



American Legion New Town, ND

ICON PROJECT MANUAL

PROJECT NUMBER: 23-018

352 Main

New Town, ND 58763

ISSUE DATE: August 12th, 2026

ISSUED BY:

ICON ARCHITECTURAL GROUP

361 N Main, Suite 103

Watford City, ND 58854



**SECTION 00 0103
PROJECT DIRECTORY**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Identification of project team members and their contact information.

1.02 OWNER:

- A. Name: Beck-Sherven-Foreman Post American Legion Number 290
1. Address Line 1: 352 Main Street.
 2. Address Line 2: PO Box 692.
 3. City: New Town.
 4. State: North Dakota.
 5. Zip Code: 58763-0692.
- B. Primary Contact: All correspondence from the Contractor to the Architect will be direct, with copies to this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Title: Representing the Legion Board.
 2. Name: Brooks Goodall.
 3. Email: brooksg@rtc.email.

1.03 CONSULTANTS:

- A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Company Name: ICON Architectural Group.
 - a. Address Line 1: 361 N. Main.
 - b. Address Line 2: Suite 103.
 - c. City: Watford City.
 - d. State: North Dakota.
 - e. Zip Code: 58854.
 - f. Telephone: (701) 772-4266.
 2. Primary Contact:
 - a. Title: Architect.
 - b. Name: Jesse Lawrence.
 - c. Email: jessel@iconarchitects.com.
- B. Civil Engineering Consultant:
1. Company Name: Moore Engineering.
 - a. Address Line 1: 1411 W Dakota Pkwy.
 - b. Address Line 2: Suite 1B.
 - c. City: Williston.
 - d. State: North Dakota.
 - e. Zip Code: 58803.
 - f. Telephone: (701) 221-3937.
 2. Primary Contact:
 - a. Title: Civil Engineer.
 - b. Name: Rob Allen.
 - c. Email: rob.allen@mooreengineeringinc.com.

- C. Structural Engineering Consultant:
1. Company Name: ICON Architectural Group.
 - a. Address Line 1: 222 East Main Street.
 - b. Address Line 2: Suite B.
 - c. City: Mandan.
 - d. State: North Dakota.
 - e. Zip Code: 58554.
 - f. Telephone: (701) 751-0430.
 2. Primary Contact:
 - a. Title: Structural Engineer.
 - b. Name: Michael Jochim.
 - c. Email: michaelj@iconarchitects.com.
- D. Mechanical Engineering Consultant:
1. Company Name: Prairie Engineering, P.C..
 - a. Address Line 1: 1905 17th St. SE.
 - b. City: Minot.
 - c. State: North Dakota.
 - d. Zip Code: 58701-6108.
 - e. Telephone: (701) 852-6363.
 2. Primary Contact:
 - a. Title: Mechanical Engineer.
 - b. Name: Caleb Bulow.
 - c. Email: cbulow@prairieengineeringpc.com.
- E. Electrical Engineering Consultant:
1. Company Name: Prairie Engineering, P.C..
 - a. Address Line 1: 1905 17th St. SE.
 - b. City: Minot.
 - c. State: North Dakota.
 - d. Zip Code: 58701-6108.
 - e. Telephone: (701) 852-6363.
 2. Primary Contact:
 - a. Title: Electrical Engineer.
 - b. Name: Thomas Keeling.
 - c. Email: tkeeling@prairieengineeringpc.com.
- F. Foodservice Consultant:
1. Company Name: Foodservice Concept Design.
 - a. Address Line 1: 7900 International Dr.
 - b. City: Bloomington.
 - c. State: Minnesota.
 - d. Zip Code: 55425.
 - e. Telephone: 612-325-1494.
 2. Primary Contact:
 - a. Title: Principal Designer.
 - b. Name: Bryce Van Klein.
 - c. Email: bryce@fcdesign.com.

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Advertisement For Bids**American Legion Restaurant; New Town, ND**

Sealed Bids will be received for **New Town American Legion at the Four Bears Building; Room TBD, until 2:00 PM CT, Wednesday September 2nd, 2026. Bids will be publicly opened and read aloud shortly after 2 pm at the same location.** Bids shall be bid as Combined Contract (all trades) OR Multiple Contract Project consisting of the following prime contracts: General Construction, Mechanical Construction and Electrical Construction.

The Project is a restaurant/bar which includes a 4,600 sf addition and interior demolition and remodel of a current 3,700 sf space, for a total of 8,300 sf.

Interested Bidders are invited to a Pre-Bid Walkthrough on August 26th 2:00 pm CT at American Legion, 352 Main St, New Town, ND 58763

Drawings and specifications prepared by ICON Architectural Group, and their consultants may be seen and examined at the Architect's office or on the North Dakota Builder's Exchanges at Bismarck, Dickinson, Fargo, Grand Forks, & Minot.

Bids not fully complying with the requirements of North Dakota Century Code Chapter 48-01.2 or the Instructions to Bidders will not be read or considered. Any deficient bid received will be resealed and returned to the Bidder immediately. The Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

Each bid must be accompanied by separate envelope containing the Bidder's Contractor's license and bid security. The Bidder must be licensed for the full amount of the bid. Bid security in the form of a bidder's bond shall be submitted with each bid in the amount of 5 percent of the bid amount. No bids may be withdrawn for a period of 30 days after opening of bids.

All Prime contractors must contact ICON Architectural Group through Jesse Lawrence jessel@iconarchitects.com to be added to the Plan Holders list. Successful bidder shall begin the Work upon receipt of the Notice to Proceed and shall complete the Work within the Contract Time. Substantial Completion is October 1, 2027.

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

Contractor Responsible for TERO Compliance.

END OF SECTION

**SECTION 00 2110
INSTRUCTIONS TO BIDDERS - ND**

THE WORK: The project is a restaurant/bar which includes a 4,600 sf addition and an interior demolition and remodel of an existing 3,700 sf space, for a total of 8,300 sf.

SECURING DOCUMENTS

Copies of the proposed Contract Documents may be obtained upon the condition set forth in the Advertisement to Bid from section 00 1110 Advertisement for Bids.

BID FORM

In order to receive consideration, prepare bids in strict accordance with the following:

Make bids upon the forms provided, properly signed and with all items filled out. Do not change the wording of the bid form, and do not add words to the bid form. Make no additional stipulation or qualify the bid in any other manner. Unauthorized conditions, or provisions attached to the bid will be cause for rejection of the bid. If alterations by erasure or interlineation are made for any reason, the bidder must initial them.

No telegraphic or facsimile bid or modification of same (by same methods) will be considered. No bids received after the time fixed for receiving them will be considered. Late bids will be returned to the bidder unopened.

Address bids to the Owner, and deliver to the designated bid opening location on or before the day and hour set for opening the bids. Enclose each bid in a sealed envelope bearing the title of the Work, the name of the bidder, and the date and hour of the bid opening. Submit, **in duplicate**, signed copies of the bid.

If an alternate bid is asked for on a type or method of construction, which a bidder does not desire to bid, the bidder shall insert the words "no bid" in the proper place. If an alternate does not involve a change in price from the base bid, the bidder shall insert the words "no change" in the proper place. Unauthorized or bidders alternates will not be considered.

