall have no exposed screws. Levers shall operate independently, and shall have two external return spring cassettes mounted under roses to prevent lever sag.
- 4. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.

5. Provide electrical options as scheduled.
6. Lever trim shall be solid cast levers without plastic inserts, and wrought roses on both sides. Locksets shall be thru-bolted to assure proper alignment.
 - A. Lever design shall be as specified within the sets.

2.6 EXIT DEVICES

A. Manufacturers:

1. Scheduled Manufacturer: Sargent 80 Series
2. Approved Equals: Yale 6000 Series, Von Duprin 99/33 series, Precision Apex Series, Falcon 24/25 Series.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit and/or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to the standard architectural finishes to match the balance of the door hardware.
3. Touchpad shall extend a minimum of one half of the door width. Touch-pad finish shall be compatible to exit device finish. Compression springs will be used in devices, latches, and outside trims or controls, tension springs also acceptable.
4. Exit devices to incorporate a deadlatching feature for security and/or for future addition of alarm kits and/or other electrical requirements.
5. Provide exit devices with manufacturer’s approved strikes.
6. Provide exit devices cut to door width and height. Locate exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect.
7. Mechanism case shall sit flush on the face of all flush doors, or spacers shall be furnished to fill gaps behind devices. Where glass trim or molding projects off the face of the door, provide glass bead kits.
8. Non-fire-rated exit devices shall have cylinder [hex key] dogging.
9. Removable mullions shall be a 2 inches x 3 inches steel tube. Where scheduled, mullion shall be of a type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
10. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to a 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - a. Lever style will match the lever style of the locksets.
 - b. Lever trim on doors serving rooms considered by the authority having jurisdiction to be hazardous shall have a tactile warning.

11. Exit devices for fire rated openings shall be UL labeled fire exit hardware.
12. Field drill weep holes per manufacturer's recommendation for exit devices used in full exterior application, highly corrosive areas, and where noted in the hardware sets.
13. Provide electrical options as scheduled.

2.1 FINAL CYLINDERS AND KEYING

- A. Coordinate a meeting with the owner to determine the key requirements for the building. Key system to be factory master and tie into existing key system. Cores and cylinder housings to be small format interchangeable.

1. Ashcraft Locksmith to match building standard.

- B. Final core to have the following;

1. Core to have concealed key control stampings
2. Final core to be installed by Supplier accompanied by the owner's representative.
3. Return all construction cores to the hardware supplier.
4. Final biting list to be delivered to the owner no additional cost to the owner.

- C. Keys shall have the following;

1. Material: Nickel silver; minimum thickness of .092-inch (2.3mm)
2. Keys to be stamped with visual key control.
3. Key bow to have stamped "DO NOT DUPLICATE".
4. Quantity: Furnish in the following quantities.
 - a. Change (Day) Keys: 3 per cylinder/core.
 - b. Final Control Keys: 3.
 - c. Master Keys: 6.
 - d. Const Master Keys: 10
 - e. Construction Control Keys: 5

2.2 DOOR CLOSERS

- A. Manufacturers:

1. Scheduled Manufacturer: Sargent 281 series
2. Approved Equals: LCN 4010/4110 series, Corbin DC8000 series.

- B. Requirements:

1. Provide door closers certified to ANSI/BHMA A156.4 Grade 1 requirements by a BHMA certified independent testing laboratory. Surface mounted mechanical closers shall be certified to exceed ten million (10,000,000) full load cycles by a

- recognized independent testing laboratory. Closers shall be ISO 9000 certified. Units shall be stamped with date of manufacture code.
2. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder, and shall utilize full complement bearings at shaft. Cylinder body shall be 1-1/2 inch diameter, and double heat-treated pinion journal shall be 11/16 inch diameter.
 3. Provide hydraulic fluid requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F. Fluid shall be fireproof and shall pass the requirements of the UL10C "positive pressure" fire test.
 4. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force as required by accessibility codes and standards. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
 5. Provide closers with a solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within a 6-inch top rail without the use of a mounting plate so that closer shall not be visible through vision panel from pull side.
 6. Closers shall not incorporate Pressure Relief Valve (PRV) technology.
 7. Closer cylinders, arms, adapter plates, and metal covers shall have a powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or shall have special rust inhibitor (SRI).
 8. 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.
 9. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

2.3 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Sargent
2. Approved Equals: Rixson, ABH, Glynn-Johnson

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or overhead stop/holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or overhead stop/holder as specified for double acting doors.

3. Provide heavy or medium duty and concealed or surface mounted overhead stop or overhead stop/holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking a wall, open against equipment, casework, sidelights, and/or where conditions do not allow a wall stop or a floor stop presents a tripping hazard.
4. Where overhead holders are specified provide friction type at doors without a closer and positive type at doors with a closer.

2.4 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Rockwood
2. Approved Equals: Ives, Trimco, Burns

Provide door stops for all doors in accordance with the following requirements:

3. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
4. Where wall stops cannot be used, provide dome type floor stops of the proper height.
5. At any opening where a wall or floor stop cannot be used, a medium duty surface mounted overhead stop shall be used.

2.5 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Pemko
2. Approved Equals: Zero, Reese, NGP

B. Requirements:

1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items as closely as possible. Size of thresholds shall be as follows:
 - a. Saddle Thresholds – 1/2 inch high x jamb width x door width
 - b. Bumper Seal Thresholds – 1/2 inch high x 5 inches wide x door width
2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

3. Perimeter seals shall be installed uninterrupted three sides of opening. Where surface mounted perimeter seals are specified, furnish mounting brackets for the proper installation of surface closers and strikes.

2.6 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Rockwood
2. Approved Equals: Ives, Trimco, Burns.

B. Requirements:

1. Provide "Push-in" type silencers for each hollow metal or wood frame. Provide three for each single frame and two for each pair frame. Omit where gasketing is specified or required by code.

2.7 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: LCN.
2. Approved Equals: Rixson, ABH

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with a minimum of 25 pounds of holding force. Projection of holder and armature must be coordinated with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Where magnetic holders are used on fire-rated doors, they must be wired into the fire control panel for fail-safe operation.

2.8 FINISHES

- ### A. Finish of all hardware shall be as specified within the hardware sets to match existing building hardware.

2.9 WIRELESS LOCKS

A. Requirements:

1. Provide IN120 Wireless Lock and RLI-AS Remote Lock Integration at all secure access doors. Coordinate with the District for integration with existing building access system requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with the existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Where on-site modification of doors and frames is required, prepare hardware locations in accordance with the following:
 - 1. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
 - 2. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
 - 3. Where doors are in rated assemblies, comply with NFPA 80 for restrictions on on-site door hardware preparation.
 - 4. Where on-site modification of existing doors and frames is required:
 - a. Remove existing hardware being replaced, tag, and store according to contract documents.
 - b. Field modify and prepare existing door and/or frame for new hardware being installed.
 - c. When modifications are exposed to view, use concealed fasteners, when possible.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations, using only the fasteners provided by the manufacturer.
- C. Do not install surface mounted items until finishes have been completed on the substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Operating parts shall move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- H. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater than 90 inches (2286 mm).
- I. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as indicated in keying section.
 - 2. Coordinate with owner for direction of the installation of permanent.
- J. Lead Protection: Lead wrap hardware penetrating lead-lined doors. Levers and roses to be lead lined. Apply kick and armor plates on lead-lined doors with adhesive as recommended by manufacturer.
- K. Wire (including low voltage): Coordinate with the following work, provided under the scope of Division 26, ELECTRICAL.

1. Conduit, junction boxes and wire pulls.
 2. Connections to and from power supplies to electrified hardware.
 3. Connections to fire/smoke alarm system and smoke evacuation system.
 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 5. Testing and labeling wires with the Architect's opening number.
- L. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
1. Configuration: Provide [one power supply for each door opening][least number of power supplies required to adequately serve doors] with electrified door hardware.
- N. Thresholds: Set thresholds scheduled herein, in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- O. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present a tripping hazard.
- P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- R. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three [six] <Insert number> months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Provide training for the Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.8 DOOR HARDWARE SCHEDULE

- A. Provide hardware for each door to comply with requirements of this section and the below-listed scheduled sets.
- B. It is intended that the following schedule includes complete items of door hardware necessary to complete the work. If a discrepancy is found in the scheduled hardware sets, such as a missing item, improper hardware for a frame, door or fire codes, provisions of the above-specifications shall govern.

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- C. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets: See spec section 08 71 01

End of Section

SECTION 08 71 01

DOOR HARDWARE SETS

HARDWARE SETS

CL: Classroom

- Classroom function lockset w/keyed interior cylinder (Intruder function) and Indicator
- Overhead closer on active leafs
- Paired: Inactive leaf w/integral astragal and top & bottom flush bolts

EA: Exterior, Aluminum

- Single: Electrified rim cylinder exit device w/keyed cylinder dogging
- Paired: Keyed alum removable mullion with electrified rim cylinder exit device w/keyed cylinder dogging
- Overhead closers
- Auxiliary Stop
- Architectural Pull on each leaf
- Aluminum saddle
- Weather-stripping & door sweeps
- Card / FOB reader by others

TS: Toilet, Single-User

- Dormitory function lockset w/occupancy indicator
- Coat hook on back – maximum height of 48" AFF
- Overhead closer

TYPICAL HARDWARE NOTES:

1. Do not order any door hardware until keying and keying system, has been selected and coordinated with the District.
2. Provide "Fire Bolt" hardware (w/suitable UL listing & fire rating) for doors within fire walls & smoke barriers. (no-dogging permitted)
3. Hardware within fire walls shall be rated for the fire rating of that wall.
4. Hollow metal frames within fire walls shall be rated for the fire rating of that wall.
5. All glazing added in the new or existing gyms shall be safety glazing in addition to fire ratings denoted.
6. All hardware shall be stainless steel US32D.
7. Provide continuous hinges at all exterior doors and as noted elsewhere. All other doors to receive 1½ pr. H.D. Butt hinges per leaf unless noted otherwise. (doors over 7' shall receive 2pr. of hinges per leaf)
8. Provide integral hold-open feature on overhead closers at main entry doors & associated vestibule doors. Also as noted in door schedule & where adjacent wall(s) cannot provide 90° wall type magnetic hold open.
9. Provide kick plate on push side of all doors except aluminum doors. Provide mop plates on pull side of all doors except at carpeted areas.
10. Provide 3 silencers on all strike jambs.
11. Provide appropriate wall, or overhead stop for each door location. Floor stops are not to be used unless specifically approved by the architect, on a case by case basis.
12. Provide panic device glass bead shim kit where required
13. See plans for hardware swing extent and provide hardware accordingly.
14. Size hinges and closers to match door size and weight.
15. Provide 'safety' fire rated glass in rated doors/frames. Provide tempered glass for all other doors/frames requiring safety glazing. At minimum, safety glazing is required for all locations where glazing is 18" or less above finished floor and for all glazing that is in a corridor that is 48" or less above finished floor. See door schedule for ratings, safety & heat transfer info.
16. Smoke /Fire doors are to have Smoke Fire Gaskets.
17. At smoke & fire doors with magnetic hold-open feature that do not have a wall adjacent for mounting hold-open, provide integrated type within frame. G.C. to coordinate this with E.C. for inclusion of wiring.
18. Dust proof strike w/ all vertical rod exit devices
19. See door schedule for specific exceptions to hardware sets
20. See door schedule for door saddle requirements & details.
21. Coordinate door undercuts with saddle requirements.
22. For Narrow Stile Doors (NS1) – prior to ordering doors or hardware, confirm hardware will function properly.
23. At electrified doors, coordinate all door & frame wiring harnesses, contacts & power supply required for proper door operation. Components provided by division 28 13 00.

*** END OF SECTION ***

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SECTION 08 80 00

GLASS AND GLAZING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the glass and glazing as shown on the drawings and/or specified herein, including, but not limited to, glazing of the following:
 - 1. Windows.
 - 2. Doors.
 - 3. Curtain walls.
 - 4. Entrances.
 - 5. Storefront framing.
 - 6. Interior borrowed lites.
 - 7. Interior frameless mirrors.
 - 8. Security glazing.

1.3 RELATED SECTIONS

- A. Steel Doors and Frames - Section 08 11 13.
- B. Aluminum Windows - Section 08 51 13.

1.4 REFERENCES

- A. Comply with the recommendations of the following references unless more stringent requirements are indicated herein.
 - 1. FGMA Publications: FGMA Glazing Manual.
 - 2. AAMA Publications: AAMA TIR-A7 Sloped Glazing Guidelines and Glass Design

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for Sloped Glazing.

3. LSGA Publications: LSGA Design Guide.
4. SIGMA Publications: TM-3000 Vertical Glazing Guidelines and TB-3001 Sloped Glazing Guidelines.
5. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201, Safety Standards for Architectural Glazing, Sealed Insulating Glass Manufacturing Association.
6. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
7. Fire-Resistive Glazing Products for Window Assemblies: Products identical to those tested per ASTM E 163, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
8. ASTM C 920, Standard Specification for Elastomeric Joint Sealants.
9. Insulating Glass Criteria: IGCC International Glass Certification Council.

1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated on drawings and/or specified herein are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: 30 psf or greater if required by Code.
 2. Probability of Breakage for Vertical Glazing:
 - a. 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - b. 1 lite per 1000 for lites installed 15 degrees from the vertical and under wind action.

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- c. Load Duration: 60 seconds or less.
- 3. Maximum Lateral Deflection: For glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/100 times the short side length or 1/2", whichever is less.
- 4. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - a. Temperature Change (Range): 120 deg. F ambient; 180 deg F, material surfaces.
- 5. Thermal Solar Performance: See Article 2.2 herein.
- C. Glass units shall be annealed, heat strengthened, fully tempered or laminated where required to meet wind load and safety glazing requirements, as shown, specified, or recommended by the glass fabricator, and as required by the prevailing Building Code.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements, including performance requirements.
- B. Submit compatibility and adhesion test reports from sealant manufacturer indicating materials were tested for compatibility and adhesion with glazing sealant, as well as other glazing materials including insulation units.
- C. Initial Selection Samples: Submit samples of each glass and glazing material showing complete range of colors, textures, and finishes available for each material used.
 - 1. Submit complete range of samples of standard colors and patterns for ceramic frits at insulating glass.
 - 2. Submit complete range of samples of sandblasted glass showing variations of grits and opacity achieved.
- D. Verification Samples: Submit representative samples of each glass and glazing material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide glass samples having minimum size of 144 sq. in. and 6 in. long samples of sealants and glazing materials; all samples shall bear the name of the manufacturer, brand name, thickness, and quality.

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- E. Calculations: Provide wind load charts, calculations, thermal stress analysis, and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied. Document shall be signed and sealed by a Professional Engineer licensed in the State of New York.
- F. Test Reports: Provide certified reports for specified tests.
- G. Warranties: Provide written warranties as specified herein.

1.7 QUALITY ASSURANCE

- A. Source: For each glass and glazing type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.
- B. Installer: A firm with a minimum of five years' experience in type of work required by this Section and which is acceptable to manufacturers of primary materials; and with a successful record of in-service installations similar in size and scope to this Project.
- C. Glass Thickness: Glass thicknesses shown on drawings and/or specified herein are minimum thicknesses. Determine and provide size and thickness of glass products that are certified to meet or exceed performance requirements specified in this Section.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated.
 - 1. GANA Publications: GANA's "Glazing Manual" and "Laminated Glass Design Guide."
 - 2. IGMA Publications: IGMA TM-3000, "Vertical Glazing Guidelines for Sealed Insulating Glass Units."
- E. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.
- F. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- G. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
 - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification

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2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

H. Insulating Glass Certification Program: Permanently marked on spacers with appropriate certification label of the following testing and inspecting agency:

1. Insulating Glass Certification Council.
2. Associated Laboratories, Inc.
3. Insulating Glass Manufacturers Alliance.

I. Manufacturer shall be ISO 9001-2000 Certified.

1.8 TESTS

A. Preconstruction Sealant Test: Submit samples of materials to be used to glazing sealant manufacturer to determine sealant compatibility. Include samples of glass, gaskets, glazing materials, framing members, and other components and accessories of glazing work. Test in accordance with ASTM C 794 to verify what type of primers (if any) are required to ensure sealant adhesion to substrates.

1. Submit minimum of nine pieces of each type and finish of framing member, and nine pieces of each type, class, kind, condition, and form of glass, including monolithic, laminated, and insulating glass for adhesion tests.
2. Provide manufacturer's written report and recommendations regarding proper installation.

1.9 PROJECT CONDITIONS

- A. Weather: Perform work of this Section only when existing or forecasted weather conditions are within limits established by manufacturers of materials and products used.
- B. Temperature Limits: Install sealants only when temperatures are within limits recommended by sealant manufacturer, except, never install sealants when temperatures are below 40 deg. F.

1.10 DELIVERY, STORAGE AND HANDLING

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- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations and GANA Manual.
 - 1. Protect materials from moisture, sunlight, excess heat, sparks and flame.
 - 2. Sequence deliveries to avoid delays but minimize on-site storage.

1.11 WARRANTIES

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.
- B. Manufacturer's Special Project Warranty on Coated Glass Products: Provide written warranty signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, within specified warranty period indicated below, replacements for those coated glass units which develop manufacturing defects. Manufacturing defects are defined as peeling, cracking or deterioration in metallic coating due to normal conditions and not due to handling or installation or cleaning practices contrary to glass manufacturer's published instructions.
 - 1. Warranty Period: Manufacturer's standard but not less than five (5) years after date of substantial completion.
- C. Manufacturer's Special Project Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure or hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.
 - 1. Warranty Period: Manufacturer's standard but not less than ten (10) years after date of substantial completion.
- D. Manufacturer's Special Project Warranty on Laminated Glass: Manufacturer's standard form, made out to Owner and signed by laminated glass manufacturer agreeing to replace laminated glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty period five (5) years from date of Substantial Completion.

PART 2 PRODUCTS

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2.1 ACCEPTABLE MANUFACTURERS/FABRICATORS

- A. All glass and glazing used at the exterior of the Project shall be manufactured by the same manufacturer. The same manufacturer and the same furnace shall be used for all tempered and heat strengthened glass used throughout the project. Acceptable manufacturers include, but are not limited to, the following:
 - 1. Vitro Architectural Glass.
 - 2. Guardian Industries.
 - 3. Pilkington.
 - 4. AFG.
 - 5. JE Berkowitz, LP.
 - 6. Viracon.