Each copy of the Bid shall include the legal name of the Bidder and a statement that the Bidder is a sole proprietor, a partnership, a corporation, or other legal entity. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

Each bid must give the full business address of the bidder and be signed by him with his usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing. Bids by corporations must be signed with the legal name of the corporation, followed by the signature and designation of the president, secretary, or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below the signature. A bid by a person who affixes to his signature the word "President", "Secretary", "Agent", or other designation, without disclosing his principal, may be held to be the bid of the individual signing.

The Bidder shall, within ten days of notification of award of a Contract for the Work, submit the following information to the Architect:

Proof of specified insurance;

Schedule of values;

Listing of the Work to be performed by the Bidder with his own forces and a list of names of the Sub-contractors or other persons or entities proposed for portions of the Work. Note that some information is required to be submitted with the Bid.

BONDS/SECURITY

Bid security in the amount stated in the invitation to Bid must accompany each bid. The successful bidder's security will be retained until he has signed the Contract and has furnished the required Certificates of Insurance.

The Owner reserves the right to retain the security of all bidders until the successful bidder enters into the Contract or until 30 days after bid opening, whichever is sooner. Other bid security will be returned upon request as soon as practicable. If any bidder refuses to enter into a Contract, the Owner may retain his bid security as liquidated damages but not as a penalty.

Prior to signing the Contract, the Owner will require the successful bidder to secure and post a Payment and Performance Bond, in the amount of 100% of the Contract Sum. Such bonds shall be issued by Surety acceptable to the Owner and by a Bonding Company licensed in the state where the construction is to be done. The Bond shall remain current during the course of Construction concurrent with the Contract amount as it remains unchanged or as it is modified by "Add-on" or "deduct" Change Orders.

EXAMINATION OF DOCUMENTS AND SITE OF WORK

Before submitting a bid, each bidder shall examine the Drawings read the Specifications and all other proposed Contract Documents, and shall visit the site of the Work. Each bidder shall fully inform himself prior to bidding as to existing conditions and limitations under which the Work is to be performed, and shall include in his bid a sum to cover the cost of items necessary to perform the Work as set forth in the proposed Contract Documents. No allowance will be made to a bidder because of lack of such examination or knowledge. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.

Bidders shall use complete sets of Bidding Documents in preparing Bids; neither Owner nor Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

Owner or Architect in making copies of Bidding Documents available on above terms do so only for purpose of obtaining Bids on the documented Work and do not infer permission for any other use.

Copies of standards referenced in Bidding Documents are available at the Architect's Office.

PROOF OF COMPETENCY OF BIDDER

A bidder may be required to furnish evidence satisfactory to the Owner that he and his proposed subcontractors have sufficient means and experience in the types of work called for to assure completion of the Contract in a timely and satisfactory manner. The Owner reserves the right to request a Contractor's Qualification Statement on AIA form A305 prior to the award of a contract.

WITHDRAWAL OF BIDS

A bidder may modify or withdraw his bid (including adjusting of bid security if necessary), either personally or by written request, at any time prior to the scheduled time for opening bids.

No bidder may withdraw his bid for a period of **30** calendar days after the date and time of the opening thereof, and bids shall be subject to acceptance by the Owner during this period.

AWARD OR REJECTION OF BIDS

It is the intent of the Owner to award a contract to the responsible bidder who has proposed a bid, including any alternates, which in his judgment, is in his own best interests, and does not exceed the funds available. The Owner reserves the right to reject any or all bids, and to waive any informality and irregularity in the bids and in the bidding, except as it is prohibited by law.

The Owner shall have the right to accept Alternates in any order or combination, and to determine the successful Bidder on the basis of the sum of the Base Bid and the Alternates accepted.

EXECUTION OF AGREEMENT

The bidder to whom the Contract is awarded shall, within fifteen calendar days after notice of award and receipt of Agreement forms from the Owner, sign and deliver required copies to the Architect.

At or prior to delivery of the signed Agreement, the bidder to whom the Contract is awarded shall provide to the Owner Certificates of Insurance required by the Contract Documents and such Payment and Performance Bond as are required by the Owner.

Bonds and Certificates of Insurance shall be approved by the Owner and Architect before the successful bidder may proceed with the Work. Failure or refusal to provide Bonds or Certificates of Insurance in a form satisfactory to the Owner and Architect shall subject the successful bidder to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.

Along with the signed Agreement forms and Bonds, the Bidder awarded the Contract shall submit:

- Performance/Payment Bonds
- Proof of specified Insurance
- Tax Clearance Certificate
- Workman's Compensation Certificate
- Schedule of Values

All of this material shall be returned to the Architect within 10 days of proof of receipt.

A Schedule of Values of Construction shall be kept current and copies submitted with each request for payment approval. The Architect will supply forms for this use. No payment request will be approved until the Schedule of Values is submitted and approved.

Note that per North Dakota Century Code 43-07-20 Employment Preference in Contracts:

"In all contracts, except those which involve federal-aid funds and when a preference or discrimination would be contrary to a federal law or regulation, hereafter let for state, county, city, school district, or township construction, repair, or maintenance work under any laws of this state, there shall be inserted a provision by which the contractor must give preference to the employment of bona fide North Dakota residents, as determined by section 54-01-26, with preference given first to honorably discharged disabled veterans and veterans of the armed forces of the United States, as defined in section 37-19.1-01, who are deemed to be qualified in the performance of that work."

INTERPRETATION OF CONTRACT DOCUMENTS PRIOR TO BIDDING

If any person contemplating submitting a bid for the Work is in doubt as to the true meaning of any part of the proposed Contract Documents, or finds discrepancies in or omissions from any part of the proposed Contract Documents, he may submit to the Architect a written request for interpretation thereof **not later than three days** before bids will be opened. The person submitting the request shall be responsible for its prompt delivery.

Interpretation or correction of proposed Contract Documents will be made only by Addendum and will be mailed or delivered to each bidder of record or document holder. The Owner or Architect will not be responsible for any other explanations or interpretations of the proposed Contract Documents. Each bidder is responsible for determining whether or not they have received an Addendum issued and acknowledge receipt on the Bid Forms submitted.

It is the intent of these documents to produce a design or function (including all materials, parts, equipment systems, and details) to comply with Americans With Disabilities Act of 2010 (ADA). Should any of the above portions or entities be specified or shown to contradict the ADA requirements, notify the Architect immediately and corrective measures will be issued by addendum.

Any item specified by reference to a Commercial Standard, Federal Specification, trade association standard, or other similar standard, shall comply with the requirements for design, manufacture, and installation of the latest revision thereto in effect at the time of bidding. Where this Specification requires a better quality than such standard, the Specification shall govern.

Where a proprietary material or method is specified for one use, the intention is to establish a standard of quality, performance or size and not to exclude another product of equal merit.

For proprietary items, bids shall be based on items named in the Specification, or on items, which the Architect designates, by Addendum as an approved equal. An item named in the Specification or by Addendum will be acceptable only when it meets all other requirements of the Specifications, including the specification of the manufacturer as of the date of bidding. Requests for approval of an item as equal will not be considered unless the Architect receives sufficient data for evaluation **seven days** prior to bid opening. The Architect will consider delivery time and availability of service as well as the product itself, in acting on a request for approval under provision of this paragraph.

In the event of an extended bid date the **original seven-day** requirement will remain in effect unless changed by written addendum.

Where the Contractor chooses to use an item approved as above but other than the one shown on the details or specified in detail, he shall be responsible for coordinating any necessary changes in other Work, and shall bear the cost of such changes. Current bidders and/or planholders lists will be issued with each addendum. No lists will be mailed or faxed to any bidder or supplier within the three (3) days prior

to the bid opening. No substitutions will be considered after the Contract award unless specifically provided in the Contract Documents.

Note that there is some VCT Flooring to be abated by the Owner's abatement contractor. See the Demo Plan and the Asbestos Report. General Contractor to work with Owner to allow this work to occur.

BID SUBMISSION (NORTH DAKOTA)

Only firms holding a North Dakota State Contractor's License of proper classification will be eligible to submit bids. The license number and date of renewal must appear on the proposal and be the proper class for the highest amount of the bid submitted. Licenses may be obtained through the Office of the Secretary of State, Bismarck, North Dakota. A Contractor must be the holder of such license at least ten days prior to date set to receive bids, to become a qualified bidder, and it must be renewed for the current year. Sub-contractors shall meet the requirements of Section 43-07 of the North Dakota Century Code.

Envelopes containing bids shall have on the outside in addition to the name and address of the Owner, the class and number of Contractor's license and date the license was last renewed, project name, Bidder name and address, and addenda received. The bid security and license renewal certificate shall be in a separate envelope fastened securely to the envelope containing the bid. All copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED FOR **NEW TOWN AMERICAN LEGION,** " on the face thereof.

Bids may be hand carried to the place of the bid opening just before the opening.

Each Bidder, or his suppliers, shall include and pay for all North Dakota sales taxes, use taxes, gasoline taxes, and vehicle license fees applicable to this work.

Note that Contractor shall be responsible for TERO compliance.

CONSTRUCTION TIME

All work should be substantially complete as soon as possible and the bidder shall indicate on his bid form the calendar days he proposes to have the Work completed.

All work is contemplated to begin immediately concurrent with the construction season(s) and carried forward to be substantially complete as soon as possible. The bidders shall indicate on the bid form the number of calendar days they deem required for completion. The date listed (by the accepted bidder) will then become the contractual completion date for references specified herein. Mechanical and Electrical Contractors may list "Per the G.C." in lieu of actual calendar days understanding they will be held to the selected General Contractor's number of calendar days listed on their bid form.

No damages, extended overhead expenses, or compensation for weather delays will be allowed or paid to the Contractor as a result of construction extending beyond the project schedule as outlined in the bid specifications.

The Agreement will include a stipulation that the Work be completed by the date or number of calendar days set forth by the Contractor on his bid following receipt of the Owner's Notice to Proceed.

PRE-BID WALKTHROUGH

A pre-bid walkthrough is scheduled for **August 26th at 2:00 pm CT** at the American Legion, 352 Main St, New Town, ND 58763. All interested bidders are welcome to attend to have bidding questions answered and review all existing conditions.

END OF SECTION

SECTION 00 3100
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

- A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of Contract Documents, as follows:
- B. Geotechnical Report: Entitled Report of Geotechnical Exploration Program, dated 03-25-26.
 - 1. A copy of the report is included for reference in the Spec Manual.
 - 2. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
 - 3. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in Contract Documents.
- C. Asbestos Survey: Entitled Asbestos Bulk Sample Collection & Analysis Report, dated 06-26-26.
 - 1. A copy is attached to this project manual for reference only.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

3.01 OBTAINMENT OF PERMITS

- A. Contractor to obtain the following required permits, at no cost to Owner:
 - 1. Building Permit for all trades.
- B. Building Permit Procedures: When required to obtain this permit:
 - 1. Complete and file permit application(s) with appropriate agency.
 - a. Submit application within five days of the Notice to Proceed.
 - 2. Pay required fees.
 - 3. Advise Architect if submission of modified documents is necessary to have the authorities having jurisdiction complete the plan review and approval process. Submit modified documents expeditiously.
 - 4. Do not commence execution of any item of work for which a permit has not been obtained.

END OF SECTION 00 3100

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Report of Geotechnical Exploration Program

**Proposed American Legion Addition
New Town, North Dakota
MTS No. G26-007**

For

Icon Architectural Group

March 25, 2026



March 25, 2026

Attn: Michael Jochim, PE
Icon Architectural Group
4050 Garden View Drive, Suite 101
Grand Forks, ND 58203

ref: **Geotechnical Exploration Program
American Legion Addition
New Town, North Dakota
MTS No. G26-007**

Dear Mr. Jochim:

Enclosed is the geotechnical exploration report for the proposed project. We are transmitting this report as an electronic file in pdf format. If you require a hard copy, please contact us. The work was conducted in general accordance with our proposal dated December 23, 2025.

Approximately 50 percent of the soil samples will be stored at the laboratory for a period of approximately 30 days from the date of this report. The samples will then be discarded unless we are requested to store them for a longer period.

We appreciate the opportunity to be of service to you on this project. If there are questions about the data or our recommendations, please contact us at 701-852-5553. Also, please contact us when you are ready for excavation observations and compaction test of controlled fill.

Sincerely,
MATERIAL TESTING SERVICES, LLC

A handwritten signature in black ink, appearing to read "Steven Wald", is written over the printed name.

Steven Wald, PE
President

MINOT
P.O. Box 634
Minot, ND 58702
701.852.5553



WILLISTON
7101 W 2nd Ave
Williston, ND 58801
701.572.4226

 materialtestingservicesnd.com

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New Town, North Dakota
MTS No. G26-007

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APPENDICES

APPENDIX A – FIELD EXPLORATION PROGRAM

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Boring Location Drawing
Soil Profile Drawing
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Soil Classification Sheet

APPENDIX B – LABORATORY TEST PROGRAM

- B.1 Testing Scope
- B.2 Test Methods

Attachments to Appendix B

Mechanical Sieve Analysis
Unconfined Compression Results

APPENDIX C

Precautions for Excavating & Refilling During Cold Weather

Report of Geotechnical Exploration

**Proposed American Legion Addition
New Town, North Dakota
MTS No. G26-007**

1. INTRODUCTION

1.1. Authorization

This work was conducted in accordance with our proposal dated December 23, 2025.

1.2. Scope of Services

The authorized scope of services included soil borings, laboratory testing and an engineering report.

Authorized drilling included a total of five soil borings to nominal depths of 25 feet. The boring locations were selected by Icon Architectural Group. Soil sampling was to be performed using standard penetration test (SPT) procedures. Laboratory tests in the proposal included moisture content, dry density, gradation through a #200 sieve, Atterberg limits (liquid & plastic limits) and unconfined compression testing. If soft cohesive soils were encountered undisturbed 3-inch diameter thin-walled Shelby tubes were to be taken.