2.2 GLASS MATERIALS AND PRODUCTS

- A. Ultra-Clear (Low-Iron) Glass: Class I (clear); with a minimum 91 percent visible light transmission and a minimum solar heat gain coefficient of 0.87.
 - 1. Low Iron Tempered Glass: Provide "Starphire" by Vitro Architectural Glass, or approved equal, tempered in accordance ASTM C 1048, thicknesses as indicated.
- B. Clear Float Glass: ASTM C 1036, Type I (transparent, flat), Class 1 (clear), Quality q3, minimum 1/4" thick.
- C. Clear Tempered Glass: ASTM C 1048, Condition A (uncoated), Type I (transparent, flat), Class 1 (clear), Quality q3, Kind FT, minimum 1/4" thick. Tempered glass must be certified by SGCC to meet applicable standards.
 - 1. Performance Requirements for Tempered Glass
 - a. Length and Width: For 2.9 mm to 6.0 mm; +/-1.6 mm.
 - b. Diagonal: +/- 3.0 mm.
 - c. Edgework: Belt seaming or diamond wheels. 1.5 mm seam of upper and lower glass edges. No sharp edges.
 - d. Corners: No more than 3.0 mm from square.
 - e. Float Glass Defects: Must meet the requirements of ASTM C 1036. The most common defects are scratches, stones gaseous bubbles and edge chips. Tables in the glass standards have limits for size/quantity of defects.
 - f. Tempered glass shall have a minimum surface compression of 10,000 psi.
 - g. Tempered glass to be heat-treated by horizontal (roller hearth) process with

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inherent roller-wave distortion parallel to the bottom edge of the glass when installed.

h. Flatness Tolerances

- 1). Roller-Wave or Ripple: The deviation from flatness at any peak shall be targeted not exceed 0.003" as measured per peak to valley for 1/4" (6mm) thick glass.
- 2). Bow and Warp: The bow and warp tolerances shall not exceed 1/32" per linear foot.
- 3). Fully tempered glass shall be heat soaked to EN 14179-1:2005-European Heat Soaking Standard.

D. Laminated Safety Glass: Provide two glass panes of equal thickness, laminated together with a polyvinyl butyl interlayer, conforming to ASTM C 1172 and as follows:

1. Interlayer Color: Clear.
2. Interlayer Material: Provide Eastman Chemical "Saflex" or "Vanceva," or DuPont "Butacite," 0.030" thick at vertical applications, and 0.060" thick at sloped or horizontal applications.
3. Minimum thickness of 1/4".

E. Patterned Glass: Provide ceramic frit patterned glass in custom colors and patterns as selected by the Architect, minimum thickness of 1/4". Ceramic frit glass shall meet requirements specified herein for ceramic frit spandrel glass.

F. Ceramic Frit Spandrel Glass:

1. Heat-treated glass with ceramic coating complying with ASTM C 1048, Condition B (spandrel glass, one surface ceramic-coated) Type 1 (Transparent, Flat), Quality Q3 (Glazing Select), with other requirements as specified.
2. GANA/GTA 66-9-20, Specification for Heat-Strengthened or Fully Tempered Ceramic Enamel Spandrel Glass Used for Building Window/Curtain Walls.
3. Custom color selected by the Architect.

G. Insulating Glass: Insulating glass unit shall consist of 1/4" clear exterior lite of float (or tempered, where required) glass with Low E coating on No. 2 face, 1/2" interspace and 1/4" clear interior lite of float (or tempered, where required) glass. Provide factory assembled units of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space, complying with ASTM E 2190, and as follows:

1. Sealing System: Dual Seal.
2. Primary Sealant: Polyisobutylene.

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3. Secondary Sealant: Silicone, General Electric IGS 3204 or IGS 3100, or Dow Corning 982.
 - a. For structurally glazed IG units, secondary seal shall conform to ASTM C 1249.
 - b. Primary and secondary seals shall not contain voids and must be continuously bonded to the glass structure.
4. Spacer: Clear finish aluminum with welded, soldered, or bent corners, hollow tube types, filled with low nitrogen absorption desiccant.
5. Desiccant: Molecular sieve, silica gel, or blend of both.
6. Interspace Content: Argon.
7. Glass Thickness: 1/4" minimum.
8. Low 'E' Coating: Provide high-performance, clear, metallic coating, "Solarban 70XL" as manufactured by Vitro Architectural Glass. Provide low 'E' coating having the following performance characteristics when applied to the No. 2 surface of 1" insulating units, both lites 1/4" clear:
 - a. Visible Light Transmittance: 64%.
 - b. Shading Coefficient: 0.32.
 - c. Solar Energy Transmittance: 25%.
 - d. Solar Heat Gain Coefficient (SHGC): 0.27.
 - e. U-Value: 0.29 winter, 0.27 summer.
9. Units shall be certified for compliance with seal classification "CBA" by the Insulating Glass Certification Council (IGCC) or by IGMA, and tested in accordance with the above ASTM Test Methods.
10. Insulating glass shall conform to the following tolerances:
 - a. Length and Width: + 3.0 mm/ -2.0 mm.
 - b. Diagonal: +/- 3.0 mm.
 - c. Thickness: As agreed +/- 1.0 mm.
 - d. Edge-Deletion of Coating: Minimum 8 mm wide. Width of deletion must be more than the width of the secondary seal. Silver layer(s) must be completely removed. Appearance must be uniform.
 - e. Primary PIB Seal: Must be complete with no breaks. Appearance must be uniform. PIB bead must overlap coating. No visible bright line when glass is viewed in transmission. The width of the PIB bead shall be 4.0 mm + 3.0/ - 1.5 mm.
 - f. Secondary Seal: Nominal 6 mm + 3.0/ - 1.5 mm. The minimum width of the secondary silicone seal for IG units that are glazed structurally must be determined according to ASTM C 1249. The secondary seal must be

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uniformly applied without bubbles, cavities or gaps. Avoid excess sealant that will need to be trimmed off later.

11. Additional requirements and properties for primary and secondary insulating glass seals and spacers:
 - a. All glass units shall comply with IGMA Guidelines which limits the dimension of the visible edge seal encroachment into the vision area to be no greater than the sightline infringement of 3mm (0.12").
 - b. Insulating glass unit hermetic seal to consist of butyl primary and silicone secondary seals with bent, welded, or soldered interpane spacer corners; keyed corners are not acceptable unless also soldered or welded. Spacers shall be aluminum or stainless steel. Locate spacer joint at the top or sides of the units, but in no instances at the sill. Design units to minimize the number of spacer joints. Provide solid keys, embedded in butyl sealant on all four sides, at spacer joints.
 - c. Hermetic seals must be continuous and intimately bonded to both lites of glass. Provide primary seal of uniform depth with a nominal width of 1/8" to 3/16". Hermetic seals shall not be contaminated with debris, fingerprints, or other foreign matter and shall not contain voids or air pockets that decrease the width of the seal below the minimum widths listed in these Specifications, or that breach the seal. The width of the primary seal shall not be less than 1/16", and the total cumulative length of the primary seal between 1/16" and 1/8" shall be less than 12" in any one insulating glass unit. The primary seal shall not have a reduced thickness at the corners. An increased thickness of the primary seal at the corners is acceptable.
 - d. Provide secondary seal of uniform depth with a nominal width of 1/4". Provide a total width of the primary and secondary seal of 1/2". Units shall carry CBA rating as established by ASTM E 774 and shall meet SIGMA 65- 7-2, latest edition. Units shall not contain breather or capillary tubes or similar penetrations.
- H. Security Glazing: Provide triple insulating glass unit consisting of 10mm clear, tempered, low-iron exterior lite with Low E coating on No. 2 face, 13mm argon-filled interspace, 8mm tempered, low-iron center lite, 13mm argon-filled interspace, and "School Guard SG4" interior lite.
- I. Fire-Rated Glazing Material: Proprietary product in the form of clear flat sheets of 3/16" nominal thickness weighing 2.5 lb./sq. ft., and as follows:
 1. Fire Protection Rating: As required by Code for the fire rated opening in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
 2. Product: "Premium FireLite" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.

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- J. Frameless Mirrors: 1/4", Quality q2, clear float glass with silver, copper, and organic coating, edges uniformly ground and polished.

2.3 GLAZING MATERIALS AND PRODUCTS

- A. General: Provide sealants and gaskets with performance characteristics suitable for applications indicated. Ensure compatibility of glazing sealants with insulating glass sealants, with laminated glass interlayers, and with any other surfaces in contact.
- B. General Glazing and Cap Bead Sealant: Provide sealant with maximum Shore A hardness of 50. Provide one of the following:
 - 1. Dow Corning 795.
 - 2. General Electric Silglaze N 2500 or Contractors SCS-1000.
 - 3. Tremco Spectrem 2.
- C. Weather Seal Sealant: Provide non-acid curing sealant with movement range $\pm 50\%$, ASTM C 719. Provide one of the following:
 - 1. Dow Corning 795.
 - 2. General Electric Silpruf.
 - 3. Tremco Spectrem 2.
- D. Backer Rod: Closed cell non-gassing polyethylene rod with rod diameter 25% wider than joint width.
- E. Dense Elastomeric Compression Seal Gaskets: Provide molded or extruded neoprene or EPDM gaskets, Shore A hardness of 75 ± 5 for hollow profile, and 60 ± 5 for solid profiles, ASTM C 864.
- F. Cellular, Elastomeric Preformed Gaskets: Provide extruded or molded closed cell, integral-skinned neoprene, Shore A 40 ± 5 , and 20% to 35% compression, ASTM C 509; Type II.
- G. Preformed Glazing Tape: Provide solvent-free butyl-polyisobutylene rubber with 100% solids content complying with ASTM C 1281 AAMA A 800 with integral continuous EPDM shim. Provide preformed glazing tape in extruded tape form. Provide Tremco "Polyshim II" or approved equal.
- H. Setting Blocks: Provide 100% silicone blocks with Shore A hardness of 80-90. Provide products certified by manufacturer to be compatible with silicone sealants. Length to be not less than 4". Width for setting blocks to be 1/16" more than glass thickness and high enough to provide the lite recommended by glass manufacturer. When thickness of setting block exceeds 3/4" the glass manufacturer must be

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consulted for sizes and configuration. In a vented system, setting block shall be designed so as to not restrict the flow of water within the glazing rabbet to the weep holes.

1. Shims: For shims used with setting blocks, provide same materials, hardness, length and width as setting blocks.
2. Structural Silicone Glazing: Provide silicone setting blocks where structural silicone occurs at sills and at insulating units with silicone edge seals.
- I. Edge Blocks: Provide neoprene or silicone as required for compatibility with glazing sealants. Provide blocks with Shore A hardness of 55 ± 5 .
- J. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place.
- K. Miscellaneous Glazing Materials: Provide sealant backer rods, primers, cleaners, and sealers of type recommended by glass and sealant manufacturers.
- L. Mirror Adhesive: Palmer's "Mirro-Mastic," or approved equal. Mastic must be compatible with mirror backing.
 1. Clips: No. 4 finish Type 304 stainless steel.

2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep system.
 3. Minimum required face or edge clearances.

4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GENERAL GLAZING STANDARDS

A. Install products using the recommendations from the manufacturer of glass, sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those in the GANA "Glazing Manual."

B. Verify that Insulating Glass Unit (IGU) secondary seal is compatible with glazing sealants.

C. Install glass in prepared glazing channels and other framing members.

D. Install setting blocks in rabbets as recommended by referenced glazing standards in GANA's "Glazing Manual" and IGMA's "Glazing Guidelines."

E. Provide bite on glass, minimum edge and face clearances and glazing material tolerances recommended by GANA's "Glazing Manual."

F. Provide weep system as recommended by GANA's "Glazing Manual."

G. Set glass lites in each series with uniform pattern, draw, bow and similar characteristics.

H. Distribute the weight of glass unit along the edge rather than the corner.

I. Comply with manufacturers and referenced industry standards on expansion joint and anchors; accommodating thermal movement; glass openings; use of setting blocks, edge, face, and bite clearances; use of glass spacers; edge blocks and installation of weep systems.

J. Protect glass edge damage during handling and installation.

K. Prevent glass from contact with contaminating substances that result from construction operations, such as weld spatter, fireproofing or plaster.

L. Remove and replace glass that is broken, chipped cracked or damaged in any way.

3.4 GLAZING

A. Glazing channel dimensions, as indicated on Shop Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

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- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead. Install setting blocks at the one greater points of each lite along the horizontal mullion.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- K. Flush Glazing
 - 1. If the butt joint in the metal framing is in the vertical direction, the glazier shall run the tape initially on the head and sill members going directly over this joint. Should

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the butt joint in the metal framing run horizontally, tapes must first be applied to the jambs so that it crosses over the joint.

2. Each tape section shall butt the adjoining tape and be united with a tool to eliminate any opening.
3. Do not overlap the adjoining length of tape or rubber shim as this will prevent full contact around the perimeter of glass.

L. Off-Set Glazing

1. Where the glazing legs are off-set, the difference in the rabbet width shall be compensated by employing different glazing tapes with different diameter shims. The difference in shim shall be equal to the size of the off-set. The thinner tape shall be positioned first on the glazing leg closest to the interior. The thicker tape shall be cut to the exact length of the dimension between the applied tapes, and installed on the outermost glazing leg.
2. Immediately prior to setting glass, paper backing shall be removed. Apply a toe bead of sealant 6" in each direction, from each corner.
3. Locate setting blocks in the sill member at quarter points, or if necessary to within 6" of each corner. Setting blocks must be set equal distance from center line of the glass and high enough to provide the recommended bite and edge clearances.
4. Set edge block according to glass manufacturer's recommendations.
5. Set Glass: The glass shall be pressed firmly against the tape to achieve full contact.
6. In a vented system, apply a heel bead (air seal) of sealant around the perimeter of glass, between the sole of the I.G. unit and the base of the rabbet of the metal framing developing a positive bond to the unit and to the metal framing. The bead of the sealant shall be deep enough so that it will partially fill the channel to a depth of 1/4" between the glass edge and the base of the metal framing rabbet.
7. Interior stops shall be set, and glazing tape spline for the appropriate face clearance shall be rolled into place, compressing the glass to the shim within the glazing tape.

3.5 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

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- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant as recommended by glass manufacturer or glass frame manufacturer.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape where noted on approved shop drawings.

3.6 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

3.7 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
 - 1. Exterior glazing gasket shall be set a minimum of 1/8" below exterior glazing stop to create a channel for sealant installation.

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- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.8 FRAMELESS MIRRORS

- A. Apply mastic to back of mirror "pats" spaced 4 pats/sq. ft.; adjust mirror so that it is plumb and in place to avoid distortion of reflecting images. Allow 1/8" space between back of mirror and wall surface.
 - 1. Apply "pats" using Palmer Electric Applicator.
- B. Apply stainless steel clips at mirror top and bottom; securely clip to substrate using non-corrosive anchors. At drywall back-up anchors must be secured to studs or steel wallplate spanning from stud to stud.

3.9 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Clean excess sealant or compound from glass and framing members immediately after application, using solvents or cleaners recommended by manufacturers.
- F. Glass to be cleaned according to:
 - 1. GANA Glass Information Bulletin GANA 01-0300 – "Proper Procedure for Cleaning Architectural Glass Products."
 - 2. GANA Glass Informational Bulletin GANA TD-02-0402 – "Heat Treated Glass Surfaces are Different."

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G. Do not use razor blades, scrapers or metal tools to clean glass.

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SECTION 09 23 00

LATHING AND PLASTERING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor materials, equipment and services necessary to complete the lathing and plastering as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Metal lath and support systems.
 - 2. Gypsum plaster for interior ceiling applications.
 - 3. Accessories.

1.3 RELATED SECTIONS

- A. Painting - Section 09 90 00.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: For actual installation of lath and plaster, use only skilled journeyman plasterers with a minimum of 5 years' experience who are completely familiar with the referenced standards and with the requirements for this work.
- B. Work of this Section shall conform to the following minimum standards:
 - 1. ASTM B 69 – Specification for Rolled Zinc
 - 2. ASTM C 841 - Standard Specification for Installation of Interior Lathing and Furring
 - 3. ASTM C 842 - Standard Specification for Application of Interior Gypsum Plaster
 - 4. ASTM C 1063 - Standard Specification for Installation of Lathing and Furring for Portland Cement-Based Plaster
 - 5. ASTM C 847 - Standard Specification for Metal Lath
 - 6. ASTM C 933 - Standard Specification for Welded Wire Lath

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7. ASTM C 28 - Standard Specification for Gypsum Plasters
8. ASTM C 631-81 - Standard Specification for Bonding Compounds for Interior Plastering
9. ASTM C 35 - Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster
10. ASTM C 206 - Standard Specification for Finishing Hydrated Lime

- C. Allowable Tolerances: For flat surfaces, do not exceed 1/8" in 10'-0" for bow or warp of surface, and for plumb or level.
- D. Plaster ceiling and soffit assemblies shall be fabricated and installed so that deflection of plaster surfaces does not exceed L/360.

1.5 SUBMITTALS

- A. Materials List: Before any lath and plaster materials are delivered to the job site, submit to the Architect a complete list of all materials proposed to be furnished and installed under this portion of the Work, samples of all accessories, and copies of the manufacturer's current recommendations as to methods and installation.
- B. Shop Drawings: Submit shop drawings of furring and lathing framing and control joint locations. Shop drawings shall detail the installation of lath, including lath discontinuity, lath fastening and fastener support requirements.
- C. Samples: Submit 12" x 12" sample panels of plaster showing finish described herein.

1.6 PRODUCT HANDLING

- A. General
 1. Deliver all manufactured products to the site in their original unopened containers with all labels intact and legible at the time of use.
 2. Do not permit scattering of materials or equipment but use all means necessary to ensure neatness of the site and structure at all times.
 3. Perform all cleaning of tools and equipment only in the areas set aside for that purpose.
- B. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

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1.7 JOB CONDITIONS

- A. Environmental Conditions: Comply with referenced standards.
- B. Protect contiguous work from soiling, spattering, moisture deterioration and other harmful effects which might result from plastering.

PART 2 PRODUCTS

2.1 METAL PRODUCTS

- A. Lath
 - 1. Provide galvanized steel, large opening diamond mesh lath weighing 3.4 lbs. per sq. yd. for interior use, and 3.6 lbs. per sq. yd. for exterior use, complying with ASTM C 847 with G-90 galvanized coating.
- B. Main Carrying Channels: Provide 1-1/2" cold rolled galvanized steel carrying channels weighing 475 lbs. per 1000 lin. ft. Space channels 3'-0" o.c. Galvanizing shall conform to ASTM A-653, G-90 coating.
- C. Furring Channels: Provide 3/4" cold rolled galvanized steel furring channels weighing 300 lbs. per 1000 lin. ft. Space furring channels 16" o.c. Galvanizing shall conform to ASTM A-653, G-90 coating.
- D. Hangers and Supports
 - 1. Provide hot rolled galvanized steel rod hangers 1/4" dia.; space hangers 3'-0" o.c. or 1" x 3/16" galvanized steel flat bars. Galvanizing shall conform to ASTM A-653, G-90 coating.
 - 2. Provide 18 ga. galvanized wire ties for lathing and accessories.
 - 3. Hanger Anchorage Devices: Galvanized steel screws, clips, bolts, cast-in-place concrete inserts or other devices applicable to the method of structural anchorage for ceiling hangers and whose suitability for use intended has been proven through standard construction practices or by certified test data. Size devices for 3 x calculated hanger loading except size direct pull-out concrete inserts for 5 x calculated hanger loading.
- E. Metal Plastering Accessories and Reinforcement
 - 1. General: Coordinate depth of accessory with thickness of and number of coats of plaster to be applied. Unless otherwise noted, all accessories shall be of zinc alloy material conforming to ASTM B-69.
 - 2. Small-Nose Corner Beads: General purpose type with expanded perforated flanges.