The authorized engineering report includes the results of the field and laboratory testing as well as engineering recommendations regarding:

- a. Site preparation
- b. Foundation types and depths
- c. Allowable bearing capacity and estimated potential foundation settlement
- d. Potential construction difficulties
- e. Potential expansive or compressible soils
- f. Site drainage
- g. Exterior backfill
- h. Floor slabs
- i. Frost considerations
- j. Lateral Earth Pressures
- k. Pavements
- k. Excavation slopes
- l. Construction monitoring

Determining if there is potential on-site contamination is not included in the scope of services.

2. ENGINEERING REVIEW

2.1. Project Data

If the project information presented below is not correct or has been changed, it is necessary that the correct project data be presented to us for further review.

The proposed building will be a single-story, slab-on-grade steel structure. The building footprint will be approximately 4,500 square feet with final floor elevation near 1910.00 feet. We understand the building will be founded on standard shallow frost footings with interior column footings. Interior column footings are proposed to be set in ranges of 1.7 feet and 12 feet below final floor elevation.

It is our understanding that maximum column loads will not exceed 60 kips. We presume that strip footing loads will not exceed 2 kips per foot. We assume the maximum settlement under working load is 1 inch and a maximum differential settlement of ½ inch.

2.2. Special Concerns and Constructability

Fill and possible fill materials were observed at depths ranging from 3 to 4.5 feet below the proposed building footprint. Some of this fill may be suitable for reuse as controlled, compacted material beneath the floor. The fill consisted of mixed layers of sandy lean clay and sand with gravel. Although organic material was not detected during sampling, it could still be found during excavation. We recommend not relying on the existing fill to support floors or footings, as we cannot verify the compaction methods and effort applied on the existing fill.

Existing fill appears appropriate for reuse if it is free of organic material and placed under controlled, compacted conditions. If separating unsuitable fill from suitable material proves to be not economical, we recommend removing all existing fill and replacing it with

controlled, compacted fill. Please refer to Section 2.3.1 for further recommendations.

The excavation is expected to take place close to the current American Legion foundation. It is important to ensure that the existing foundation remains stable and is not undermined during construction. If the excavation extends within a 1H:1V line from the foundation, we advise using temporary shoring, underpinning, and potentially a more detailed construction plan for the site.

The existing clays are susceptible to frost heave in unheated environments. Therefore, seasonal frost movement of pavement, sidewalks and miscellaneous structures supported above the frost depth can be expected.

Groundwater was found at depths up to 13 feet, which corresponds to an elevation of 1895 feet. Contractors should be prepared for possible dewatering if excavations are close to this elevation. However, the seepage rate is expected to be low. Groundwater depth will vary due to seasonal changes and other climactic conditions.

2.3. Excavation and Site Preparation

2.3.1. Building

Uncontrolled fill should be removed from within the proposed building footprint. As discussed in Section 2.2 the on-site fill may be reused provided it is free of organics, has a liquid limit less than 40, and is placed and compacted in accordance with these recommendations. Estimated depths of fill encountered in the borings are summarized in Table 1. It should be noted that fill depths may vary between borings and actual conditions should be verified during construction.

Table 1 – Excavation Depths

Boring	Ground Elevation	Depth of Fill/Possible Fill (feet)	Approximate Elevation of Fill
SB-1	1908.3	3	1905.3
SB-2	1907.8	3	1904.8
SB-3	1908.8	4.5	1904.3
SB-4	1908.6	3	1905.6
SB-5	1908.8	4	1904.8

Based on the boring data, the base of fill is anticipated to terminate near Elevation 1904 feet across the building footprint. All fill within the building footprint should be removed and replaced with controlled, compacted fill.

Additional over-excavation beyond removal of existing fill is not anticipated. However, if excavations extend below the planned footing subgrade, lateral over-excavation should be provided at a slope of 1 horizontal to 1 vertical (1H:1V), measured from the bottom outside edge of the foundation.

All foundation excavations should be observed by the geotechnical engineer of record or their representative prior to placement of controlled fill or concrete. The purpose of these observations is to verify that unsuitable materials have been removed and that the exposed subgrade is suitable to support the design loads. Deeper excavations may be required in areas between borings where subsurface conditions differ.

Foundation excavations should be performed using a hydraulic excavator equipped with a smooth-edged bucket. Where native cohesive soils are exposed at subgrade the surface compaction should not be performed. If loose or disturbed material is encountered it should be removed. Where granular soils are encountered, the subgrade should be densified with a minimum of three passes of a heavy vibratory roller. Final subgrade preparation requirements should be determined based on field observations at the time of construction.

After the excavations are complete, backfill should be placed as soon as possible. Also, care should be taken so that the grades slope away from the excavations in case it rains. Although it is impossible to completely keep rainwater from the site, provisions must be made to protect the excavations as much as possible from the influx of rainwater or surface runoff both during and after construction. Water and any soft/saturated soil should be removed as soon as possible.

If groundwater enters the excavations, we recommend cleaning out loose soil in the excavation as much as possible while pumping the water out. Then placing a layer of compacted rock at the bottom of the excavation to transmit water to the sumps and to provide a working base for placing and compacting controlled fill and/or construction foundations. The rock layer should be 6 to 12 inches thick, depending on how much water enters the excavation. The rock should have 100 percent passing the 1½ -inch sieve and no more than 5 percent passing the #4 sieve. Alternative rock sizes may be considered if the 1½-inch minus rock is not readily available in the area. Pumping should be performed continuously until the backfill has been placed at least 3 feet above the water level. Several pump locations, consisting of perforated pipe with pumps, may be required to keep the water level below the top of the rock layer and not influence the overlying less select fill.

Controlled, compacted fill placed beneath footings and floor slabs may consist of pit-run or screened granular material with a maximum size of 1-1/2 inches or a non-organic, non-expansive lean clay that has a liquid limit less than 40. It appears that the on-site fill soils will be satisfactory for reuse but a final determination should be made at the time of construction. The on-site natural soils classified as Fat Clay or Lean Clay are anticipated to exceed this liquid limit and are not considered suitable for building fill. However, they will be suitable for exterior backfill.

Loose lift thicknesses of new fill should be no more than 8 inches. Any fill that is to support footings and floor slabs should be compacted to at least 95% of the maximum dry density as determined according to ASTM D 698 (standard Proctor). The sand should be moisture

conditioned as necessary to facilitate compaction. Clay soil should be moisture conditioned to within -2% and +3% of optimum.

If earthwork is done during periods of freezing temperatures, we recommend protecting the fill from freezing once it has been placed. No frozen soils should be used as fill and fill should not be placed on frozen ground. Earthwork could be difficult in the spring or late fall when conditions are often cool and wet.

2.4. Expansive Soils

Laboratory tests to directly measure volume change of the fat clays were not performed. However, laboratory index testing was performed on the fat clay to aid in determining whether the soils could be expansive. Our experience with fat clays in the project area is that they can be low to highly expansive. Based on the moisture contents and Atterberg limit tests, we calculated the liquidity index of the fat clay. The liquidity index of the clay specimens tested for index properties was 0.26 or greater. George B. Sowers and George F. Sowers in "Introductory Soil Mechanics and Foundations" indicate that little potential for swelling is present after the soil moisture reaches a point where the liquidity index is 0.25 or greater.