3. Cornerite: Manufacturer's standard preformed interior corner reinforcement made from 2.5 lb. per sq. yd. diamond mesh lath.
4. Square-Edged Casing Beads: Manufacturer's standard with expanded or short flange to suit application.
5. Two-Piece Control Joints: Manufacturer's standard roll-formed pair of casing beads with modified back flanges providing positive slip joint action and dust barrier, adjustable for joint width variation of 1/8" to 5/8".
 - a. The Contractor may, at his option, provide "Double J" (XJ-15) expansion joint fabricated of hot dipped galvanized steel made by California Expanded Metal Lath Products Co.
6. Corner Reinforcement: Special stucco-type woven galvanized wire corner reinforcing strips.
7. Line Wire: 18 ga. soft galvanized steel wire.
8. Fasteners: Galvanized steel, of type and length suitable for adequate penetration of the substrate.

2.2 GYPSUM PLASTER SYSTEM

A. Materials

1. Aggregate: Sand for Gypsum plaster shall conform to the requirements of ASTM C 35, latest edition.
2. Hydrated lime shall conform to the requirements of ASTM C 206.
3. Binder shall be hair or fiber as recommended by the plaster manufacturer.
4. Gypsum neat plaster and calcined gypsum shall conform to the requirements of ASTM C 28, latest edition.
5. Prepared Finish Coat: Factory prepared finish for gypsum plaster, type recommended by the manufacturer for smooth troweled finish.

B. Gypsum Plaster on Metal Lath

1. Scratch coat shall consist of one (1) part gypsum plaster to not more than two (2) parts sand by weight. If plaster is unfibered, add the proper amount of fiber as recommended by the plaster manufacturer.
2. Brown coat shall consist of one (1) part gypsum plaster to not more than three (3) parts sand by weight.

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3. Finish coat shall be factory prepared mix as noted above.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where lathing and plastering is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PREPARATION

- A. Ceiling Anchorages: Coordinate work with structural ceiling work to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling hangers.
 1. Furnish concrete inserts, steel deck hanger clip and similar devices to other trades for installation well in advance of time needed for coordination with other work.

3.3 INSTALLATION OF METAL LATH AND SUPPORT SYSTEM FOR CEILINGS AND SOFFITS

- A. Where lathing and metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate the work from structural movement sufficiently to prevent transfer of loading into the work from the building structure. Install slip or cushion type joints to absorb deflections and maintain lateral support. Frame both sides of control and expansion joints independently, and do not bridge joints with furring and lathing or accessories.
- B. Install supplementary framing, blocking and bracing where required to support fixtures, grilles, etc., within plaster ceilings and soffits.
- C. Splicing Members: Lap furring members 8" and runner channels 12", and wire-tie near each end of lap. Splice plastering accessories by use of concealed splines, anchored to prevent offsets.
- D. Space main carrying channels 3'-0" o.c.; level channels to a tolerance of 1/8" in 10'-0" and space hangers along channels 3'-0" o.c.
- E. Secure hangers to channels and to ceiling inserts by looping and wire-tying.
- F. Wire tie furring channels to main carrying channel 16" o.c. Install metal lath to furring channels by wire-tying or clipping to furring channels in accordance with industry standards.
- G. Install furring and lathing plumb, level and true to line with a tolerance of 1/8" in 10'-0"

and in accordance with industry standards. Space expansion joints as indicated on drawings.

- H. Metal lath shall be applied with the long dimension of the sheet across the supports. Lap sheets not less than 2" at sides and not less than 3" at ends. End laps shall occur only at supports. Secure lath to supports 6" o.c. max. Provide a tie in side laps at each support and midway between supports.

3.4 SELF-FURRING LATH

- A. Lap lath 1" at ends and 2" at laps. Fasten lath to solid back-up using non-corrosive masonry screw anchors spaced 8" o.c. both directions that penetrate substrate a minimum of 2".

3.5 INSTALLATION OF PLASTERING ACCESSORIES

- A. Anchor accessories to the plaster base or substrate 8" o.c. along each flange, by wire tying to lath.
- B. Miter or cope exposed portions of accessory items at corners, and install with tight joints. Spline splices to avoid offsets; conceal splines.
- C. Set exposed accessories plumb, level and true to line, with a tolerance of 1/8" in 10'-0". Shim as required and align units with adjoining work in a manner which will produce the best possible visual effect.
- D. Install metal casing beads where shown and at the following locations:
 - 1. At openings and terminations of plaster finish where otherwise edge of plaster would be exposed.
 - 2. Where interior plaster abuts adjacent wall.
 - 3. Where interior plaster abuts other finish, and termination is not lapped by other finish.
- E. Install metal corner beads at external corners.
- F. Install control joints where indicated on approved shop drawings; space control joints in accordance with ASTM C 841 and ASTM C 1063.
 - 1. Mount control joint flanges by wire ties to the lath only

3.6 GENERAL PLASTERING REQUIREMENTS

- A. Mechanically mix plaster materials at the project site; do not hand mix except where small amounts are needed, using less than one bag of plaster material.
- B. Sequence plaster installation properly with the installation and protection of other work,

so that neither will be damaged by the installation of other work.

- C. Cut out and replace all unbonded spots. Build in the work of others and do all cutting and patching of plaster in this connection. Where abutting other built-in materials, plaster shall be finished tightly against them and be neatly trimmed.
- D. Repair surface defects. Surfaces shall be within 1/32" to 1/16" of true plane.
- E. Plaster thicknesses noted herein or on drawings shall be considered as a minimum; plaster shall be of such thickness required to plumb and square wall surfaces, and to level ceilings so that plaster is flush with adjacent surfaces.

3.7 CEMENT LIME STUCCO APPLICATION

- A. Environmental Conditions: When there is no danger of freezing for a period of 48 hours after application and surface temperature can be maintained at 50 deg. F. during the hydration period, stucco work may proceed.

3.8 GYPSUM PLASTER APPLICATION

- A. Scratch Coat: Scratch coat shall be full and approximately 3/8" thick, applied with sufficient force to form good keys. Scratch coat shall be evenly cross-scratched upon attaining its initial set and shall be kept damp with a fog spray for 48 hours.
- B. Brown Coat: Brown coat shall be applied after the scratch coat has set, but not less than forty-eight (48) hours after the application of the scratch coat. Apply with sufficient force to ensure tight contact with scratch coat.
 - 1. All joints in brown coat plaster shall be lap joints.
 - 2. After drying, all shrinkage cracks shall be cut out and filled with scratch coat plaster.
- C. Finish Coat: Finish shall be applied over brown coat, which has set and is surface dry, shall be scratched in thoroughly, laid on well, doubled back, and filled out to a true, even surface. The thickness shall be from 1/16" to 1/8". The finish shall be allowed to draw a few minutes and then shall be well troweled with water to a smooth surface, free from blemishes and trowel marks. Finish flat plaster items true and even within 1/8" tolerance in 10'-0".
- D. Total thickness of gypsum plaster shall be no less than 5/8".

3.9 CUTTING AND PATCHING

- A. Cut, patch, point-up and repair plaster as necessary to accommodate other work and to restore work, free from cracks, dents and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects, including areas of the work which do not

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comply with specified tolerances, and where bond to the substrate has failed.

- B. Sand plaster lightly to remove trowel marks and arrises.

3.10 CLEANING AND PROTECTION

- A. Promptly remove plaster from surfaces which are not to be plastered. Repair floors, walls and other surfaces which have been stained, marred or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers and equipment and clean floors of plaster debris.

END OF SECTION

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SECTION 09 29 00

GYPSUM DRYWALL

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the gypsum drywall as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Gypsum board work for partitions, ceilings, column enclosures, furring, and elsewhere where gypsum drywall work is shown on drawings.
 - 2. Metal supports for gypsum drywall construction.
 - 3. Acoustical insulation for gypsum drywall work.
 - 4. Sealant for gypsum drywall work.
 - 5. Concealed metal reinforcing for attachment of railings, toilet partitions and other items supported on drywall partitions and walls.
 - 6. Taping and finishing of drywall joints.
 - 7. Installing rings and frames in drywall surfaces for grilles, registers and lighting fixtures.
 - 8. Gypsum shaft wall construction.
 - 9. Bracing and connections.

1.3 RELATED SECTIONS

- A. Steel Doors and Frames - Section 08 11 13.
- B. Painting and Finishing - Section 09 90 00.

1.4 QUALITY ASSURANCE

- A. The following standards, as well as other standards which may be referred to in this

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Section, shall apply to the work of this Section:

1. The Gypsum Construction Handbook, latest edition, USG.
 2. Construction Guide, latest edition, National Gypsum.
 3. ASTM A 568 "Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For"
 4. ASTM C 475 "Standard Specification for Joint Treatment Materials for Gypsum Wallboard Construction"
 5. ASTM C 645 "Standard Specification for Non-Structural Steel Framing Members"
 6. ASTM C 754 "Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products"
 7. ASTM C 840 "Standard Specification for Application and Finishing of Gypsum Board"
 8. ASTM C 919 "Standard Specification for Use of Sealants in Acoustical Applications"
 9. ASTM C 954 "Standard Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.033 in. to 0.112 in. in Thickness"
 10. ASTM C 1002 "Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Board"
 11. ASTM C 1177 "Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing"
 12. ASTM C 1178 "Standard Specification for Glass Mat Water Resistant Gypsum Backing Board"
 13. ASTM C 1278 "Standard Specification for Fiber-Reinforced Gypsum Panel"
 14. ASTM C 1396 "Standard Specification for Gypsum Board"
 15. ASTM D 3273 "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber"
- B. Allowable Tolerances: 1/32" offsets between planes of board faces, and 1/16" in 8'-0" for plumb, level, warp and bow.
- C. System Design Load
1. Provide standard drywall wall assemblies designed and tested by manufacturer to

withstand a lateral load of 5 lbs. per sq. ft. for the maximum wall height required, and with deflection limited to L/240 of partition height.

- a. Drywall assemblies with tile finish shall have a deflection limit of L/360.
2. Provide drywall ceiling assemblies designed, fabricated and installed to have a deflection not to exceed L/360.
- D. Fire-Resistance Rating: Where gypsum drywall with fire resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories, or to design designations in UL "Fire Resistance Directory" or in listing of other testing agencies acceptable to authorities having jurisdiction, and compliant with UL Test #2079; criteria for cycle movement for all field height wall sections requiring allowance for vertical deflection within framing details.
- E. Installer: Firm with not less than 5 years of successful experience in the installation of specified materials.

1.5 SUBMITTALS

- A. Submit shop drawing for each drywall partition, furring and ceiling system showing size and gauges of framing members, hanger and anchorage devices, wallboard types, insulation, sealant, methods of assembly and fastening, control joints indicating column lines, corner details, joint finishing and relationship of drywall work to adjacent work.
- B. Samples: Each material specified herein, 12" x 12", or 12" long, or in manufacturer's container, as applicable for type of material submitted.
- C. Manufacturer's Literature: Submit technical and installation instructions for each drywall partition, furring and ceiling system specified herein, and for each fire-rated and sound-rated gypsum board assembly. Submit other data as required to show compliance with these specifications, including data for mold resistant joint compound.
- D. Test Reports: This Contractor shall submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to required fire ratings and sound ratings.

1.6 PRODUCT HANDLING AND PROTECTION

- A. Deliver, store and handle drywall work materials to prevent damage. Deliver materials in their original, unopened containers or bundles, and store where protected from moisture, damage and from exposure to the elements. Store wallboard in flat stacks.
- B. Protect wallboard from becoming wet.
- C. Protect metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI's "Code of Standard Practice."

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1.7 ENVIRONMENTAL CONDITIONS

- A. Provide and maintain minimum temperature of fifty-five (55) degrees F. and adequate ventilation to eliminate excessive moisture within the building in the area of the drywall work for at least twenty-four (24) hours, prior to, during and after installation of drywall work. Installation shall not start until windows are glazed and doors are installed, unless openings are temporarily closed. Space above suspended ceilings shall be vented sufficiently to prevent temperature and pressure build up.

1.8 JOB MOCK-UP

- A. At a suitable location, where directed by the Architect, lay up a portion of a finished wall and ceiling demonstrating the quality of work, including finishing, to be obtained under this Section. Omit drywall boards in locations as directed by the Architect to show stud spacing and attachments; after acceptance, complete assembly.
- B. Adjust the finishing techniques as required to achieve the finish required by the Architect as described in this Section of these specifications.
- C. Upon approval of the mock-up, the mock-up may be left in place as a portion of the finished work of this Section.
- D. All drywall work shall be equal in quality to approved mock-up.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers for Gypsum Drywall Panels and Accessories: U.S. Gypsum Co., Georgia Pacific, CertainTeed Corporation, Continental Building Products, or National Gypsum Co. meeting specification requirements are acceptable.
 - 1. All drywall products must be manufactured in North America.
- B. Acceptable Manufacturers for Metal Supports of Drywall Assemblies: Unless otherwise noted, provide products manufactured by ClarkDietrich, Super Stud Building Products, Marino/Ware, or approved equal.

2.2 METAL SUPPORTS

- A. Metal Floor and Ceiling Runners
 - 1. Drywall Track: Formed from 0.0312 inch (20 U.S. Std. gauge) (unless otherwise noted) cold formed steel, width to suit shaped metal studs. Use 20 ga. top runners with 1-1/4" minimum flanges.
 - 2. Deflection track or head of wall connections at rated partitions shall conform to UL

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#2079 for cycle movement. Provide positive mechanical connection of framing to structure, allowing for vertical movement within connections. Minimum of 0.0312 (20 ga.) cold formed steel for clips, 25 ga. cold formed steel for deflection track.

- a. Product: "BlazeFrame DSL" or "MaxTrak Slotted Deflection Track" as manufactured by ClarkDietrich, "VertiClip" or "VertiTrack" as manufactured by the Steel Network or equal made by Metal-Lite Inc.
 - b. FireTrak (including stud clips) by FireTrak Corp. or equal made by Metal-Lite Inc.
3. Shaft Wall "J" Type Runner: Formed from 0.0329" (20 U.S. Std. gauge) galvanized steel, 1" x 2-1/2" or 4" wide (to suit detail) x 2-1/4" (for shaft wall).

B. Metal Studs, Framing and Furring

1. C-Shaped Studs: Channel type with holes for passage of conduit formed from minimum 0.0312 inch (20 U.S. Std. gauge) (unless heavier gauge is required to meet deflection limits) cold formed steel, width as shown on drawings.
2. Furring Channels: Hat shaped, formed from galvanized steel, 25 U.S. Std. gauge.
 - a. Product: ClarkDietrich; Furring Channel, or comparable product.
3. "C-H," "CT," or "I" Type Stud: 1-1/2" x 2-1/2", 4" or 6" wide (to suit detail) galvanized steel. Use for shaft wall construction; gauge and size as required to meet deflection limits given herein.
 - a. Product: ClarkDietrich; CT Stud, or a comparable product.
4. Double "E" Type Stud or "J" Track with Holding Tabs: 1" x 2-1/2", 4" or 6" wide (to suit detail) galvanized steel. Use for shaft wall construction; gauge and size as required to meet deflection limits given herein.
 - a. Product: ClarkDietrich; J-Tabbed Track, or a comparable product.
5. Continuous 16 gauge x 8" wide steel wall plate screwed to studs as required for support of railings, toilet partitions and other items supported on drywall partitions and walls.

C. Suspended Ceiling and Fascia Supports

1. Main Runners: 1-1/2" steel channels, cold rolled at 0.475 lbs. per ft., rust-inhibitive paint finish.
2. Furring Members: Screw-type hat-shaped furring channels of 25 ga. zinc-coated steel; comply with ASTM C 645.
3. Hangers: Galvanized, 1" x 3/16" flat steel slats capable of supporting 5x

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calculated load supported.

4. Hanger Anchorages: Provide inserts, clips, bolts, screws and other devices applicable to the required method of structural anchorage for ceiling hangers. Size devices for 5x calculated load supported.

5. Furring Anchorages: 16 ga. galvanized wire ties, manufacturer's standard clips, bolts or screws as recommended by furring manufacturer.

- D. Protective Coating: All cold-formed steel members shall have coating conforming to AISI S220; ASTM A 653, G60 or coating with equivalent corrosion resistance of ASTM A653/A653M, G60. Galvannealed products are not acceptable

2.3 GYPSUM WALLBOARD TYPES

- A. Gypsum Wallboard: 5/8" thick "Sheetrock" by USG, "Gold Bond" by National Gypsum, or "Regular Gypsum" by CertainTeed Corp., 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- B. Gypsum Ceiling Board: 5/8" thick, sag-resistant, long edges tapered.
- C. Fire-Rated Gypsum Wallboard: 5/8" thick "Sheetrock Firecode C" by USG, "Firecheck Type C" by Lafarge/Continental, "Gold Bond Fireshield" by National Gypsum, or "Type C" by CertainTeed Corp., 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- D. Cement Board Backing for Tile Finish: 5/8" thick "Durock Tile Backer Board" by USG, "Wonder Board Lite" by Custom Building Products or approved equal.
- E. Moisture/Mold-Resistant Gypsum Wallboard (at all exterior walls and wet areas): 5/8" thick "Mold Tough," "Mold Tough FR," by U.S. Gypsum, "DensArmor Plus" by Georgia Pacific, Lafarge "Mold Defense" and/or Lafarge "Mold Defense Type X," or "Gold Bond EXP Interior Extreme Gypsum Board" by National Gypsum, 48" wide, in maximum lengths available to minimize end-to-end butt joints.
 1. Board must have a rating of 10 per ASTM D 3273 with a core that meets ASTM C 1396, Section 6 or ASTM C 1658.
- F. Mold-Resistant Shaft Wall Liner: Solid gypsum board liner for shaft wall construction, 1" thick, 24" wide, as required to suit condition, by standard lengths as required, beveled edges. Provide "Mold Tough Liner Panel" by USG, "DensGlass Ultra Shaft Guard" by Georgia Pacific, Lafarge "Mold Defense Shaftliner Type X" and/or Lafarge "Weather Defense Shaftliner Type X", "Gold Bond Brand Fireshield Shaft Liner XP" by National Gypsum or "Gold Bond Brand EXP Extended Exposure Shaft Liner" by National Gypsum.
 1. Liner board must have a rating 10 per ASTM D 3273 with a core that meets ASTM

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- G. Abuse-Resistant Wallboard: 5/8" thick "Sheetrock Brand Mold Tough AR" by USG, "Dens Armor Plus Abuse Resistant Panels" by Georgia-Pacific, "EXP Interior Extreme AR" or "Gold Bond Brand Hi-Abuse XP" by National Gypsum, "Protecta AR100" or "Protecta HIR 300" by Lafarge/Continental, or "AirRenew Extreme Abuse" by CertainTeed Corp., 48" wide, in maximum lengths available to minimize end-to-end butt joints.

1. Board must achieve a Level 1 rating per ASTM C 1629.

2.4 ACCESSORIES

- A. Acoustical Insulation: Paper-less, non-combustible, semi-rigid mineral fiber mat, 2" thick, in walls (unless otherwise indicated), 3 lb./cu. ft. maximum density; Thermafiber LLC "Thermafiber," or approved equal.
- B. Fasteners for Wallboard: USG Brand Screws; Type S Bugle Head for fastening wallboard to lighter gauge interior metal framing (up to 20 ga.). Type S-12 Bugle Head for fastening wallboard to heavier gauge interior metal framing (20 ga. to 12 ga.); Type S and Type S-12 Pan Head for attaching metal studs to door frames and runners; and Type G Bugle Head for fastening wallboard to wallboard. Lengths specified below under "Part 3 - Execution" Articles and as recommended by drywall manufacturer.
- C. Laminating Adhesive: "Sheetrock Brand Joint Compound."
- D. Metal Trim - Corner Beads: For 90 degree External Corners - ClarkDietrich; 103 Deluxe Cornerbeador "Dur-A-Bead" No. 103, 26 U.S. Std. ga. galvanized steel, 1-1/4" x 1-1/4", for 90 degree external corners.
- E. Metal Trim - Edge Beads: "Sheetrock Brand Paper Faced Metal Bead and Trim."
- F. Partition/Concrete Ceiling Trim: Trim-Tex Super Seal Tear Away or approved equal.
- G. Metal Trim Treatment Materials and Joint Treatment Materials for Gypsum Drywall Boards: Paper tape for joint reinforcing; Setting Type (Durabond 90) or Lightweight Setting Type Joint Compound for taping and topping; and Ready Mix Compound for finishing.
1. For mold-resistant drywall, water-resistant drywall and tile backer board, use glass mesh tape with setting joint compound that is rated 10 when tested in accordance with ASTM D 3273 and evaluated in accordance with ASTM D 3274. Acceptable joint compound is "Rapid Set One Pass" made by CTS Cement Manufacturing Corp. or "Rapid Joint" manufactured by Lafarge North America or approved equal meeting standards noted herein.
- H. Control Joints: ClarkDietrich; #093 Control Joint or No. 0.093, USG.

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- I. Acoustical Sealant: USG "Acoustical Sealant" or "Tremco Acoustical Caulking" of Tremco Mfg. Co., Masterseal NP520 by BASF or approved equal.
- J. Neoprene Gaskets: Conform to ASTM D 1056.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where gypsum drywall is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. General

- 1. Install drywall work in accordance with drywall manufacturer's printed instructions and as indicated on drawings and specified herein.
- 2. All metal framing for drywall partitions shall extend from floor to underside of structural deck above. Provide for vertical deflection with positive mechanical connections of framing members to structure.
- 3. Provide concealed reinforcement, 16 ga. thick by eight (8) inches wide or as detailed or as recommended by manufacturer, for attachment of railings, toilet partitions, and other items to be supported on the partitions which cannot be attached to the metal framing members. Concealed reinforcement shall span between metal studs and be attached thereto using two (2) self-tapping pan head screws at each stud.
 - a. Back of drywall shall be scored or notched to prevent bulging out where reinforcement plate occurs.

- B. Fire-Rated Assemblies: Install fire-rated assemblies in accordance with requirements of authorities having jurisdiction, Underwriters' Laboratories and test results obtained and published by the drywall manufacturer, for the fire-rated drywall assembly types indicated on the drawings.

- C. Acoustical Assemblies: Install acoustically-rated assemblies to achieve a minimum STC as noted on drawings, in accordance with test results obtained and published by the drywall manufacturer, for the drywall assembly type indicated on the drawings.

D. Sealant

- 1. Install continuous acoustical sealant bead at top and bottom edges of wallboard

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where indicated or required for sound rating as wallboard is installed, and between metal trim edge beads and abutting construction.

2. Install acoustical sealant in 1/8" wide vertical control joints within the length of the wall or partitions, and in all other joints, specified below under "Control Joints." Install bead of acoustical sealant around electric switch and outlet boxes, piping, ducts, and around any other penetration in the wallboard; place sealant bead between penetrations and edge of wallboard.
3. Where sealant is exposed to view, protect adjacent surfaces from damage and from sealant material, and tool sealant flush with and in same plane as wallboard surface. Sealant beads shall be 1/4" to 3/8" diameter.

E. Wallboard Application

1. Do not install wallboard panels until steel door frames are in place; coordinate work with Section 081113, "Steel Doors and Frames."
2. See drawings for all board types. Use fire-rated wallboard for fire-rated assemblies. Use sag-resistant board for ceilings. Use water-resistant wallboard where indicated on drawings and where wallboard would be subject to moisture. Install water-resistant wallboard in full, large sheets (no scraps) to limit number of butt joints.
3. Apply wallboard with long dimension parallel to stud framing members, and with abutting edges occurring over stud flanges.
4. Install wallboard for partitions from floor to underside of structure above and secure rigidly in place by screw attachment, unless otherwise indicated.
5. Provide "Thermafiber" safing insulation meeting standards of Section 078413 at flutes of metal deck where partitions carry up to bottom of metal deck.
6. Neatly cut wallboard to fit around outlets, switch boxes, framed openings, piping, ducts, and other items which penetrate wallboard, fill gaps with acoustic sealant.
7. Where wallboard is to be applied to curved surfaces, dampen wallboard on back side as required to obtain required curve. Finish surface shall present smooth, even curve without fluting or other imperfections.
8. Screw fasten wallboard with power-driven electric screwdriver, screw heads to slightly depress surface of wallboard without cutting paper, screws not closer than 3/8" from ends and edges of wallboard.
9. Where studs are doubled-up, screw fasten wallboard to both studs in a staggered pattern.

F. Cementitious Backer Board

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1. General: Furnish cementitious backer board in maximum available lengths. Install horizontally, with end joints over framing members.
 2. Fastening: Secure cementitious backer board to each framing member with screws spaced not more than 12 inches on center and not closer than 1/2" from the edge. Install screws with a conventional screw gun so that the screw heads are flush with the surface of the board.
 3. Joint Treatment: Fill space between edge of backer and receptor with dry-set Portland cement or latex-Portland cement mortar. Fill all horizontal and vertical joints and corners with dry-set Portland cement or latex-Portland cement mortar. Apply fiberglass tape over joints and corners and embed with same mortar.
- G. Metal Trim: Install and mechanically secure in accordance with manufacturer's instructions; and finish with three (3) coats of joint compound, feathered and finish sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions.
1. Corner Beads: Install specified corner beads in single lengths at all external corners, unless corner lengths exceed standard stock lengths.
 2. Edge Beads: Install specified edge beads in single lengths at all terminating edges of wallboard exposed to view, where edges abut dissimilar materials, where edges would be exposed to view, and elsewhere where shown on drawings. Where indicated on drawings, seal joint between metal edge bead and adjoining surface with specified gasket, 1/8" wide minimum and set back 1/8" from face of wallboard, unless other size and profile indicated on drawings.
 3. Casing beads shall be set in long lengths, neatly butted at joints. Provide casing beads at juncture of board and vertical surfaces and at exposed perimeters.
- H. Control Joint Locations: Gypsum board surfaces shall be isolated with control joints where:
1. Ceiling abuts a structural element, dissimilar wall or other vertical penetration.
 2. Construction changes within the plane of the partition or ceiling.
 3. Shown on approved shop drawings.
 4. Ceiling dimensions exceed thirty (30) feet in either direction.
 5. Wings of "L," "U," and "T" shaped ceiling areas are joined.
 6. Expansion or control joints occur in the structural elements of the building.
 7. Shaft wall runs exceed 30' without interruption.
 8. Partition or furring abuts a structural element or dissimilar wall or ceiling.

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9. Partition or furring runs exceed 30' without interruption.
10. Where control joints are required, ceiling height door frames may be used as control joints. Less than ceiling height frames shall have control joints extending to the ceiling from both corners.

I. Joint Treatment and Spackling

1. Joints between face wallboards in the same plane, joints at internal corners of intersecting partitions and joints at internal corners of intersections between ceilings and walls or partitions shall be filled with joint compound.
2. Screw heads and other depressions shall be filled with joint compound. Joint compound shall be applied in three (3) coats, feathered and finish surface sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions. Treatment of joints and screw heads with joint compound is also required where wallboard will be covered by finish materials which require a smooth surface, such as vinyl wall coverings.

3.3 FURRED WALLS AND PARTITIONS

- A. Use specified metal furring channels. Run metal furring channel framing members vertically, space sixteen (16) inches o.c. maximum. Fasten furring channels to concrete or masonry surfaces with power-driven fasteners or concrete stub nails spaced sixteen (16) inches o.c. maximum through alternate wing flanges (staggered) of furring channel. Furring channels shall be shimmed as necessary to provide a plumb and level backing for wallboard. At inside of exterior walls, an asphalt felt protection strip shall be installed between each furring channel and the wall. Furring channel and splices shall be provided by nesting channels at least eight (8) inches and securely anchoring to concrete or masonry with two (2) fasteners in each wing.
- B. Wallboard Installation: Same as specified under Article 3.4 - "Metal Stud Partitions."

3.4 METAL STUD PARTITIONS

- A. Unless otherwise noted, steel framing members shall be installed in accordance with ASTM C 754.
- B. Runner Installation: Use channel type. Align accurately at floor according to partition layout. Anchor runners securely sixteen (16) inches o.c. maximum with power-driven anchors to floor slab, with power-driven anchors to structural slab above. See "Stud Installation" below for runners over heads of metal door frames. Where required, carefully remove sprayed-on fireproofing to allow partition to be properly installed.
- C. Stud Installation
 1. Use channel type, positioned vertically in runners, spaced as noted on drawings, but not more than sixteen (16) inches o.c.

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2. Anchor studs to floor runners with screw fasteners. Provide snap-in or slotted hole slip joint bolt connections of studs to ceiling runners leaving space for movement. Anchor studs at partition intersections, partition corners and where partition abuts other construction to floor and ceiling runners with sheet metal screws through each stud flange and runner flange.
 3. Connection at ceiling runner for non-rated partitions shall be snap-in or slotted hole slip joint bolt connection that shall allow for movement. Seal studs abutting other construction with 1/8" thick neoprene gasket continuously between stud and abutting construction.
 4. Connections for fire rated partitions at ceiling runners shall conform to UL Design #2079.
 5. Install metal stud horizontal bracing wherever vertical studs are cut or wallboard is cut for passage of pipes, ducts or other penetrations, and anchor horizontal bracing to vertical studs with sheet metal screws.
 6. At jambs of door frames and borrowed light frames, install doubled-up studs (not back to back) from floor to underside of structural deck, and securely anchor studs to jamb anchors of frames and to runners with screws. Provide cross braces from hollow metal frames to underside of slab.
 7. Over heads of door frames, install cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs, and securely
 8. anchor runner to adjacent vertical studs with sheet metal screws. Install cut-to-length vertical studs from runner (over heads of door frame) to ceiling runner sixteen (16) inches maximum o.c. and at vertical joints of wallboard, and securely anchor studs to runners with sheet metal screws.
 9. At control joints, in field of partition, install double-up studs (back-to-back) from floor to ceiling runner, with 1/4" thick continuous compressible gasket between studs. When necessary, splice studs with eight (8) inches minimum nested laps and attach flanges together with two (2) sheet metal screws in each flange. All screws shall be self-tapping sheet metal screws.
- D. Runners and Studs at Chase Wall: As specified above for "Runners" and "Studs" and as specified herein. Chase walls shall have either a single or double row of floor and ceiling runners with metal studs sixteen (16) inches o.c. maximum and positioned vertically in the runners so that the studs are opposite each other in pairs with the flanges pointing in the same direction. Anchor all studs to runner flanges with sheet metal screws through each stud flange and runner flange following requirements of paragraph 3.4, B. Provide cross bracing between the rows of studs by attaching runner channels or studs set full width of chase attached to vertical studs with one self-tapping screw at each end. Space cross bracing not over thirty-six (36) inches o.c. vertically.

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E. Wallboard Installation - Single Layer Application (Screw Attached)

1. Install wallboard with long dimension parallel to framing member and with abutting edge joints over web of framing member. Install wallboard with long dimension perpendicular to framing members above and below openings in drywall extending to second stud at each side of opening. Joints on opposite sides of wall shall be arranged so as to occur on different studs.
2. Boards shall be fastened securely to metal studs with screws as specified. Where a free end occurs between studs, back blocking shall be required. Center abutting ends over studs. Correct work as necessary so that faces of boards are flush, smooth, true.
3. Wallboard screws shall be applied with an electric screw gun. Screws shall be driven not less than 3/8" from ends or edges of board to provide uniform dimple not over 1/32" deep. Screws shall be spaced twelve (12) inches o.c. in the field of the board and 8" o.c. staggered along the abutting edges.
4. All ends and edges of wallboard shall occur over screwing members (studs or furring channels). Boards shall be brought into contact but shall not be forced into place. Where ends or edges abut, they shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.
5. At locations where piping receptacles, conduit, switches, etc., penetrate drywall partitions, provide non-drying sealant and an approved sealant stop at cut board locations inside partition.

F. Wallboard Installation - Double-Layer Application

1. General: See drawings for wallboard partition types required.
2. First Layer (Screw Attached): Install as described above for single layer application.
3. Second Layer (Screw Attached): Screw attach second layer, unless laminating method of attachment indicated on drawings or necessary to obtain required sound rating or fire rating. Install wallboard vertically with vertical joints offset thirty-two (32) inches from first layer joints and staggered on opposite sides of wall. Attach wallboard with 1-5/8" screws sixteen (16) inches o.c. along vertical joints and sixteen (16) inches o.c. in the field of the wallboard. Screw through first layer into metal framing members.
4. Second Layer (Laminated): Install wallboard vertically. Stagger joints of second layer from first layer joints. Laminate second layer with specified laminating adhesive in beads or strips running continuously from floor to ceiling in accordance with manufacturer's instructions. After laminating, screw wallboard to framing members with 1-5/8" screws, spaced twelve (12) inches o.c. around perimeter of wallboard.

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- G. Wallboard Installation - Laminated Application: Where laminated wallboard is indicated, use specified laminating adhesive, install wallboard vertically and maintain tolerances as specified for screw attached wallboard.
- H. Insulation Installation: Install where indicated on drawings. Place blanket tightly between studs.
- I. Deflection of Structure Above: To allow for possible deflection of structure above partitions, provide top runners for non-rated partitions with 1-1/4" minimum flanges and do not screw studs or drywall to top runner. Where positive anchorage of studs to top runner is required, anchorage device shall be by means of slotted hole (in clip connection with screw attachment to web of steel through bushings located in slots of clips), or other anchorage device approved by Architect.
- J. Control Joints
 - 1. Leave a 1/2" continuous opening between gypsum boards for insertion of surface mounted joint.
 - 2. Back by double framing members.
 - 3. Attach control joint to face layer with 9/16" galvanized staples six (6) inches o.c. at both flanges along entire length of joint.
 - 4. Provide two (2) inch wide gypsum panel strip or other adequate seal behind control joint in fire rated partitions and partitions with safin insulation.

3.5 DRYWALL FASCIAS AND CEILINGS

- A. Furnish and install inserts, hanger clips and similar devices in coordination with other work.
- B. Secure hangers to inserts and clips. Clamp or bolt hangers to main runners.
- C. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
- D. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
- E. Metal Furring Channels: Space sixteen (16) inches o.c. maximum. Attach to 1-1/2" main runner channels with furring channel clips (on alternate sides of main runner channels). Furring channels shall not be let into or come in contact with abutting masonry walls. End splices shall be provided by nesting furring channels no less than eight (8) inches and securely wire tying. At any openings that interrupt the furring channels, install additional cross reinforcing to restore lateral stability.
- F. Mechanical accessories, hangers, splices, runner channels and other members used in suspension system shall be of metal, zinc coated, or coated with rust inhibitive paint, of

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suitable design and of adequate strength to support units securely without sagging, and such as to bring unit faces to finished indicated lines and levels.

1. Provide special furring where ducts are over two (2) feet wide.

- G. Apply board with its long dimension at right angles to channels. Locate board butt joints over center of furring channels. Attach board with one (1) inch self-drilling drywall screws twelve (12) inches o.c. in field of board at each furring channel; eight (8) inches o.c. at butt joints located not less than 3/8" from edges.

3.6 SHAFT WALLS

- A. Runner Installation: Use "J" metal runners at floor and ceiling, with the short leg toward finish side of wall. Securely attach runners to structural supports with power-driven fasteners at both ends and twenty-four (24) inches o.c.
- B. Shaft Wall Liner: Cut shaft wall liner panels one (1) inch less from floor to ceiling height and erect vertically between J-runners.
- C. C-H Studs: Cut metal studs 3/8" to not more than 1/2" less than floor to ceiling height and install between shaft wall liner panels so that panels are fitted snugly into the one (1) inch wide "H," "T," or "I" portion of the stud. Space studs twenty-four (24) inches o.c., unless otherwise indicated on drawings. Install full-length steel E-Studs or J-runners vertically at T-intersections, corners, door jambs, and columns. Install full length E-Studs or J-runners over shaft wall liner both sides of closure panels. Frame openings cut within a liner panel with J-Runner around perimeter. For openings, frame with vertical E-Stud or J-runner at edges, horizontal runner at head and sill, and reinforcing as shown on the drawings. Suitably frame all openings to maintain structural support for wall. Over metal doors, install a cut to length section of runner and attach to strut-studs with clip angles and 3/8" Type S Screws space twelve (12) inches o.c.
- D. Wallboard Installation - Double Layer Installation: Erect gypsum wallboard base layer vertically or horizontally to meet fire rating on one side of studs with end joints staggered. Fasten base layer panels to studs with one (1) inch Type S screws twenty-four (24) inches o.c. Caulk perimeter of base layer panels. Apply gypsum wallboard face layer vertically over base layer with joints staggered and attached with 1-5/8" Type S screws staggered from those in base, spaced eight (8) inches o.c. and driven into studs.
- E. Wallboard Installation (Where Both Sides of Shaft Wall are Finished): Apply gypsum wallboard face layers vertically both sides of studs. Stagger joints on opposite partition sides. Fasten panels with one (1) inch or two (2) inches Type S screws spaced eight (8) inches o.c. in field and along edges into studs.
- F. Where handrails are indicated for direct attachment to drywall shaft system, provide not less than a sixteen (16) ga. x eight (8) inches wide galvanized steel reinforcement strip, accurately positioned and secured to studs and concealed behind not less than one

1/2" thick course of gypsum board in the system.

- G. Integrate stair hanger rods with drywall shaft system by locating cavity of system as required to enclose rods.