Precautions should be taken to reduce the potential for an increase or decrease of the soil moisture content both during and after construction. A drastic decrease in surface moisture may induce a low swell potential. To combat the risk, we recommend pouring the foundation in timely manner, not allowing the surface to dry out beneath the footings or slabs.

2.5. Frost Considerations

Foundations should be carried to frost depth as indicated in the following sections. Also, no frozen soil should be used as fill and no fill should be placed on frozen ground. Furthermore, the soil should be protected from freezing once it has been placed and compacted and until the building can be heated. Please note the attached information sheet "***Precautions for Excavating and Refilling During Cold Weather***" in Appendix C.

2.6. Foundation Recommendations

2.6.1. Footing Depths

Perimeter footings for heated buildings should be carried to a frost depth of 5 feet. The frost depth should be considered from final grade to the bottom of the footing. Interior footings can be placed at a convenient depth below the floor slab. We recommend using a frost depth of 7 feet for footings which will be in an unheated environment.

2.6.2. Bearing Capacity and Settlement

With the recommended site preparation, on-site observations by the geotechnical engineer and adequate compaction testing of the new fill, it is our opinion that continuous strip and column footings can be proportioned for a net allowable soil bearing capacity of up to 2,000 psf for continuous strip and 2500 psf for square column pads. This loading should provide a theoretical safety factor of 3 or more with respect to punching shear failure.

Our calculations suggest that total settlements should be 1 inch or less and that the differential settlement should be ½ inch or less. Settlement is expected to be immediate and elastic in nature.

2.6.3. Lateral Earth Pressures

Walls that must retain earth should be designed for the at-rest lateral earth pressure. For the clays at this site, we recommend that the at-rest pressure be considered equivalent to that generated by a fluid with a total unit weight of 75 pcf above groundwater levels. For active loads, we recommend using 50 pcf for the on-site clays above groundwater levels.

To resist lateral loads, we recommend assuming the natural undisturbed clays have an ultimate passive pressure equivalent to that generated by a fluid having a total unit weight of 330 pcf. For compacted sand, we recommend using an ultimate passive pressure of 425 pcf. If compacted fill is placed on the passive side next to the foundation resisting lateral loads, it should be compacted to at least 95 percent of maximum density as determined by ASTM D 698. In addition, those portions of the foundations within five feet of final grade in unheated

areas should be ignored when calculating passive resistance due to frost softening. An ultimate friction factor of 0.30 can be used between the bottom of the footing and the foundation soils. We wish to point out that these values will give the ultimate resistance to lateral loads. We recommend that a theoretical safety factor of 2.0 be applied for a safe design.

2.6.4. Methods of Analysis

The allowable foundation loading recommended was arrived at using the Terzaghi-Meyerhof bearing capacity equation with estimates using empirical correlations with the “N” values, as well as our experience with similar site and soil conditions.

Settlements were estimated using empirical correlations between the “N” values and the pressuremeter modulus, with consideration given to soil type. The pressuremeter modulus is determined with in-situ pressuremeter testing. The pressuremeter method of analysis was then used.

The equivalent passive, at-rest and active earth pressures were calculated using estimated unit weights and estimated angles of internal friction based on our experience, the laboratory testing and correlations with the Atterberg limits and soil type.

2.7. Floor Slabs

We recommend that the site be prepared as stated in **Section 2.3**. We recommend that slabs-on-grade be constructed structurally independent of foundation walls and columns. We also recommend a minimum 6-inch layer of free draining sand below the slabs. The sand should have less than seven percent passing the #200 sieve by weight. If it contains gravel, the gravel should have a maximum size of one inch. The sandy layer will be used to provide a working surface for concrete placement and serve as a capillary break.

With the site prepared as recommended, it is our opinion that the subgrade modulus of 200 pci can be used if a minimum of 18 inches of granular fill is used below the slab. A subgrade modulus of 150 pci can be used if clay fill is used to within 6 inches of the bottom of the slab.

2.8. Exterior Foundation Backfill

Foundation backfill should be placed in maximum loose lift thicknesses not to exceed 8 inches. For sidewalks or lightly loaded structures such as air conditioning units, the compaction should be increased to 95 percent. If there are driveways or parking areas within the backfill zone the fill 1 foot or more below the bottom of pavements should be compacted to at least 95 percent and fill within 1 foot should be compacted to at least 98 percent. Clay fill should be placed at a moisture content of -2 to +3 percent of the optimum moisture content and sand fill should be moisture conditioned as required to facilitate compaction.

2.9. Surface Drainage

We advise that adequate drainage be maintained during and after construction. Unless roof drainage is internal, we also recommend that downspouts and gutters or an appropriate closed conduit system be used to control roof drainage. Downspouts should have extensions that carry roof water well past the backfill line. Splash pads should also be provided at the end of the extensions, if applicable.

The exterior clay backfill should slope away from the buildings at a rate of 1 inch per foot or greater for a distance of at least 10 feet from the building in lawn areas. In parking areas much positive surface drainage should be provided as practical.

2.10. Exterior Slabs

Due to the potential for frost movement for exterior slabs, precautions should be taken to minimize future post construction movement of sensitive slabs due to frost action. Options available include excavating frost susceptible soils to a depth of 5 feet below the slabs and replacing them with non-frost susceptible sand containing less than 5 percent passing the #200 sieve by weight. Another option would be to place at least 4 inches of extruded

polystyrene foam insulation below the slabs and extend it at least 8 feet laterally past the edge of the slabs. Typically, 6 to 12 inches of sand is placed above the insulation for protection. A third option is to support the slabs or steps on foundations taken to frost depth. At least a 4-inch void should be provided below the slabs if this option is used.

Sensitive slabs are slabs that cannot tolerate much movement without causing some difficulties. An example would be the sidewalk or steps in front of a doorway. It is **not** intended to include all exterior sidewalks and driveways, etc.

2.11. Excavation Slopes

Safe excavations must be always maintained. The excavation contractor is responsible for the safety of the excavations. Current OSHA requirements should be carefully followed when excavating for the back slope of the excavation. The OSHA soil type and excavation requirements must be verified by a competent person for the contractor at the time of construction. MTS does not assume responsibility for site safety or the contractors' activities.

2.12. Site Classification for Seismic Design

The 2024 IBC and ASCE 7-22 were used to determine the site seismic conditions. The area is in seismic design category A. The building was given a risk category of II in accordance with the IBC. The design parameters presented in Table 4 were determined using the online ASCE Hazard Tool.

Table 4 – Site Seismic Design Parameters

Location	Lat. 47.980198, Long. -102.485698, Elevation 1904 (NAVD 88)		
Soil Class	DE		
S_s	0.065	S_{D1}	0.026
S₁	0.018	T_L	4
S_{MS}	0.085	P_{GAM}	0.033
S_{M1}	0.038	V_{S30}	185
S_{DS}	0.057		

The probability of an earthquake with ground accelerations high enough to induce liquefaction of the soil at this site is very low due to the historical low risk of an earthquake in the area.