3.7 ERECTION AT COLUMN ENCLOSURES

- A. Metal furring supports shall be provided under work of this Section, and shall be cut to lengths as necessary for tight fit such that spacing is not more than sixteen (16) inches o.c.
- B. Board shall be fastened securely to supports with screws as specified. Place boards in position with minimum number of joints. Where free ends occur between supports, back-blocking or furring shall be required. Center abutting ends over supports. Correct work as necessary so that faces of boards are flush, smooth and true. Provide clips or cross furring for attachment as required.
- C. All layers shall be screw attached to furring.
- D. When column finish called for on drawings to be in the same plane as drywall finish layer, maintain even, level plane.

3.8 FINISHING

- A. Taping: A thin, uniform layer of compound shall be applied to all joints and angles to be reinforced. Reinforcing tape shall be applied immediately, centered over the joint, seated into the compound. A skim coat shall follow immediately but shall not function as a fill or second coat. Tape shall be properly folded and embedded in all angles to provide a true angle.
- B. Filling: After initial coat of compound has hardened, additional compound shall be applied, filling the board taper flush with the surface. The fill coat shall cover the tape and feather out slightly beyond the tape. On joints with no taper, the fill coat shall cover the tape and feather out at least four (4) inches on either side of the tape. No fill coat is necessary on interior angles.
- C. After compound has hardened, a finishing coat of compound shall be spread evenly over and extending slightly beyond the fill coat on all joints and feathered to a smooth, uniform finish. Over tapered edges, the finished joint shall not protrude beyond the plane of the surface. All taped angles shall receive a finish coat to cover the tape and taping compound and provide a true angle. Where necessary, sanding shall be done between coats and following the final application of compound to provide a smooth surface, ready for painting.
- D. Fastener Depressions: Compound shall be applied to all fastener depressions followed, when hardened by at least two (2) coats of compound, leaving all depressions level with the plane of the surface.

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- E. Finishing Beads and Trim: Compound shall be applied to all bead and trim and shall be feathered out from the ground to the plane of the surface. When hardened, this shall be followed by two (2) coats of compound each extending slightly beyond the previous coat. The finish coat shall be feathered from the ground to the plane of the surface and sanded as necessary to provide a flat, smooth surface ready for decoration.
- F. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840.
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are a substrate for tile, and where indicated.
 - 3. Level 4: Level of finish for surfaces exposed to view shall conform to Level 4 of ASTM C 840 and GA-214 of the Gypsum Association.
- G. Drywall construction with defects of such character which will mar appearance of finished work, or which is otherwise defective, will be rejected and shall be removed and replaced at no expense to the Owner.

3.9 CLEANING AND ADJUSTMENT

- A. At the completion of installation of the work, all rubbish shall be removed from the building leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building.
- B. Work shall be left in clean condition ready for painting or wall covering. All work shall be as approved by Architect.
- C. Cutting and Repairing: Include all cutting, fitting and repairing of the work included herein in connection with all mechanical trades and all other trades which come in conjunction with any part of the work and leave all work complete and perfect after all trades have completed their work.

3.10 PROTECTION OF WORK

- A. Installer shall advise Contractor of required procedures for protecting drywall work from damage and deterioration during remainder of construction period.

END OF SECTION

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SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the acoustical panel ceilings as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Acoustical panel units.
 - 2. Exposed "T" suspension system, including hangers and inserts.
 - 3. Provisions for the installation of lighting fixtures, diffusers, grilles and similar items provided under other Sections.
 - 4. Cutting, drilling, scribing and fitting as required for electro-mechanical penetrations.
 - 5. Perimeter and column moldings, trim and accessories for acoustical ceilings.

1.3 RELATED SECTIONS

1.4 QUALITY ASSURANCE

- A. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with all pertinent recommendations published by the Ceilings and Interior Systems Contractor's Association.
- B. Qualifications of Installers
 - 1. The suspended ceiling subcontractor shall have a record of successful installation of similar ceilings acceptable to Architect and shall be currently approved by the manufacturer of the ceiling suspension system.
 - 2. For the actual fabrication and installation of all components of the system, use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.
- C. The work is subject to the following standards:

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1. ASTM C 635 "Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings," American Society for Testing and Materials.
 2. ASTM C 636 "Standard Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels," American Society for Testing and Materials.
- D. In addition to suspension system specified, provide seismic struts and seismic clips to meet seismic standards as required by prevailing Codes and Ordinances.

1.5 SUBMITTALS

- A. Shop Drawings: Submit completely dimensioned ceiling layouts for all areas where acoustical ceilings are required, showing:
1. Any deviations from Architect's reflected ceiling plan layouts, especially lighting fixture and dimensions. Also indicate if any light fixtures will not fit into Architect's ceiling layout due to dimensional restrictions or field conditions.
 2. Direction and spacing of suspension members and location of hangers for carrying suspension members.
 3. Direction, sizes and types of acoustical units, showing suspension grid members, and starting point for each individual ceiling area.
 4. Moldings at perimeter of ceiling, at columns and elsewhere as required due to penetrations or exposure at edge of ceiling tiles.
 5. Location and direction of lights, air diffusers, air slots, and similar items in the ceiling plane.
 6. Details of construction and installation at all conditions.
 7. Materials, gauges, thickness and finishes.
- B. Samples and Product Literature: Submit the following samples and related manufacturer's descriptive literature.
1. Twelve (12) inch long components of suspension systems, including moldings.
 2. Acoustical units — full size.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.

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- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

1.7 PROJECT CONDITIONS

- A. Do not install acoustical ceilings until wet-work in space is completed and nominally dry, work above ceilings has been completed, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

1.8 COORDINATION

- A. Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, fire suppression system components, and partition system.

1.9 EXTRA STOCK

- A. Extra Stock: Deliver stock of maintenance material to Owner. Furnish maintenance material matching products installed, packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 2.0% of amount installed.

PART 2 PRODUCTS

2.1 ACOUSTICAL UNITS

- A. Armstrong Ultima square lay-in tile with 15/16" Prelude grid or approved equal.

2.2 SUSPENSION SYSTEM

- A. The suspension system shall support the ceiling assembly shown on the drawings and specified herein, with a maximum deflection of 1/360 of the span, in accordance with ASTM C 635.
- B. Provide min. 12 ga. galvanized wire hangers, soft annealed steel conforming to ASTM A 641, prestretched, Class 1 zinc coating, soft temper, size so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire.
- C. Provide ceiling clips and inserts to receive hangers, type as recommended by suspension system manufacturer, sizes for pull-out resistance of not less than five (5)

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times the hanger design load, as indicated in ASTM C 635.

- D. Suspension systems shall conform to ASTM C 635, intermediate duty.
- E. Provide manufacturer's standard wall moldings with off-white baked enamel finish to match suspension systems. For circular penetrations of ceilings, provide edge moldings fabricated to diameter required to fit penetration exactly.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas where acoustical panel ceilings are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected to permit proper installation of the layout.

3.2 PREPARATION

- A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.
- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans.

3.3 INSTALLATION

- A. Codes and Standards: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations and industry standards.
- B. Install suspension systems to comply with ASTM C 636, with wire hangers supported only from building structural members. Locate hangers not more than 6" from each end and spaced 4'-0" along direct-hung runner, leveling to tolerance of 1/8" in 12'-0".
- C. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.
- D. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, reinforcing, countersplaying or other equally effective means.
- E. Install edge moldings at edges of each acoustical ceiling area, and at locations where edge of acoustical units would otherwise be exposed after completion of the work.
 - 1. Secure moldings to building construction by fastening through vertical leg. Space

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holes not more than 3" from each end and not more than sixteen (16) inches o.c. between end holes. Fasten tight against vertical surfaces.

2. Level moldings with ceiling suspension system, to a level tolerance of 1/8" in 12'-0".

- F. Install acoustical units in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
- G. Install hold-down clips in toilet areas, and in areas where required by governing regulations; space 2'-0" o.c. on all cross tees.
- H. Light fixtures or other ceiling apparatus shall not be supported from main beams or cross tees if their weight causes the total load to exceed the deflection capability of the ceiling suspension system. In such cases the load shall be supported by supplemental hangers furnished and installed by this Section of work.
- I. Where fixture or ceiling apparatus installation causes eccentric loading on runners, provide stabilizer bars to prevent rotation.

3.4 ADJUST AND CLEAN

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge molding, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

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SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the resilient accessories, as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Rubber base.
 - 2. Accessories.

1.3 RELATED SECTIONS

- A. Gypsum Drywall - Section 09 29 00.
- B. Resilient Tile Flooring - Section 09 65 19.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.

1.5 SUBMITTALS

- A. Manufacturer's Data: For information only, submit manufacturer's technical information and installation instructions for type of resilient base.
- B. Samples
 - 1. Submit six (6) inch long samples of base.
 - 2. Submit full-size sample of stair tread.

1.6 DELIVERY AND STORAGE

- A. Deliver materials to the project site in the manufacturer's original unopened containers, clearly marked to indicate pattern, gauge, lot number and sequence of materials.

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- B. Carefully handle all materials and store in original containers at not less than seventy (70) degrees F. for at least forty-eight (48) hours before start of installation.

1.7 JOB CONDITIONS

- A. Continuously heat spaces to receive base to a temperature of seventy (70) degrees F. for at least forty-eight (48) hours prior to installation, whenever project conditions are such that heating is required. Maintain seventy (70) degrees F. temperature continuously during and after installation as recommended by the manufacturer, but for not less than forty-eight (48) hours. Maintain a temperature of not less than fifty-five (55) degrees F. in areas where work is completed.

PART 2 PRODUCTS

2.1 RUBBER BASE

- A. Provide 4" and 6" high by 1/8" thick, continuous rubber top set cove base, coiled lengths only. Base shall conform to ASTM F 1861, Type TP (Rubber, Thermoplastic), Group 1 (solid); provide "Color-Integrated Wall Base" as manufactured by Armstrong Flooring Inc. or equivalent of Roppe, Burke Mercer, Marley Flexco, or Johnsonite.
 - 1. Color: Armstrong Color-Integrated Wall Base TBD.
- B. Rubber base shall comply with Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648.

2.2 ACCESSORIES

- A. Adhesives: Waterproof, stabilized type, as recommended by the manufacturer for the type of service indicated.
- B. Concrete Slab Primer: Non-staining type recommended by the tile manufacturer.
- C. Leveling Compound: Latex/Portland cement flash patching and leveling compound equal to No. DSP-520 made by H.B. Fuller or No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where resilient base is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

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- A. Bases: In all spaces where base is indicated, install bases tight to walls, partitions, columns, built-in cabinets, etc., without gaps at top or bulges at bottom, with tight joints and flush edges, with molded corner pieces at internal and external corners. Provide end stops adjacent to flush type door frames and where base does not terminate against an adjacent surface. Keep base in full contact with walls until adhesive sets.

3.3 CLEANING AND PROTECTION

- A. Remove any excess adhesive or other surface blemishes from base using neutral type cleaners as recommended by the manufacturer.

END OF SECTION

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SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the resilient tile flooring, as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Solid vinyl tile.
 - 2. Vinyl composition tile.
 - 3. Transition strips.
 - 4. Accessories.

1.3 RELATED SECTIONS

- A. Cast-in-Place Concrete - Section 03 30 00.
- B. Resilient Base and Accessories - Section 09 65 13.

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.
- B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 watts per square centimeter.

1.5 SUBMITTALS

- A. Manufacturer's Data: For information only, submit manufacturer's technical information and installation instructions for type of resilient tile.

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B. Samples

1. Submit full-size sample tiles for each type and color required, representative of the expected range of color and pattern variation. Sample submittals will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
2. Submit six (6) inch long samples of transition strips.

C. Submit manufacturer's warranty as noted herein.

1.6 DELIVERY AND STORAGE

- A. Deliver materials to the project site in the manufacturer's original unopened containers, clearly marked to indicate pattern, gauge, lot number and sequence of materials.
- B. Carefully handle all materials and store in original containers at not less than seventy (70) degrees F. for at least forty-eight (48) hours before start of installation.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F. or more than 95 deg F., in spaces to receive floor tile during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F. or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

1.8 WARRANTY

- A. Provide manufacturers 5-year limited warranty.

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PART 2 PRODUCTS

2.1 VINYL COMPOSITION TILE (VCT)

- A. Armstrong Migrations VCT, 12" x 12" Format or approved equal.

2.2 ACCESSORIES

- A. Adhesives: Waterproof, stabilized type, as recommended by the tile manufacturer for the type of service indicated.
- B. Concrete Slab Primer: Non-staining type recommended by the tile manufacturer.
- C. Leveling Compound: Latex/Portland cement flash patching and leveling compound equal to No. DSP-520 made by H.B. Fuller or No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, or approved equal.
- D. Edging Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bullnose edge, color as selected by the Architect from manufacturer's standards.
- E. Finish for Vinyl Tile
 - 1. Cleaner shall be equal to "Super Shine All" made by Hillyard Chemical Co., or approved equal.
 - 2. Wax shall be equal to "Super Hil-Brite" made by Hillyard Chemical Co., or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where resilient tile flooring is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 CONDITION OF SURFACES

- A. Allowable Variations in Substrate Levels (Floors): $\pm 1/8"$ in 10'-0" distance and 1/4" total maximum variation from levels shown.
- B. Grind or fill concrete substrates as required to comply with allowable variation.

3.3 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure

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adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture- vapor-emission rate of 3 lb. of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum **75** percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.4 INSTALLATION

A. Install tile only after all finishing operations, including painting, have been completed and permanent heating system is operating. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by tile manufacturer.

B. Place tile units with adhesive cement in strict compliance with the manufacturer's recommendations. Butt tile units tightly to vertical surfaces, thresholds, nosings and edgings. Scribe around obstructions and to produce neat joints, laid tight, even and in straight, parallel lines. Extend tile units into toe spaces, door reveals, and into closet and similar openings.

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- C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on the finish tile as marked in the subfloor. Use chalk or other non-permanent marking devices.
- D. Lay tile from center marks established with principal walls, discounting minor off-sets, so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.
- E. Match tiles for color and pattern by using tile from cartons in the same sequence as manufactured and packaged. Cut tile neatly to and around all fixtures. Broken, cracked, chipped or deformed tile is not acceptable.
- F. Tightly cement tile to sub-base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks through tile, or other surface imperfections.
- G. Lay tile with grain in all tile running in the same direction.
- H. Place resilient edge strips tightly butted to tile and secure with adhesive. Provide edging strips at all unprotected edges of tile, unless otherwise shown.

3.5 CLEANING AND PROTECTION

- A. Remove any excess adhesive or other surface blemishes from tile, using neutral type cleaners as recommended by the tile manufacturer. Protect installed flooring from damage by use of heavy Kraft paper or other covering.
- B. Finishing for Vinyl Tile: After completion of the project and just prior to the final inspection of the work, thoroughly clean tile floors and accessories. Apply two (2) coats of wax and buff using materials as specified herein.

END OF SECTION

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SECTION 09 78 00

REINFORCED PLASTIC PANELING SYSTEM

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the reinforced plastic paneling system as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Reinforced plastic paneling system.
 - 2. Moldings.

1.3 RELATED SECTIONS

- A. Gypsum Drywall - Section 09 29 00.

1.4 QUALITY ASSURANCE

- A. Installer: A firm which has at least three years' experience in work of the type required by this section and which is acceptable to the manufacturers of the primary materials.
- B. Source: Provide plastic panels which are the products of one manufacturer. Provide secondary materials, moldings and accessories which are acceptable to the panel manufacturer.
- C. In-Place Samples: Before beginning primary work of this section, provide typical in-place samples of each item and type of work at locations acceptable to the Architect and obtain the Architect's acceptance of visual qualities.
 - 1. Size of Sample: Not less than 32 square feet.
 - 2. Intent of Sample: The intent of the in-place sample is to obtain approval of a typical installation as early as possible so that problems, if any, can be corrected before the problem is repeated.
 - 3. Sample Disposition: Acceptable in-place samples may be incorporated into the finished work. Protect and maintain acceptable in-place samples throughout the work of this section to serve as criteria for acceptance of the work
- D. Burning Characteristics: Provide materials whose surface burning characteristics, when

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tested in compliance with ASTM E 84 are classified as Class A or Class 1.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material used. Provide certifications stating that materials comply with requirements.
- B. Initial Selection Samples: Submit minimum 3" x 3" samples showing complete range of colors, textures, and finishes available for each material used.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from all possible damage. Sequence deliveries to avoid delays, but minimize on-site storage.

PART 2 PRODUCTS

2.1 FIBERGLASS PLASTIC PANEL SYSTEM

- A. Products: Provide "Induro FRP" as manufactured by Marlite, with F560SS stainless steel corner guards (basis of design), or comparable product of Nudo Products, Inc., Crane Composites, Inc. or approved equal.
- B. Panel Characteristics: Provide one of the specified products having the following characteristics:
 - 1. Thickness: Not less than 0.09" thick.
 - 2. Texture: Manufacturer's standard pebble texture.
 - 3. Panel Size: Provide largest sizes available to minimize joints and seams.
 - 4. Colors: Provide panels and matching moldings and rivets as selected by the Architect from the manufacturer's standard colors.
- C. Moldings: Provide vinyl moldings as recommended and approved by the panel manufacturer.
- D. Panel Fasteners: Provide nylon rivets recommended by manufacturer for installing reinforced plastic panels to gypsum drywall and metal stud substrates. Do not use any metal in rivets.
- E. Accessories: Provide all necessary sealants, components and accessories as recommended by panel manufacturer for a complete, sanitary, easy-to-clean installation. Use only sanitary, mold inhibiting USDA approved silicone sealant.

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PART 3 EXECUTION

3.1 INSTALLATION

- A. Pre-Installation Examination Required: The Installer shall examine previous work, related work, and conditions under which this work is to be performed and notify Contractor in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Installer accepts substrates, previous work, and conditions.
- B. Manufacturer's Instructions: Strictly comply with manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this section.
- C. Installation: Mechanically attach panels to substrates indicated using non-metallic rivets at spacing recommended by panel manufacturer. Provide expansion clearance at all panel edges as required by manufacturer, but make sure moldings cover panel edges. Gaps are not permitted.
 - 1. Trim and Molding: Provide moldings at all edges, joints, seams and corners. Provide moldings having the easiest to clean shapes and profiles available.
 - 2. Sealing: Seal all edges, joints, seams, and corners as the work progresses.
- D. Tolerances: The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Documents and shall not be added to allowable tolerances indicated for other work.
 - 1. Allowable Variation from True Plumb, Level, and Line: $\pm 1/8"$ in 20'-0".
 - 2. Allowable Variation from True Plane: $1/8"$ in 10'-0".

3.2 CLEANING AND PROTECTION

- A. Cleaning: Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully cleaned or repaired.
- B. Protection: Provide temporary protection to ensure work is without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.

END OF SECTION

SECTION 09 90 00 PAINTING

AND FINISHING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the painting and finishing as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Prime painting unprimed surfaces to be painted under this Section.
 - 2. Painting all items furnished with a prime coat of paint, including touching up of or repairing of abraded, damaged or rusted prime coats applied by others.
 - 3. Painting all ferrous metal (except stainless steel) exposed to view.
 - 4. Painting interior concrete block exposed to view.
 - 5. Painting gypsum drywall exposed to view.
 - 6. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
 - 7. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
 - 8. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
 - 9. Painting of any surface not specifically mentioned to be painted herein or on drawings, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, shall be included as though specified.

1.3 RELATED SECTIONS

- A. Shop priming is required on some, but not all of the items scheduled to be field painted. Refer to other Sections of work for complete description.

- B. Shop Coat on Machinery and Equipment: Refer to the Sections under which various items of manufactured equipment with factory applied shop prime coats are furnished, including, but not necessarily limited to, the following Sections. All items of equipment furnished with prime coat finish shall be finish painted under this Section.

- 1. Plumbing - Division 22.
- 2. Heating, Ventilation and Air Conditioning - Division 23.

- C. Color Coding of Mechanical Piping and Electrical Conduits – Divisions 22 and 26.

- 1. This Color Coding consists of an adhesive tape system and is in addition to painting of piping and conduits under this Section, as specified above.

1.4 MATERIALS AND EQUIPMENT NOT TO BE PAINTED

- A. Items of equipment furnished with complete factory finish, except for items specified to be given a finish coat under this Section.
- B. Factory-finished toilet partitions.
- C. Factory-finished acoustical tile.
- D. Non-ferrous metals, except for items specified and/or indicated to be painted.
- E. Finished hardware, excepting hardware that is factory primed.
- F. Surfaces not to be painted shall be left completely free of droppings and accidentally applied materials resulting from the work of this Section.

1.5 QUALITY ASSURANCE

- A. Job Mock-Up
 - 1. In addition to the samples specified herein to be submitted for approval, apply in the field, at their final location, each type and color of approved paint materials, applied 10 feet wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the Architect. Paint mock-ups to include door and frame assembly.
 - 2. These applications when approved will establish the quality and workmanship for the work of this Section.
 - 3. Repaint individual areas which are not approved, as determined by the Architect, until approval is received. Assume at least two paint mock-ups of each color and gloss for approval.
- B. Qualification of Painters: Use only qualified journeyman painters for the mixing

and application of paint on exposed surfaces.

- C. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Architect in writing of any anticipated problems using the coating systems as specified with substrates primed by others.
- D. All paints must conform to the Volatile Organic Compounds (VOC) standards of prevailing codes and ordinances.
- E. VOC Limits: Comply with Adhesives, Sealants, and Sealant Primers VOC Limits Tables, CI 2009 (usgbc.org).

1.6 SUBMITTALS

- A. Materials List: Before any paint materials are delivered to the job site, submit to the Architect a complete list of all materials proposed to be furnished and installed under this portion of the work. This shall in no way be construed as permitting substitution of materials for those specified or accepted for this work by the Architect.
- B. Samples
 - 1. Accompanying the materials list, submit to the Architect copies of the full range of colors available in each of the proposed products.
 - 2. Upon direction of the Architect, prepare and deliver to the Architect two (2) identical sets of Samples of each of the selected colors and glosses painted onto 8-1/2" x 11" x 1/4" thick material; whenever possible, the material for Samples shall be the same material as that on which the coating will be applied in the work.
- C. Manufacturer's Recommendations: In each case where material proposed is not the material specified or specifically described as an acceptable alternate in this Section of these specifications, submit for the Architect's review the current recommended method of application published by the manufacturer of the proposed material.
- D. Closeout Submittal
 - 1. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual such as Sherwin Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each

product/color/finish was used, product data pages, MSDS, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.7 PRODUCT HANDLING

- A. Deliver all paint materials to the job site in their original unopened containers with all labels intact and legible at time of use.
- B. Protection
 - 1. Store only the approved materials at the job site, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
 - 2. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.
 - 3. Use all means necessary to protect paint materials before, during and after application and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.8 EXTRA STOCK

- A. Upon completion of this portion of the Work, deliver to the Owner an extra stock of paint equaling approximately ten (10) percent of each color and gloss used and each coating material used, with all such extra stock tightly sealed in clearly labeled containers.

1.9 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds eighty-five (85) percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.

- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

PART 2 PRODUCTS

2.1 PAINT MANUFACTURERS

- A. Except as otherwise noted, provide the painting products listed for all required painting made by one of the following manufacturers: Benjamin Moore, PPG Paint (Glidden Professional), and Sherwin Williams (S-W). Comply with number of coats and required minimum mil thicknesses as specified herein.

2.2 MATERIALS

- A. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer and use only to recommended limits.
- B. Colors and Glosses: All colors and glosses shall be as selected by the Architect. Certain colors will require paint manufacturer to prepare special factory mixes to match colors selected by the Architect. Color schedule (with gloss) shall be furnished by the Architect.
 - 1. Pricing shall be based on the use of 16 base colors plus black and white.
- C. Coloring Pigment: Products of or furnished by the manufacturer of the paint or enamel approved for the work.
- D. Linseed Oil: Raw or boiled, as required, of approved manufacture, per ASTM D 234 and D 260, respectively.
- E. Turpentine: Pure distilled gum spirits of turpentine, per ASTM D 13.
- F. Shellac: Pure gum shellac (white or orange) cut in pure denatured alcohol using not less than four (4) lbs. of gum per gallon of alcohol.
- G. Driers, Putty, Spackling Compound, Patching Plaster, etc.: best quality, of approved manufacture.
- H. Heat-Resistant Paint: Where required, use heat resistant paint when applying paint to heating lines and equipment.

2.3 GENERAL STANDARDS

- A. The various surfaces shall be painted or finished as specified below in Article 2.4. However, the Architect reserves the right to change the finishes within the range of flat, semi-gloss or gloss, without additional cost to the Owner.

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1. Provide the following gloss levels at the following locations:
 - a. Walls: Eggshell
 - b. Trim: Semi-Gloss
 - c. Ceilings: Flat
 2. Note: General paint must match the District's existing color; Benjamin Moore #2133-70 Tundra and accent color Behr Marquee #HDC-AC-23A Cabana Blue. Other colors will also be required.
- B. All paints, varnishes, enamels, lacquers, stains and similar materials must be delivered in the original containers with the seals unbroken and label intact and with the manufacturer's instructions printed thereon.
- C. All painting materials shall bear identifying labels on the containers with the manufacturer's instructions printed thereon.
- D. Paint shall not be badly settled, caked or thickened in the container, shall be readily dispersed with a paddle to a smooth consistency and shall have excellent application properties.
- E. Paint shall arrive on the job color-mixed except for tinting of under-coats and possible thinning.
- F. All thinning and tinting materials shall be as recommended by the manufacturer for the particular material thinned or tinted.
- G. It shall be the responsibility of the Contractor to see that all mixed colors match the color selection made by the Architect prior to application of the coating.

2.4 SCHEDULE OF FINISHES

A. Interior Ferrous Metal

Satin Finish/Latex

Primer: Benj. Moore Ultra Spec HP Acrylic Metal Primer (HP04) PPG Pitt
Tech Plus DTM Acrylic Primer 4020
Sherwin-Williams Pro-Industrial Pro-Cryl Universal Primer B66-

3100 Series

First Coat: Benj. Moore Ultra Spec-HP DTM Acrylic Low Luster (HP25) PPG Pitt Glaze
WB1 Pre-Catalyzed Eggshell Epoxy 16-310 S-W Pro Industrial Acrylic
Eg-Shel, B66-660 Series

Second Coat: Benj. Moore Ultra Spec-HP DTM Acrylic Low Luster (HP25)
PPG Pitt Glaze WB1 Pre-Catalyzed Eggshell Epoxy 16-310 S-W Pro
Industrial Acrylic Eg-Shel, B66-660 Series
a. Total DFT not less than: 3.9 mils

Semi-Gloss Finish/Latex

Primer: Benj. Moore Ultra Spec-HP Acrylic Metal Primer (HP04) PPG
Devflex 4020 PF DTM Primer/Flat Finish

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- 3100 Series Sherwin-Williams Pro-Industrial Pro-Cryl Universal Primer B66-
First Coat: Benj. Moore Ultra Spec HP DTM Acrylic Semi-Gloss (HP29) PPG Pitt
Glaze WB1 Pre-Catalyzed Semi-Gloss Epoxy 16-510 S-W Pro Industrial
Acrylic Semi-Gloss, B66-650 Series
Second Coat: Benj. Moore Ultra Spec HP DTM Acrylic Semi-Gloss (HP29) PPG Pitt Glaze
WB1 Pre-Catalyzed Semi-Gloss Epoxy 16-510 S-W Pro Industrial Acrylic
Semi-Gloss, B66-650 Series
a. Total DFT not less than: 4.0 mils

B. Interior Drywall

- Flat Finish/Vinyl Acrylic Latex
Primer: Benj. Moore Ultra Spec 500 Interior Latex Primer (N534) PPG
Speedhide Zero Interior Latex Primer 6-4900XI
S-W ProMar 200 Zero VOC Interior Latex Primer, B28-2600 First
Coat: Benj. Moore Ultra Spec 500 Latex Flat (N536)
PPG Speedhide Zero Interior Latex Flat 6-4110XI
S-W ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series Second
Coat: Benj. Moore Ultra Spec 500 Latex Flat (N536)
PPG Speedhide Zero Interior Latex Flat 6-4110XI
S-W ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series
a. Total DFT not less than: 3.6 mils

- Eggshell Finish/Vinyl Acrylic Latex
Primer: Benj. Moore Ultra Spec 500 Interior Latex Primer (N534) PPG
Speedhide Zero Interior Latex Primer 6-4900XI
S-W ProMar 200 Zero VOC Interior Latex Primer, B28-2600 First
Coat: Benj. Moore Ultra Spec 500 Interior Latex Eggshell (N538)
PPG Speedhide Zero Interior Latex Eggshell 6-4310XI
S-W ProMar 200 Zero VOC Interior Latex Eg-Shell, B20-1900
Series
Second Coat: Benj. Moore Ultra Spec 500 Interior Latex Eggshell (N538) PPG
Speedhide Zero Interior Latex Eggshell 6-4310XI
S-W ProMar 200 Zero VOC Interior Latex Eg-Shell B20-1900
Series
a. Total DFT not less than: 3.8 mils

2.5 PIPING AND MECHANICAL EQUIPMENT EXPOSED TO VIEW

- A. Paint all exposed piping, conduits, ductwork and mechanical and electrical equipment. Use heat resisting paint when applied to heating lines and equipment. The Contractor is cautioned not to paint or otherwise disturb moving parts in the mechanical systems. Mask or otherwise protect all parts as required to prevent damage.
- B. Exposed Uncovered Ductwork, Piping, Hangers and Equipment: Latex Enamel Undercoater and one (1) coat Acrylic Latex Flat.

- C. Exposed Covered Piping, Duct Work and Equipment: Primer/Sealer and one (1) coat Acrylic Latex Flat.
- D. Panel Boards, Grilles and Exposed Surfaces of Electrical Equipment: Latex Enamel Undercoater and two (2) coats Latex Semi-Gloss.
- E. Equipment or Apparatus with Factory-Applied Paint: Refinish any damaged surfaces to match original finish. Do not paint over name plates and labels.
- F. All surfaces of insulation and all other work to be painted shall be wiped or washed clean before any painting is started.
- G. All conduit, boxes, distribution boxes, light and power panels, hangers, clamps, etc., are included where painting is required.
- H. All items of Mechanical and Electrical trades which are furnished painted under their respective Contracts shall be carefully coordinated with the work of this Section so as to leave no doubt as to what items are scheduled to be painted under this Section.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where painting and finishing are to be applied and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 GENERAL WORKMANSHIP REQUIREMENTS

- A. Only skilled mechanics shall be employed. Application may be by brush or roller. Spray application only upon acceptance from the Architect in writing.
- B. The Contractor shall furnish the Architect a schedule showing when he expects to have completed the respective coats of paint for the various areas and surfaces. This schedule shall be kept current as the job progresses.
- C. The Contractor shall protect his work at all times and shall protect all adjacent work and materials by suitable covering or other method during progress of his work. Upon completion of the work, he shall remove all paint and varnish spots from floors, glass and other surfaces. He shall remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and shall leave his part of the work in clean, orderly and acceptable condition.
- D. Remove and protect hardware, accessories, device plates, lighting fixtures, and factory finished work, and similar items, or provide ample in place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.

- E. Remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. All materials shall be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.
- G. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the Owner.
- H. All coats shall be dry to manufacturer's recommendations before applying succeeding coats.
- I. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.

3.3 PREPARATION OF SURFACES

A. General

- 1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning, sanding, and touching-up of all prime coats applied under other Sections of the work. Broom clean all spaces before painting is started. All surfaces to be painted or finished shall be perfectly dry, clean and smooth.
- 2. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
- 3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.

B. Metal Surfaces

- 1. Weld Fluxes: Remove weld fluxes, splatters, and alkali contaminants from metal surfaces in an approved manner and leave surface ready to receive painting.
- 2. Bare Metal: Thoroughly clean off all foreign matter such as grease, rust, scale and dirt before priming coat is applied. Clean surfaces, where solder flux has been used, with benzene. Clean surfaces by flushing with mineral spirits. For aluminum surfaces, wipe down with an oil free solvent prior to application of any pre-treatment.

- a. Bare metal to receive high performance coating specified herein must be blast cleaned SSPC SP-6 prior to application if field applied primer; coordinate with steel trades furnishing ferrous metals to receive this coating to ensure that this cleaning method is followed.
 3. Shop Primed Metal: Clean off foreign matter as specified for "Bare Metal." Prime bare, rusted, abraded and marred surfaces with approved primer after proper cleaning of surfaces. Sandpaper all rough surfaces smooth.
 4. Galvanized Metal: Prepare surface as per the requirements of ASTM D 6386.
 5. Metal Filler: Fill dents, cracks, hollow places, open joints and other irregularities in metal work to be painted with an approved metal filler suitable for the purpose and meeting the requirements of the related Section of work; after setting, sand to a smooth, hard finish, flush with adjoining surface.
 - C. Gypsum Drywall Surfaces: Scrape off all projections and splatters, spackles all holes or depressions, including taped and spackled joints, sand smooth. Conform to standards established in Section 092900, "Gypsum Drywall."
 - D. Wood Surfaces: Sand to remove all roughness, loose edges, splinters, or splinters and then brush to remove dust. Wash off grease or dirt with an approved cleaner. Fill all cracks, splits, nail holes, screw holes, and surface defects with putty after the priming coat has been applied. Putty shall be brought up flush with the surface and sanded smooth and touched-up with primer when dry.
 - E. Block Masonry Surfaces: Thoroughly clean off all grit, grease, dirt mortar drippings or splatters, and other foreign matter. Remove nibs or projections from masonry surfaces. Fill cracks, holes or voids not filled under the "Masonry" Section, with Portland cement grout, and bag surface so that it has approximately the same texture as the adjacent masonry surface.
 - F. Testing for Moisture Content: Contractor shall test all masonry and drywall surfaces for moisture content using a reliable electronic moisture meter. Contractor shall also test latex type fillers for moisture content before application of topcoats of paint. Do not apply any paint or sealer to any surface or to latex type filler where the moisture content exceeds seven (7) percent as measured by the electronic moisture meter.
 - G. Touch-Up: Prime paint all patched portions in addition to all other specified coats.
- 3.4 MATERIALS PREPARATION
- A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.

- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.
- D. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are to be applied. Tint undercoats to match the color of the finish coat; provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

- A. General: Apply paint by brush or roller in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required.
 - 1. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.
 - 2. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to ensure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
 - 3. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - a. "Exposed surfaces" is defined as those areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, etc., are in place in areas scheduled to be painted.
 - 4. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint, before final installation of equipment.
 - 5. Paint the back sides of access panels, removable or hinged covers to match the exposed surfaces.
 - 6. Finish doors on tops, bottoms, and side edges the same as the faces, unless otherwise indicated.

7. Enamel finish applied to wood or metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface.
8. Paste wood filler applied on open grained wood after beginning to flatten, shall be wiped across the grain of the wood, then with a circular motion, to secure a smooth, filled, clean surface with filler remaining in open grain only. After overnight dry, sand surface with the grain until smooth before applying specified coat.

B. Scheduling Painting

1. Apply the first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 2. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Prime Coats: Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage.
- E. Touching-Up of Factory Finishes: Unless otherwise specified or shown, materials with a factory finish shall not be painted at the project site. To touch up, the Contractor shall use the factory finished material manufacturer's recommended paint materials to repair abraded, chipped, or otherwise defective surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by the painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
- B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.7 CLEAN UP

- A. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each workday.

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- B. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

SECTION 10 22 13
WIRE MESH PARTITIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wire mesh partitions for:
 - 1. Storage compartments.
 - 2. Mezzanine railings.
 - 3. Industrial barriers.
 - 4. Security partitions

1.2 RELATED SECTIONS

- A. Section 099000 – Painting and finishing

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's printed data on products to be furnished.
- C. Shop Drawings: Complete layout and fabrication drawings.
 - 1. For mezzanine railings include evidence that structural design and anchorage meet the requirements of the authorities having jurisdiction.
- D. Samples: Finish color samples for selection.
- E. Keys: Turn over keys for door locks to Owner at completion of project.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: WireCrafters, LLC; 6208 Strawberry Lane, Louisville, KY 40214-2900. ASD. Tel: (800) 626-1816 or (502) 363-6691. Fax: (502) 361-3857. www.wirecrafters.com Email: info@wirecrafters.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 PARTITIONS

- A. Wire Mesh Partitions: Factory-assembled modular sized panels stacked between post uprights, complete with all components, accessories, hardware, and fasteners; interchangeable units that allow expansion without waste of components.
 - 1. Style: Full mesh.
 - 2. Post Spacing: As required to suit dimensions, using manufacturer's standard panel widths.
 - 3. Provide adjustable width sheet metal panels to achieve horizontal partition dimensions indicated up to 40 foot (12.19 m) high partition.
 - 4. Provide special panels of same construction as adjacent panels to achieve horizontal partition dimensions indicated.
 - 5. Panel frames bolted together and to posts.
 - 6. Height: To Be Determined in the field
 - 7. Toe Space - Storage Compartments: 3-1/4 inch (82 mm) high open space below bottom panel.
 - 8. Finish: Electrostatic sprayed enamel, in manufacturer's standard color.
- B. Posts: Square 2 by 2 inch (50 by 50 mm) 14-gauge steel tube.
 - 1. Factory drilled holes for attaching panels.
 - 2. Welded-on base plate, 2 by 7 by 1/4 inch (50 by 178 by 6 mm), with factory drilled holes for floor anchors.
 - 3. Decorative plastic post cap.
 - 4. Corner Posts: Same as in-line posts.
 - 5. Provide appropriate hardware for attaching panels to posts and posts to floor.
- C. Wire Mesh Panels: Steel angle frames with wire mesh securely welded in place; frame joints coped at corner and securely welded; factory drilled holes for fasteners.
 - 1. Wire Mesh: 10 gauge, 0.135 inch (3.5 mm) steel wire woven into 2 by 1 inch (50 by 25 mm) rectangular mesh.
 - 2. Frame: 1-1/4 by 1-1/4 by 1/8 inch (32 by 32 by 3 mm) hot rolled steel angle.
 - 3. Vertical Panel Stiffeners: 1/4 by 3/4 inch (6 by 19 mm) steel bar securely welded to frame behind mesh on panels 4 feet (1219 mm) or wider.
 - 4. Ceiling Panels: Same as wall panels; provide supplemental support where required by span.
- D. Solid Wainscot Panels: 16 gauge steel sheet welded in same mesh panel frames.
- E. Door Sections: Matching wire mesh panels.
 - 1. Frame: 1-1/4 by 1-1/4 by 1/8 inch (32 by 32 by 3 mm) hot rolled steel angle.
 - 2. Stiffeners: Two horizontal and one vertical stiffener of 1/4 by 3/4 inch (6 by 19 mm) flat hot rolled steel bar.
 - 3. Hinged Doors:
 - a. Single Door Width: 48 inches (1220 mm).
 - 4. Locking: Storage function lockset

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PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install plumb, level, and securely anchored to floor and to other structural members where indicated.
- C. Adjust doors and service windows for smooth, easy operation.