3. CONSTRUCTION OBSERVATION AND TESTING

The recommendations contained in this report have been made based on the subsurface conditions found at the boring locations. It is possible that there are soil conditions on site that were not represented by the borings. Also, we presumed that close construction monitoring during excavation and backfilling would be authorized. Consequently, on-site observation during construction is considered integral to the successful implementation of the recommendations.

It is imperative that the geotechnical engineer be on site at the following times to observe the site conditions and effectiveness of the construction. We recommend that the testing be performed by the geotechnical engineer as the **Owner's** representative during construction.

3.1. Excavation Observations

The geotechnical engineer should observe the entire excavation bottom of the excavation prior to the placement of engineered fill and/or concrete. He would also be available for additional consultation and recommendations if necessary.

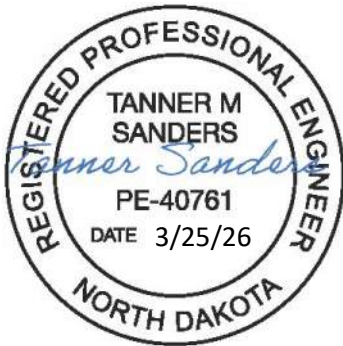
3.2. Placement of Fill

It will also be necessary to perform a representative number of compaction tests during placement of engineered fill. The tests should be performed to determine if the required compaction was achieved. As a general guideline, tests should be taken for each 2,500 square feet of embankment fill in building areas and every 100 linear feet in trench backfill for each 2-foot thickness of fill. The actual number of tests should be left to the discretion of the geotechnical engineer.

4. EXPLORATION LIMITATIONS

The recommendations contained in this report represent our professional opinions. These opinions were arrived at according to currently accepted engineering practices at this time and location. Other than this, no warranty is intended or implied.

This report is written by:



Tanner Sanders, P.E.
Geotechnical Engineer

Reviewed by:

A handwritten signature in black ink that reads "Steve Wald".

Steve Wald, PE
President

APPENDIX A – FIELD EXPLORATION PROGRAM

- A.1 Exploration Scope
- A.2 Surface Observations
- A.3 Subsurface Conditions
- A.4 Water Levels
- A.5 Soil Sampling
- A.6 Soil Classification Procedure

Attachments to Appendix A

Site and Boring Location Drawing

Boring Logs

Symbols & Descriptive Terminology on Test Boring Logs

Soil Classification Sheet

A. FIELD EXPLORATION PROGRAM

A.1 Exploration Scope

Five borings were planned to be drilled to nominal depths of 25 feet deep for the project. They were drilled on February 9, 2026. The boring locations are illustrated on the attached drawing provided by Icon Architectural Group on the back of this Appendix.

The borings were backfilled with the auger cuttings. Some settlement of these materials can be expected to occur. The final closure of the holes is the responsibility of the client or property owner.

A.2 Surface Observations

The site was located on the northeast corner of Market Place and Main Street in New Town, ND. The area for the proposed project is a parking lot immediately to the west of the existing American Legion building. The lot is mostly covered in asphalt pavement.

The property is relatively flat with minimum and maximum boring elevations of 1907.8 to 1908.8 feet. The TBM, temporary benchmark (assumed elevation 1906.95') was the rim of the manhole on the northwest side of the proposed site at the intersection of 1st Street N and Market Place.

A.3 Subsurface Conditions

The subsurface conditions encountered at the test locations are illustrated by means of the attached boring logs and profile drawing. We wish to point out that the subsurface conditions at other times and locations at the site may differ from those found at our test boring locations. If different conditions are encountered during construction, it is necessary that you contact us so that our recommendations can be reviewed. The test boring log also shows the possible geologic origin of the materials encountered.

Fill or possible fill were encountered at boring locations to depths of approximately 3 to 4.5 feet below existing grade. Beneath the fill, the soil consisted of fine alluvium consisting mostly of medium fat clay and lean clay. The fine alluvium deposits have consistencies of soft to firm. The consistency of cohesive and non-cohesive soils are based on the standard penetration resistance ("N" values).

A.4 Water Levels

Groundwater was measured in the borings at elevations between 1891.9 and 1895.8-feet during drilling and at completion of drilling before the borings were backfilled. This information is shown at bottom of the attached boring logs.

Water levels should be expected to fluctuate seasonally and annually. The water levels at the time of construction could be significantly different than what was recorded on the boring logs. The time of year the borings were drilled and the history of precipitation prior to drilling should be known when using the groundwater readings on the boring logs to extrapolate water levels at other points in time.

A.5 Soil Sampling

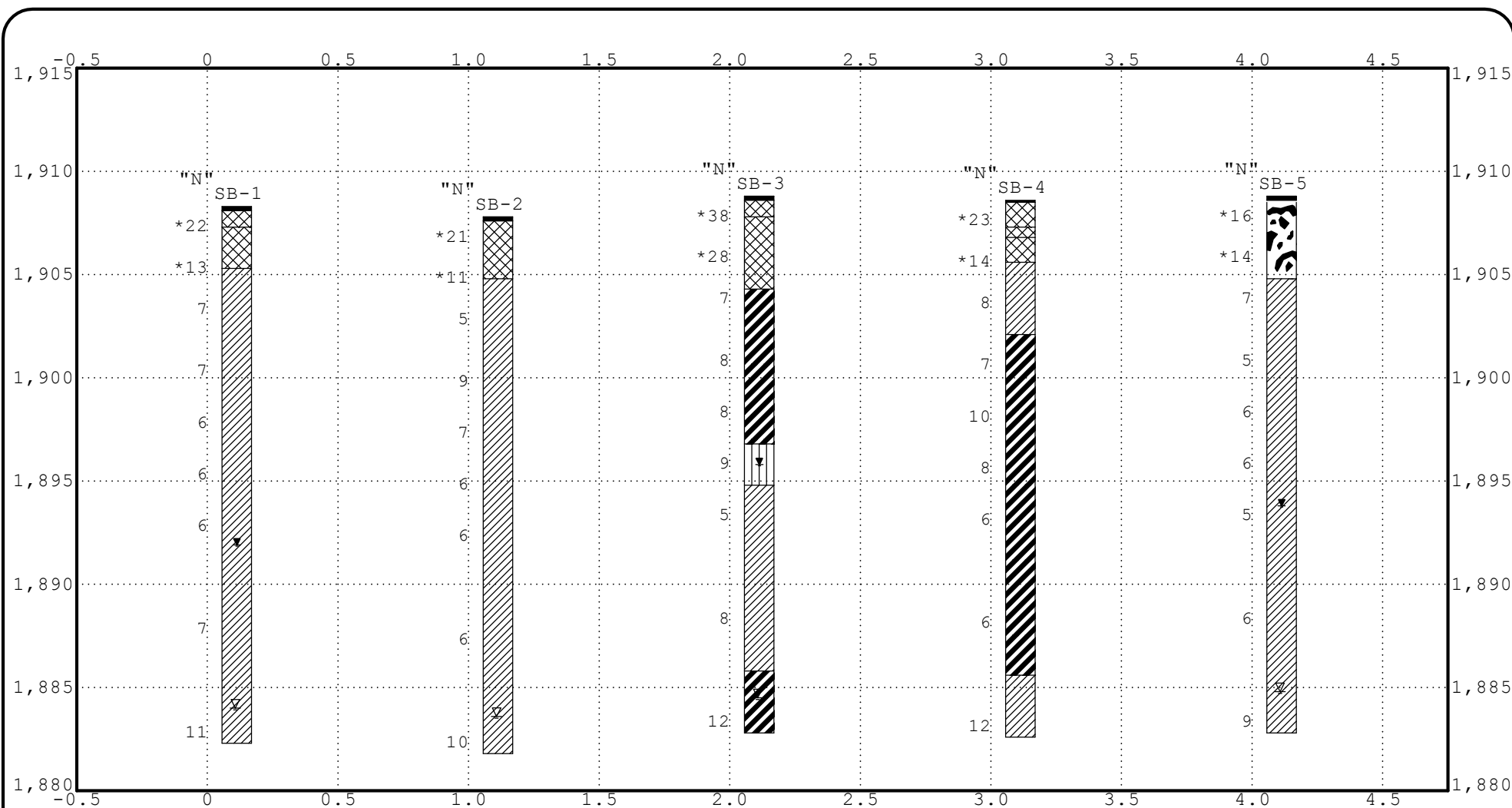
Soil sampling was done according to the procedures described by ASTM D1586. Using this procedure, a 2-inch O.D. split barrel sampler is driven into the soil by a 140-lb weight falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sampler an additional 12 inches is known as penetration resistance or "N" value. The "N" value is an index of the relative density of cohesionless soils and the consistency of cohesive soils.