END OF SECTION

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TOILET ACCESSORIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the toilet accessories as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Mirrors.
 - 2. Grab bars.
 - 3. Wall mounted paper towel/trash receptacle.

1.3 RELATED SECTIONS

- A. Unit Masonry - Section 04 20 00.
- B. Gypsum Drywall - Section 09 29 00.

1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units. Accessories shall be installed at heights in compliance with prevailing Handicapped Code.
- C. Products: Unless otherwise noted, provide products of same manufacturer for each type of unit and for units exposed in same areas.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, catalog cuts and installation instructions for each toilet accessory.
- B. Setting Drawings: Provide setting drawings, templates, instructions, and directions for

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installation of anchorage devices in other work

- C. Submit schedule of accessories indicating quantity and location of each item.

1.6 PRODUCT HANDLING

- A. Deliver accessories to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type or material, manufacturer's name and brand name. Delivered materials shall be identical to approved samples.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge minimum, unless otherwise indicated.
- B. Brass: ASTM B 19 flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Galvanized Steel Sheet: ASTM A 653, G60.
- D. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- E. Mirrors: ASTM C 1503, mirror glazing quality, clear glass mirrors, nominal 1/4" thick.

2.2 FASTENING DEVICES

- A. Exposed Fasteners: Theft-proof type, chrome plated, or stainless steel; match finishes on which they are being used.
- B. Concealed Fasteners: Galvanized (ASTM A 123) or cadmium plated.
- C. No exposed fastening devices permitted on exposed frames.
- D. For metal stud drywall partitions, provide ten (10) gauge galvanized sheet concealed anchor plates for securing surface mounted accessories.

2.3 FABRICATION

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted. Unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.
- B. Surface-Mounted Toilet Accessories, General: Fabricate units with tight seams and

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joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage.

- C. Recessed Toilet Accessories, General: Fabricate units of all welded construction, without mitered corners. Hang doors of access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where toilet accessories are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PREPARATION

- A. Accessories that are to be partition mounted shall be closely coordinated with other trades, so that the necessary reinforcing is provided to receive the accessories.
- B. Contractor shall coordinate blocking as required for Owner supplied toilet paper dispenser, paper towel dispensers and soap dispensers. Paper towel dispensers are located in Art/Maker space/ Nurse/ Mothers room only. All toilet rooms will have hand dryers only (and no paper towel dispensers).
- C. Furnish templates and setting drawings and anchor plates required for the proper installation of the accessories at gypsum drywall and masonry partitions. Coordinate the work to assure that base plates and anchoring frames are in the proper position to secure the accessories.
- D. Verify by measurements taken at the job site those dimensions affecting the work. Bring field dimensions that are at variance with those on the approved shop drawings to the attention of the Architect. Obtain decision regarding corrective measures before the start of fabrication of items affected.
- E. Cooperate in the coordination and scheduling of the work of this Section with the work of other Sections so as not to delay job progress.

3.3 INSTALLATION

- A. Install accessories at locations indicated on the drawings, using skilled mechanics, in a plumb, level and secure manner.
- B. Concealed anchor assemblies for gypsum drywall partitions shall be securely anchored to metal studs to accommodate accessories. Assemblies shall consist of plates and/or angles tack welded to studs.

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- C. Secure accessories in place, at their designated locations by means of theft-proof concealed set screws, so as to render removing of the accessory with a screwdriver impossible.
- D. Unless otherwise indicated, accessories shall conform to heights from the finished floor as shown on the drawings. Where locations are not indicated, such locations shall be as directed by the Architect.
- E. Installed accessories shall operate quietly and smoothly for use intended. Doors and operating hardware shall function without binding or unnecessary friction. Dispenser type accessories shall be keyed alike. Prior to final acceptance, master key and one duplicate key shall be given to Owner's authorized agent.
- F. The Architect shall be the sole judge of workmanship. Workmanship shall be of the highest quality. Open joints, weld marks, poor connections, etc., will not be permitted. The Architect has the right to reject any accessory if he feels the workmanship is below the standards of this project.
- G. Grab bars shall be installed so that they can support a three hundred (300) lb. load for five minutes per ASTM F 446.

3.4 CLEANING AND PROTECTION

- A. Upon completion of the installation, clean accessories of dirt, paint and foreign matter.
- B. During the installation of accessories and until finally installed and accepted, protect accessories with gummed canvas or other means in order to maintain the accessories in acceptable condition.
- C. Replace and/or repair, to the Owner's satisfaction, and at no additional cost to the Owner, installed work that is damaged or defective.

END OF SECTION

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SECTION 10 44 16 FIRE EXTINGUISHERS AND CABINETS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the fire extinguishers and cabinets as shown on the drawings and/or specified herein.

1.3 RELATED SECTIONS

- A. Gypsum Drywall - Section 092900.
- B. Fire suppression systems - Division 21.
- C. Fire hose cabinets and valve cabinets - Division 21.

1.4 QUALITY ASSURANCE

- A. Provide portable fire extinguishers, cabinets and accessories by one manufacturer.
- B. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required. For fire extinguisher cabinets include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Where color selections by Architect are required, include color charts showing full range of manufacturer's standard colors and designs available.
- B. Samples: Submit samples, 6" square, of each required finish. Prepare samples on metal of same gauge as metal to be used in the work. Where normal color variations are to be expected, include 2 or more units in each sample showing the limits of such variations.

PART 2 PRODUCTS

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2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following:
 - 1. JL Industries.
 - 2. Larsen's Mfg. Co.
 - 3. Potter Roemer.

2.2 EXTINGUISHERS

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard which comply with requirements of governing authorities.
- B. Abbreviations indicated below to identify extinguisher type related to UL classification and rating system and not necessarily to type and amount of extinguishing material contained in extinguisher.
- C. Multi-Purpose Dry Chemical Type: UL rated 2-A:10-B:C, 5 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires.

2.3 MOUNTING BRACKETS

- A. Provide manufacturer's standard bracket designed to prevent accidental dislodgment of extinguisher, of proper size for type and capacity of extinguisher specified, in manufacturer's standard enamel finish; color to match extinguisher.

2.4 CABINETS

- A. Type and Style: Fire extinguisher cabinets shall be metal, recessed, with plexiglass panel, sized to fit within the partition or wall depth. Provide fire rated cabinets within fire rated partitions.
- B. Color: Fire extinguisher cabinets shall be factory pre-finished with baked enamel in the colors selected by the Architect from the standard range of colors of the selected manufacturer.
- C. Design is based on "Model G-2409-R1" of Larsen's Mfg. Co. Other manufacturers noted herein may substitute their equivalent cabinet upon acceptance by the Architect.

2.5 IDENTIFICATION

- A. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk-screen process. Provide lettering on door as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.
- B. Identify bracket-mounted extinguishers with red letter decals spelling 'FIRE

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EXTINGUISHER' applied to wall surface. Letter size, style and location as selected by the Architect.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where fire extinguishers and cabinets are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install items included in this Section in locations indicated and at heights to comply with applicable regulations of governing authorities.
 - 1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 - 2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
- B. Where exact location of cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by the Architect.

3.3 SERVICE

- A. Determine the approximate completion date of the work and then inspect, charge, and tag the fire extinguishers at a date not more than 10 days before or not less than one day before actual completion date of the work.

END OF SECTION

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SECTION 22 03 00

PLUMBING FIXTURES AND EQUIPMENT

PART 1 – GENERAL

Applicable Provisions of the Conditions of the Contract and Division 1 General Requirements govern the work in this section. Submit shop drawings for checking and approval.

1.1 DESCRIPTION OF WORK

- A. The work under this section shall consist of furnishing all labor, materials, equipment and appliances necessary and required to completely do all plumbing fixture work, as required by the Drawings and as specified herein, including but not limited to the following: plumbing fixtures, traps, fittings, trimmings, brackets, plates, anchor, chair carriers and supports.
- B. Just before the Owner's taking over the work in the building, this Contractor shall thoroughly clean all fixtures furnished and set under this Contract, leaving every fixture in perfect condition and ready for use.
- C. Submit shop drawings and roughing sheets for all equipment for checking and approval.

PART 2 - PRODUCTS

2.1 PLUMBING FIXTURES AND EQUIPMENT

- A. All fixtures shall be free from imperfections, true as to line angles, curves and color, smooth, watertight, complete in every respect and practically noiseless in operation, Fixtures specified are given as the typical standard required as manufactured by American Standard and they or other similar approved fixtures as made by Kohler of Eljer Companies shall be furnished, set and connected in good substantial, neat workmanlike manner.
- B. The letter designations hereinafter correspond with the schedule on the Drawings.
 - 1. Water Closet
 - 2. Flush valve type, wall mounted 2257.103 "Afwall" vitreous china, siphon jet action, elongated bowl, 1-1/2" top spud, Sloan Royal 115-1.6 or Zurn Z6000AV-2-WS1 low consumption flush valve, Olsonite #95 open front seat cover. Provide floor mounted carrier equal to Zurn Z1203 series or Z1204 series.
 - 3. Water Closet - (Handicapped) Same as above except Handicapped.
 - 4. Lavatory - Type B1 (Handicapped)
 - 5. 0356.015 "Lucerne" white vitreous china lavatory with 8" centers, concealed arm

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support, 7723.018 offset grid drain, adjustable trap, loose key stops and all required trim. Chicago Faucet model 404-V665-E12 self-closing adjustable palm button faucet with vandal-proof aerator. Mount lavatory 34" above finished floor. Cover "P" trap and supplies and stops with Truebro "Handi-Lav-Guard" insulation kits.

6. Floor Drains: Josam series 30000A or Zurn Z415 type "B" coated cast iron, two piece body with double drainage flange, flashing collar, weepholes, bottom outlet and adjustable strainer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All fixtures shown on Drawings shall be set, connected and tested by the Contractor. He shall also make all water; soil, waste, vent and other service connections to fixtures as shown on Drawings or as directed and shall set, furnish, connect and test all necessary fittings.
- B. All pipes at fixtures passing into walls, floors or partitions shall be provided with heavy cast brass escutcheons and security (tamperproof) set screws finished to match the pipe. No "waiving" of this section will be permitted.
- C. All fittings escutcheons, faucets, traps, exposed piping etc. shall be brass, chrome plated over nickel plate with polished finish. Any visible hanger nuts shall be security (tamperproof) type and shall likewise be chrome plated over nickel plate.
- D. This Contractor shall be responsible for protecting all plumbing fixtures including in these Specifications against injury from the building materials, tools and equipment. Any fixtures damaged during the construction period shall be replaced new. After all fixtures are set, this Contractor shall carefully grout all around fixtures.

End of Section

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SECTION 31 10 00

SITE CLEARING PART 1-GENERAL

1.1 RELATED DOCUMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section Includes all labor, materials, equipment, and services necessary to complete the unit masonry work as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing, and removing site utilities or abandoning site utilities in place.
 - 7. Temporary erosion and sedimentation control measures.

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on

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Drawings.

- E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain on the Site, cleared materials shall become Contractor's property and shall be removed from the Site.

1.5 SUBMITTALS

- A. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations per applicable Highway Permits, Division 01 General Requirements, and Drawings.
- B. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- C. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- D. Do not direct vehicle or equipment exhaust towards protection zones.
- E. Prohibit heat sources, flames, ignition sources, and smoking within or near

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protection zones.

- F. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2-PRODUCTS

2.0 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3-EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag each tree trunk at 54 inches (1372 mm) above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide in accordance with Drawings and Section 01 50 00 Temporary Facilities and Controls.

3.3 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site according to Drawings.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Landscape Architect.

3.4 EXISTING UTILITIES

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- A. Contractor (with consent of owner) shall arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- E. Excavate for and remove underground utilities indicated to be removed.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and/or remove stumps, roots, obstructions, and debris to a depth of 24 inches below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

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- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Top soil material shall be screened to be 1" minus and stockpiled onsite. Topsoil shall be in accordance with Section 2.2 of Turfs and Grasses Section 32 92 00
- D. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches, unless otherwise authorized by Engineer.
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off the Site.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 10 00

SECTION 31 20 00
EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, Division 01 General Requirements and Section 01 50 00 Temporary Facilities and Controls apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Preparing subgrades for curbs, walks, pavements, lawns, and plantings.
 - 2. Excavating and backfilling for stormwater practices and utility structures.
 - 3. Subbase course for concrete walks and pavements.
 - 4. Excavating and backfilling trenches for buried utilities and pits for buried utility structures.
 - 5. Excavation for mass grading of site.

1.3 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer.
 - 2. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 30 feet (9 m) in either length or width.
 - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

- E. Fill: Soil materials used to raise existing grades.
- F. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. (0.76 cu. m) in place that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted.
 - 1. Excavation of Trenches and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, short-tip-radius rock bucket; rated at not less than 120-hp (89-kW) flywheel power with bucket-curling force of not less than 25,000 lbf (111 kN) and stick-crowd force of not less than 18,700 lbf (83 kN); measured according to SAE J-1179.
 - 2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp (157- kW) flywheel power and developing a minimum of 45,000-lbf (200-kN) breakout force; measured according to SAE J-732.
- G. Structures: Slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subbase Course: Layer placed between the subgrade and asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.
- I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- J. Utilities: include on-site underground pipes, conduits, ducts, and cables, as well as underground services within 5 feet of the building.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of detectable warning tape.
 - 2. Drainage fabric.
 - 3. Separation fabric.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
 - 2. Analytical results demonstrating imported soil meets constituent concentration requirements for "Unrestricted Use" as defined by NYSDEC Part 375 and DER-10 technical guidance documents unless another use category and alternate

constituent concentrations are approved by Engineer.

- C. Blasting plan approved by authorities having jurisdiction, for record purposes.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Engineer's written permission.
 3. Contact utility-locator service for area where Project is located before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be re- moved. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not avail- able from excavations.
- B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Backfill and Fill: Satisfactory soil materials.
- E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of NYSDOT Item # 304.12.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent

passing a 1-1/2-inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

- G. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- H. Crushed Stone: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; meeting the requirements of NYSDOT Item # 623.12 and gradation requirements of NYSDOT Item # 605.0901.
- I. Rip Rap: Medium stone fill of crushed or uncrushed rock meeting the requirements of NYSDOT Item # 620.04, unless otherwise specified on the Drawings.

2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
 - 1. Red: Electric
 - 2. Yellow: Gas, oil, steam, and dangerous materials
 - 3. Orange: Telephone and other communications
 - 4. Blue: Water systems
 - 5. Green: Sewer systems
- B. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
 - 1. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632
 - 2. Tear Strength: 40 lbf (178 N); ASTM D 4533
 - 3. Puncture Resistance: 50 lbf (222 N); ASTM D 4833
 - 4. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491
 - 5. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751
- C. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

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Construction Documents
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

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1. Grab Tensile Strength: 200 lbf (890 N); ASTM D 4632.
2. Tear Strength: 75 lbf (333 N); ASTM D 4533.
3. Puncture Resistance: 90 lbf (400 N); ASTM D 4833.
4. Water Flow Rate: 4 gpm per sq. ft. (2.7 L/s per sq. m); ASTM D4491.
5. Apparent Opening Size: No. 30 (0.6 mm); ASTM D 4751.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and waterways.

3.2 DEWATERING

- A. Provide in accordance with Section 01 50 00 Temporary Facilities and Controls.

3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of sur- face and subsurface conditions encountered, including rock, soil materials, and obstructions.
 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavations for Equipment Pads: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility

Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended for bearing surface.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: As indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 - 3. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 APPROVAL OF SUBGRADE

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and

areas of excess yielding. Do not proof roll wet or saturated subgrades.

- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

3.8 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Engineer.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.9 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 - 2. Soil material shall be screened to be 3" minus and stockpiled on site. Soil material shall be in accordance with section 2.1 of Earth Moving 31 20 00.
 - 3. Topsoil material shall be screened to be 1" minus and stockpiled on site. Topsoil shall be in accordance with Section 2.2 of Turfs and Grasses Section 32 92 00.

3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for record documents.
 - 3. Inspecting and testing underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.11 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape

bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

- B. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings; fill with concrete to elevation of bottom of footings.
- C. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- D. Coordinate backfilling with utilities testing.
- E. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- F. Place and compact final backfill of satisfactory soil material to final subgrade.
- G. Install warning tape directly above utilities, 18 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.12 FILL

- A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal, so fill material will bond with existing material.
- C. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.

3.13 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact

to specified dry unit weight.

3.14 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under utility structures and paved shoulders, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.
 - 2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 92 percent.
 - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below sub-grade and compact each layer of backfill or fill material at 90 percent.
 - 4. Under NYSDOT travel lanes and within 1 on 1 slope of travel lanes backfill trench with select granular fill meeting NYSDOT Item #623.12 or #605.0901.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
 - 2. Walks: Plus or minus 1 inch (25 mm).
 - 3. Pavements: Plus or minus 1/2 inch (13 mm).

3.16 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place subbase course on prepared subgrade and as follows:

1. Place base course material over subbase.
 2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
 3. Shape subbase and base to required crown elevations and cross-slope grades.
 4. When thickness of compacted subbase or base course is 6 inches (150 mm) or less, place materials in a single layer.
 5. When thickness of compacted subbase or base course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.
- B. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.17 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area, but in no case fewer than three tests.
 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

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Construction Documents
SED NO: 48-05-03-04-0-001-013
SED NO: 48-05-03-04-0-007-002
SED NO: 48-05-03-04-0-010-006
SED NO: 48-05-03-04-5-012-003

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- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, back- fill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Transport surplus satisfactory soil offsite.
 - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dis- pose of it offsite.

END OF SECTION 31 20 00

SECTION 321313
CONCRETE PAVING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Preparation for concrete paving
- B. Placement of fabric reinforcement
- C. Placement of concrete
- D. Placement of joints and sealants
- E. Placement of detectable warning surface
- F. Finishing and curing

1.02 RELATED SECTIONS

1.03 SUBMITTALS

- A. Comply with the requirements of Section 013300 – Submittal Procedures and as modified below.
- B. Product Data
 - 1. Concrete Mix Design: Submit proposed concrete design mix together with the name and location of the batching plant.
 - 2. Portland Cement: Brand and manufacturer's name.
 - 3. Air Entraining Admixture: Brand and manufacturer's name.
 - 4. Water Reducing or High Range Water Reducing Admixture: Brand and manufacturer's name.
 - 5. Curing and Anti-Spalling Compound: Manufacturer's specifications and application instructions.
 - 6. Welded Wire Mesh and Reinforcing Bars and Dowels: Manufacturer's name.
 - 7. Joint Fillers and Sealants: Catalog sheets, specifications and installation instructions for each product specified.
 - 8. ADA Detectable Warning Surface: Manufacturer's specifications, product data, test reports, method of installation, and maintenance instructions.

- C. Closeout Procedures: Comply with the requirements of Section 017700.

1.04 QUALITY ASSURANCE

- A. At location directed by the Architect, construct concrete flatwork sample panel approximately 5' wide by 15' long.
- B. Concrete batching plants shall be currently approved as concrete suppliers by the New York State Department of Transportation.

C. Regulatory Requirements

1. Conform to the requirements of local regulatory agencies, or if applicable, the New York State Department of Transportation, whichever is more stringent for methods and materials in work areas subject to applicable agency's review and approval. Provide materials complying with referenced New York State Department of Transportation Standard Specifications where indicated.
2. Obtain written permission from applicable agencies prior to the start of construction.

1.05 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activity. Provide barricades, warning signals, warning lights, and similar items as required.
- B. Environmental Conditions
1. Humidity and Moisture: Do not install the work under this specification section under conditions that are detrimental to the installation, curing and performance of the specified materials.
 2. Temperature: Unless otherwise approved or recommended in writing by the sealant manufacturer, do not install sealants below 40 degrees F. or above 85 degrees F.
- C. Protection: Protect all newly poured concrete surfaces from damage. Protect all surfaces adjacent to sealants with non-staining, removable tape or other approved covering to prevent soiling or staining.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cast-In-Place Concrete: Normal weight, air entrained concrete with a minimum compressive strength of 4,500 psi at the end of 28 days.
1. Design Air Content: ASTM C 260, and on the New York State Department of Transportation's current "Approved List"; 6% by volume +/- 1.5%.
 2. Cement: ASTM C 150 Type I or II portland cement. Minimum 6.5 bags or 611 pounds per cubic yard.
 3. Water: Potable.
 4. Slump: Between 2 and 4 inches except when a water reducing admixture is used, the maximum slump shall be 6 inches. When a high range water reducing admixture is used, the maximum slump shall be 8 inches.

5. Water Reducing Admixture: ASTM C 494, Type A and on the current New York State Department of Transportation's current "Approved List".
 6. High Range Water Reducing Admixture: ASTM C 494, Type F and on the current New York State Department of Transportation's current "Approved List".
- B. Chemical Curing and Anti-Spalling Compound: Water based, acrylic polymer, Type 1, Class A (non-yellowing) compound complying with the requirements of ASTM C 1315.
1. For convenience, details and specifications have been based on the following manufacturers and their products:
 - a. Vocimp 25 by W.R. Meadows, Inc., Hampshire IL.
 - b. Super Diamond Clear VOX, Euclide Chemical Co., Inc., Cleveland, OH.
 - c. Cure and Seal 25% J22UV by Dayton Superior, Dayton, OH.
- C. Reinforcement
1. Welded Wire Mesh: Flat sheets of welded, plain, cold drawn steel wire fabric complying with ASTM A 185. Rolled wire will not be acceptable for installation as part of the project.
 2. Reinforcing Bars and Dowels: Deformed steel bars, ASTM A 615, Grade 60.
- D. ADA Detectable Warning Surface: Precast and prefabricated paving units with a non-slip texture on the travel surface. Color shall be a shade of brick red. There shall be a minimum of 70% contrast in light reflectance between the detectable warning surface and the adjoining surfaces. Material used to provide visual warning shall be an integral part of the detectable warning surface. Visual contrast to meet the existing ADAAG A4.2.9.2.
1. For convenience, details and specifications have been based on the following manufacturers and their products:
 - a. ADA Pavers: Whiteacre-Greer, Alliance, OH.
 - b. Detecto-Tile: Mexcon, Worcester, NY
 - c. Detectable Warning Pavers: Oaks Concrete Products, Bartlett, IL.
 - d. Granite Truncated Dome Pavers: Cold Spring, MN.
- E. Joint Sealants
1. For horizontal joints, two-part self-leveling polyurethane sealant for traffic bearing construction.
 - a. For convenience, details and specifications have been based on the following manufacturers and their products:

- (1) Vulkem 255 by Mameco International, Inc., Beachwood, OH.
- (2) Urexpan NR-200 by Pecora Corp, Harleysville, PA.
- (3) Chem-Calk 550 by Bostik Inc., Middleton MA.
- (4) Sealtight Porthane Sealant by W.R. Meadows, Elgin, IL.
- (5) Sonolastic SL-2 Joint Sealant Slope Grade by Sonneborn Building Products Inc., Minneapolis, MN.

2. For vertical joints, two-part non-sag polyurethane sealant.
 - a. For convenience, details and specifications have been based on the following manufacturers and their products:
 - (1) Vulkem 227 by Mameco International, Inc., Beachwood, OH.
 - (2) Dynatrol II by Pecora Corp, Harleysville, PA.
 - (3) Chem-Calk 500 by Bostik Inc., Middleton MA.

F. Joint Fillers

1. Closed Cell Polyurethane Joint Filler: Resilient, compressible, semi-rigid, closed cell isometric polymer foam material, minimum 1/2" thick similar to Ceramar Joint Filler as manufactured by W.R. Meadows, Inc., Elgin IL.
 - a. Fiber board or cork joint filler material is not acceptable for use in concrete expansion joint work.

2.02 EQUIPMENT

- A. Forms: Steel of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Coat forms with non-staining, clear, paraffin-based form oil that will not discolor or otherwise stain concrete surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Installer Verification of Conditions: Examine conditions under which pavement is to be constructed with the materials and components specified in this section. Affected Prime Contractors, the Owner's Representative and the Architect shall be notified in writing of any conditions detrimental to the proper and timely installation of the work.
 1. When the installer confirms conditions as being acceptable to ensure proper and timely installation of the work and to ensure requirements of applicable

warranties or guarantees can be satisfied, submit written confirmation to the Architect. Failure to submit written confirmation and subsequent installation will be assumed to indicate conditions are acceptable to the installer.

3.02 PREPARATION

- A. Surface Preparation: Remove all loose material from the compacted sub-base surface prior to placing concrete.
- B. Forms: Set forms for 5" thick sidewalks unless specifically noted otherwise true to line and grade and anchor rigidly into position.
- C. Space expansion joints equally at not more than 30'-0" on center.
- D. Place joint filler at expansion joints and where new concrete abuts existing concrete paving and fixed structures and appurtenances. Protect the top edge of the joint filler during concrete placement with a temporary cap and remove after concrete has been placed. Fill expansion joint with joint sealant after the concrete has been cured complying with the sealant manufacturers installation instructions.

3.03 PLACEMENT OF FABRIC REINFORCEMENT

- A. Prior to placement of woven wire mesh, clean thoroughly of mill and rust scale and of coatings that could destroy or reduce bond.
- B. Install fabric reinforcement midway between the top and bottom of the concrete slab. Prior to placing concrete, place fabric reinforcement midway between the top and bottom of the slab and secure against displacement with the use of chair carriers or other approved materials.
- A. Lap edges and ends of adjoining sheets of fabric reinforcement at least half the mesh width. Offset end laps in adjacent sheets to prevent continuous joints at ends. Interrupt reinforcement at expansion joints, stopping 2" from edges.

3.04 PLACING CONCRETE

- A. Moisten the concrete subgrade as required to provide a uniform dampened condition at the time that concrete is placed.
- B. Do not place concrete around manholes or other structures until these items are brought to the required grade and alignment.
- C. Consolidate concrete by spading, rodding, forking or using an approved vibrator eliminating all air pockets, stone pockets and honeycombing. Work and float concrete surface so as to produce a uniform texture.

- D. Locate construction joints (if any) at expansion joint locations.
- E. Deposit and spread concrete in a continuous operation between control joints.

3.05 PLACING DETECTABLE WARNING SURFACE

- A. Detectable warning surfaces shall be installed 6 inches behind the edge of the curb.
- B. Domes shall be aligned on a square grid in the predominant direction of travel to permit wheels to roll between the domes.
- C. Install pre-cast units in accordance with the manufacturer's instructions.
- D. The curb, detectable warning surface, and sidewalk shall be flush with the elevation of the road surface.

3.06 FINISHING AND CURING

- A. After striking off and consolidating poured concrete, smooth the surface by screeding and floating. Adjust floating to compact the surface and produce a uniform texture.
- B. After floating, test the surface for trueness utilizing a 10' steel straight edge. Distribute concrete as required to remove surface irregularities and refloat repaired areas to provide a continuous smooth finish.
- C. Provide broom finish for walk surfaces.
- D. Finish edges of walk and expansion joints with a 1/2" radius edging tool. Space tool joints equally between expansion joints at approximately 5'-0" on center, unless specifically detailed otherwise on the construction documents.
- E. Apply curing and anti-spalling compound in accordance with the manufacturer's printed instructions.
- F. Saw control joints one inch deep after the concrete has set. Space control joints equally between expansion joints at approximately 5'-0" on center, unless specifically detailed otherwise on the construction documents.

3.07 FIELD QUALITY CONTROL

- A. Testing by Owner of Concrete Sidewalks
 - 1. Contractor Requirements
 - a. Provide access to concrete construction and concrete supplier's facilities

for representatives of the testing agency employed by the Owner to perform concrete testing and facility inspections as described below.

- b. Notify the Owner's Representative at least 48 hours in advance of each concrete placement to allow notification of the Owner's Testing Agency.

2. Concrete Testing During Construction by the Owner's Testing Agency

- a. Sampling Method: ASTM C 172 modified for slump to comply with ASTM C94.
- b. Slump Testing (ASTM C143): One test for each concrete load at the point of discharge. One test for each set of compressive strength test specimens, and one test from the middle of each load.
- c. Air Content Testing (ASTM C231, Pressure Method): One of each set of compressive strength test specimens; air content checked on every fourth load of "ready-mix" concrete delivered.
- d. Compressive Strength Testing
 - (1) Specimen Preparation: In compliance with ASTM C31 requirements to prepare one set of standard cylinders (minimum six each) for each compressive strength test.
 - (2) Specimen Testing: In compliance with ASTM C39 requirements for testing of one set of specimens for each 100 cubic yards (or fraction thereof) of each type of concrete placed in each day as follows
 - (a) Two specimens at seven days after concrete completion.
 - (b) Three specimens at 28 days after concrete placement.
 - (c) One specimen retained for later testing, if required.
- e. Reporting: Reports containing the following information shall be provided in writing by the Owner's Testing Agency to the Project Designer and the Prime Contractor the same day the tests are accomplished.
 - (1) Project identification name and number.
 - (2) Name of prime contractor, concrete supplier and testing agency.
 - (3) Number (or other designation) of truck delivering the concrete.
 - (4) Concrete type and class, date of placement, and location of concrete batch within the project.
 - (5) Design compressive strength at 28 days.
 - (6) Concrete mix proportions and materials.
 - (7) Compressive breaking strength and type of break for both 7 day test and 28 day test.
- f. Concrete Temperature: Test hourly when air temperature is 40 degrees F. or lower, or when the air temperature is 80 degrees F. or above, and each time compression testing specimens are prepared.

- g. Inspection of Supplier Facilities: The Owner's Testing Agency may inspect the concrete supplier's batch plant and review batching procedures as deemed necessary by the Owner, including inspecting the aggregate washing facility, concrete heating system, and concrete transportation equipment.
- h. Inspection of Reinforcing Steel: The Owner's Testing Agency may inspect placement of reinforcing steel. Do not begin concrete placement on any pour unless the Owner's Representative and the Architect have been notified at least one day preceding the pour to allow reasonable time for inspection of the reinforcing steel.

3.08 ADJUSTING AND CLEANING

A. Repairs and Protection of Concrete Sidewalks

- 1. Repair or replace broken or defective concrete as directed by the Architect.
- 2. Protect concrete from damage until acceptance of concrete sidewalk construction. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain walks as clean as possible by removing surface stains as they occur.
- 3. Sweep concrete walks and wash them free of stains, discoloration, dirt, and other foreign materials just prior to final acceptance.

B. Patching Existing Construction: Repair or patch adjacent existing concrete or other surfaces damaged from concrete sidewalk construction.

END OF SECTION

SECTION 321400

UNIT PAVERS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to install unit pavers as shown on the drawings and/or specified herein, including but not necessarily limited to the following:

- 1. Pervious pavers set in sand.

1.3 SUBMITTALS

- A. Product Data: For each component, each type and condition to include proposed sources of supply and material technical data, including the following:

- 1. For Brick Pavers Furnished
 - 2. For Base Course and Setting Bed Materials
 - a. Submit material certification and analysis report for aggregates and sand.

- B. Shop Drawings

- 1. Submit shop drawings for paver material type furnished and each related application condition of the project work. Include necessary coordination and preparation of composite drawing information together with other trades and contractors of adjacent components and conditions.
 - a. Do not fabricate any stone (except for samples) until shop drawings have been approved for fabrication by the Architect.

- b. Samples for Selection for Brick Unit Paving Materials: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of unit paver indicated. The approved samples shall set the finish standard for the work.
2. For Brick Pavers
 - a. Submit set of 3-unit samples of each unit paver material furnished and each unit paver finish type required. Include in each set the full and extreme range of exposed color, texture, and finish to be expected in the completed work.
 - b. The Architect's review will be for color, texture, and finish only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
3. Joint Materials: Submit samples for each condition of use to show selected color(s) and gradation. Dry materials shall be submitted in one-pound packages.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications for Unit Paving: Installations of paving and surfacing systems shall be by firm(s) which can exhibit proof of a minimum of five years prior successful experience with paving installations of equivalent type and similar scope of this Project.
 1. Use numbers of skilled workmen equal to work requirement or occasion. The skilled workmen shall be thoroughly trained and experienced in the necessary crafts and shall be completely familiar with specific requirements and methods needed for performance of the work of this Section.
- B. Source Limitations for Unit Paving: Obtain each type of unit paver, joint material, and setting material from one source with resources to provide materials and products of consistent quality in appearance and physical properties.
- C. Mock-ups for Unit Pavers: Before installing unit pavers, build mock-ups for each form and pattern of unit pavers required to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for the completed Work, including same base construction, special features for expansion joints, and contiguous work as indicated:
 1. Construct minimum 4.5' x 4.5' mock-up of concrete and brick paver surface with 2½" joints in the location as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mock-ups will be constructed.

3. The mock-up must be approved by the Architect before actual paving work may proceed. If necessary, remove and reconstruct mock-up surfacing until approved. Approved sample surfacing shall serve as standard of acceptance for paving and surfacing work of this Section.
4. Demolish and remove mock-up at a time approved by the Architect and when no longer required to serve as a standard of work.
5. Approved mock-up may become part of the completed Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect unit pavers and aggregate during storage and construction against soiling or contamination from earth and other materials.
 1. Cover pavers with plastic or use other packaging materials that will prevent loss of numbered markings.

1.6 PROJECT CONDITIONS

- A. Cold Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing. Conduct paving when ambient temperatures are 40 deg F or above.
- B. Weather Limitations for Stone Pavers
 1. Cold Weather Requirements: Protect stone paving against freezing when atmospheric temperature is 40 deg F and falling. Heat materials to provide mortar and grout temperatures between 40 and 120 deg F. Provide the following protection for completed portions of work for 24 hours after installation when the mean daily air temperature is as indicated: below 25 deg F, cover with insulating blankets; below 20 deg F, provide enclosure and temporary heat to maintain temperature above 32 deg F.

PART 2 PRODUCTS

2.1 PAVERS

- A. Brick Pavers: Unilock, Town Hall Pervious Pavers (9.875" X 3.875" X 2.75") or approved equal.
- B. Concrete pavers shall be the pavers salvaged from the site (15-1/2" x 15-1/2" x 2-3/4" approx.).

2.2 SETTING-BED AND JOINT MATERIALS

- A. Base course aggregate shall consist of sound, durable particle that is free from clay, silt or organic materials. Material shall be 100 percent crushed to 1" or less and meet gradation of NYS 733-0404.
- B. Sand setting bed shall consist of clean, washed concrete sand to conform with the following gradation:

<u>Sieve Size</u>	<u>% Passing</u>
3/8"	100
No. 4	90-96
No. 100	10-30

- C. Pea gravel: Nominal 3/8" pea stone, natural tan color.
- D. Screened Topsoil per Section 329000 Landscape Work
- E. Crusher dust: Nominal 1/4" crushed stone, black color.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces indicated to receive paving and conditions under which paving will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance for paving. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean unit paver surfaces that have become dirty or stained by removing soil, stains and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clean water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 INSTALLATION, GENERAL

- A. Layout of Work: Accurately lay out paving work to patterns and conditions as indicated, encountered on site, and specified for installation. Comply with set out control points as indicated and coordinate with other work of Project. Provide additional control points and stakeouts as required to effect correct alignments and grade elevations. Advise Architect of any discrepancies or on-site conditions detrimental to critical layouts and obtain approved correction.
- B. Do not use paving materials with chips, cracks, voids, discolorations, and other defects that might be visible or cause staining in finished work.
- C. Use full units without cutting where possible.
- D. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Hammer cutting is not acceptable.
 - 1. Scribe and field cut pavers as necessary to fit at obstructions. Produce tight and neat joints.
- E. Joint Pattern: Set unit pavers to comply with Contract Documents and approved shop drawings. Match for pattern by using units numbered in sequence as indicated on approved shop drawings.
- F. Tolerances: Do not exceed 1/16 inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.

3.4 SAND SETTING-BED APPLICATIONS

- A. Compact soil subgrade uniformly to at least 95 percent of ASTM D 1557 laboratory density.
- B. Place aggregate subbase and base over compacted subgrade. Compact subbase and base to 100 percent of ASTM D 1557 maximum laboratory density and screed to depth required to allow setting of brick pavers.
- C. Place leveling course and screed to a thickness of 1" to 1-1/2", taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.
- D. Set pavers with joint widths as indicated on drawings, being careful not to disturb leveling base.

- E. Vibrate pavers into leveling course by hand vibrator, taking care to avoid damaging pavers. Perform as many passes across paving with vibrator as is necessary to effect level installation.

3.5 JOINTS

- A. Spread joint fill material (sand, screened topsoil, or gravel as indicated on drawings) and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add joint fill material until joints are completely filled, then remove excess material.
 - a. Crusher dust fill for ½" joints.
 - b. Screened topsoil for 2½" joints.
- B. Repeat joint-filling process if settling occurs before acceptance.

3.6 REPAIR, CLEANING, AND PROTECTION

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units as intended. Install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Cleaning
 - 1. Remove excess joint fill material from exposed paver surfaces.

END OF SECTION