We are retaining representative samples of the soil obtained during our field operations for approximately one month. We will then discard them unless we are notified further as to their disposition.

A.6 Soil Classification Procedure

As the samples were obtained in the field they were visually and manually classified by the crew chief according to ASTM D 2488. Representative portions of all samples were then sealed and returned to the laboratory for further examination and for verification of the field classification. In addition, selected samples were then submitted to a program of laboratory tests. Logs of the borings indicating the depth and identification of the various strata, the "N" value, the laboratory test data, water level information and pertinent information regarding the method of maintaining and advancing the drill holes are also attached. Charts illustrating the soil classification procedures, the descriptive terminology and symbols used on the boring logs are also attached.





SOIL PROFILE DIAGRAM		
American Legion		
New Town, ND		
PROJECT #	DATE	PLATE
G26-007	Mar 26	1

MATERIAL TESTING SERVICES, LLC

Box 634

Minot, North Dakota 58702

(701) 852-5553

SOIL BORING RECORD

BORING NUMBER

SB-1

SHEET 1 OF 1

PROJECT

American Legion

PROJECT LOCATION

New Town, ND

PROJECT NUMBER

G26-007

START DATE

2/9/26

FINISH DATE

2/9/26

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu (psf)
0.0	Asphalt Surfacing (2.5")		1908.3	Fill	SB			*22						
1908.1	Fill / Sandy Lean Clay , black and brown mixed, moist, trace gravel				SB			*13						
1907.3	Fill / Silty, Clayey Sand with Gravel , light brown, moist			Fine Alluvium	SB			7						Qu=2895
3.0														
1905.3	Lean Clay , light brown, mottled, moist, silt lenses, borderline CL/CH, soft to firm (CL)							92			30			
	(2) 3TP taken at 5-7 & 9-11 in seperate bore hole								7					
														
								100	6		30	46	20	Qu=2257
	Silty Clay Layer at 13 feet								6		35	40	20	
														
								6						
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
														
26.0	End of Boring													
1882.3	NM = None Measured *=High Blow Count Likely due to Frost													

DRILLER **RB**
METHOD **4" FA, 0-24.5'**
LOGGER **JF**
REVIEWER **TS**
DRILL RIG **CME 45**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
2/9/2026	1040	26	none	24.4		24.3
2/9/2026	1440			20.8		16.4

MATERIAL TESTING SERVICES, LLC

Box 634

Minot, North Dakota 58702

(701) 852-5553

SOIL BORING RECORD

BORING NUMBER

SB-2

SHEET 1 OF 1

PROJECT

American Legion

PROJECT LOCATION

New Town, ND

PROJECT NUMBER

G26-007

START DATE

2/9/26

FINISH DATE

2/9/26

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu (psf)
0.0	Asphalt Surfacing (2.5")		1907.80	Fill	SB			*21			5			
1907.6	Fill / Sand with Silt and Gravel , brown, moist				SB			*11						
3.0														
1904.8	Medium Fat Clay brown, moist, silt lenses, soft to firm (CH)			Fine Alluvium	SB			5						
			1902.80											
			1897.80											
			1892.80								30	59	20	
			1887.80											
			1882.80											
									</					

DRILLER **RB**
METHOD **4" FA, 0-24.5'**
LOGGER **JF**
REVIEWER **TS**
DRILL RIG **CME 45**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
2/9/2026	1130	26	none	24.4		24.1
2/9/2026	1445			12.3		NM

MATERIAL TESTING SERVICES, LLC

Box 634

Minot, North Dakota 58702

(701) 852-5553

SOIL BORING RECORD

BORING NUMBER

SB-3

SHEET 1 OF 1

PROJECT

American Legion

PROJECT LOCATION

New Town, ND

PROJECT NUMBER

G26-007

START DATE

2/9/26

FINISH DATE

2/9/26

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS			
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)
0.0	Asphalt Surfacing (2.5")		1908.0	Fill	SB			*38					
1908.6	Fill / Lean Clay with Sand , dark brown, moist				SB			*28			3		
1907.8	Fill / Silty Sand with Gravel , light brown, moist				SB			7					
4.5				Fine Alluvium	SB			8					
1904.3	Medium Fat Clay , brown, moist, soft (CH)		1903.8		SB			8					
					SB			8					
					SB			8					
12.0			1898.8		SB			9			24		
1896.8	Sandy Silt , brown, moist, loose (ML)				SB			5					
14.0					SB			8					
1894.8	Lean Clay , brown, moist, silt lenses, borderline CL/CH, soft (CL)		1893.8		SB			12					
					SB								
23.0			1888.8		SB								
1885.8	Medium Fat Clay , brown, moist, silt lenses, firm (CH)				SB								
26.0			1883.8		SB								
1882.8	End of Boring NM = None Measured *=High Blow Count Likely due to Frost												

DRILLER RB
METHOD 4" FA, 0-24.5'
LOGGER JF
REVIEWER TS
DRILL RIG CME 45

WATER LEVEL
MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
2/9/2026	1220	26	none	24.3		24.2
2/9/2026	1445			13.3		13

MATERIAL TESTING SERVICES, LLC

Box 634

Minot, North Dakota 58702

(701) 852-5553

SOIL BORING RECORD

BORING NUMBER

SB-4

SHEET 1 OF 1

PROJECT

American Legion

PROJECT LOCATION

New Town, ND

PROJECT NUMBER

G26-007

START DATE

2/9/26

FINISH DATE

2/9/26

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu (psf)
0.4	Asphalt Surfacing (1.5")		1908.6	Possible Fill	SB			*23						
1908.5	Fill / Lean Clay with Sand , dark brown, moist, trace gravel				SB			*14						
1907.3	Fill / Silty Sand with Gravel , light brown, moist			Fine Alluvium	SB			8						
1906.8	Fill / Sandy Lean Clay , brown, moist, trace gravel													
1905.6	Lean Clay , brown, moist, silt lenses, soft (CL)		1903.6											
6.5														
1902.1	Medium Fat Clay , brown, moist, silt lenses, soft (CH)				SB			7						
			1898.6		SB		97	10		29				
					SB			8						
			1893.6		SB			6		41	53	22		
			1888.6		SB			6						
23.0														
1885.6	Lean Clay , brown, moist, silt lenses, firm (CL)				SB			12						
26.0			1883.6											
1882.6	End of Boring NM = None Measured *=High Blow Count Likely due to Frost													

DRILLER **RB**
METHOD **4" FA, 0-24.5'**
LOGGER **JF**
REVIEWER **TS**
DRILL RIG **CME 45**

WATER LEVEL
MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
2/9/2026	1420	26	none	24.1		NM

MATERIAL TESTING SERVICES, LLC

Box 634

Minot, North Dakota 58702

(701) 852-5553

SOIL BORING RECORD

BORING NUMBER

SB-5

SHEET 1 OF 1

PROJECT

American Legion

PROJECT LOCATION

New Town, ND

PROJECT NUMBER

G26-007

START DATE

2/9/26

FINISH DATE

2/9/26

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu (psf)
0.0	Asphalt Surfacing (2")		1908.80	Possible Fill	SB			*16						
1908.6	Sandy Lean Clay , dark brown to brown, moist, trace gravel (CL)				SB			*14						
4.0	Possible fill to 4 feet													
1904.8	Lean Clay , brown, moist, trace to a little gravel, borderline CL/CH, silt lenses, soft (CL)		1903.80	Fine Alluvium	SB			7						
					SB			5						
					SB		96	6		29				
					SB			6		35	49	22		
					SB			5	▼					
					SB			6						

DRILLER **RB**
METHOD **4" FA, 0-24.5'**
LOGGER **JF**
REVIEWER **TS**
DRILL RIG **CME 45**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
2/9/2026	1315	26	none	24.1		24
2/9/2026	1445			15.1		15

APPENDIX B – LABORATORY TEST PROGRAM

- B.1 Testing Scope
- B.2 Test Methods

Attachments to Appendix B

Mechanical Sieve Analysis
Unconfined Compression Results

B. LABORATORY TEST RESULTS

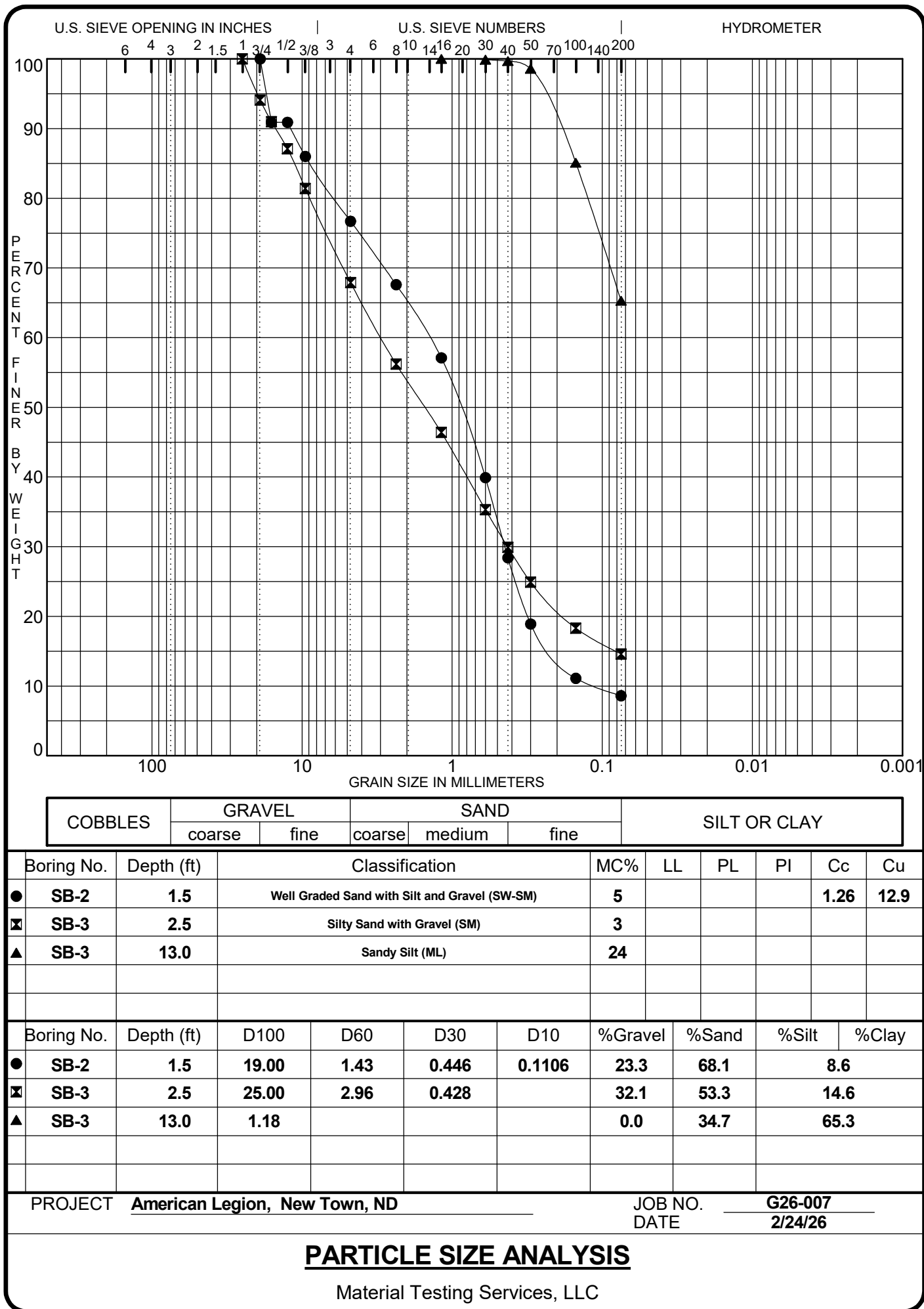
B.1 Testing Scope

Laboratory testing was conducted to characterize soil properties including Atterberg limits (liquid and plastic limits), mechanical sieve analysis, in-situ moisture content, in-situ density, CBR, and moisture-density relationship.

B.2 Test Methods

Testing and classification of soil was performed in accordance with the following standards as applicable:

Description	ASTM Method
Unified soil classification system	D 2487
Atterberg limits	D 4318
In-situ moisture content	D 2216
Sieve analysis	D 422, C 117, C 136
Moisture-density relationship	D 698 or D 1557
In-situ dry density	Direct measurement
Unconfined compression, Qu	D 2166
CBR	D 1883



MATERIAL TESTING SERVICES, LLC

PO Box 634
Minot, ND 58702
(701) 852-5553

UNCONFINED COMPRESSIVE STRENGTH ASTM D 2166

7101 W 2nd Ave
Williston, ND 58801
(701) 572-4226

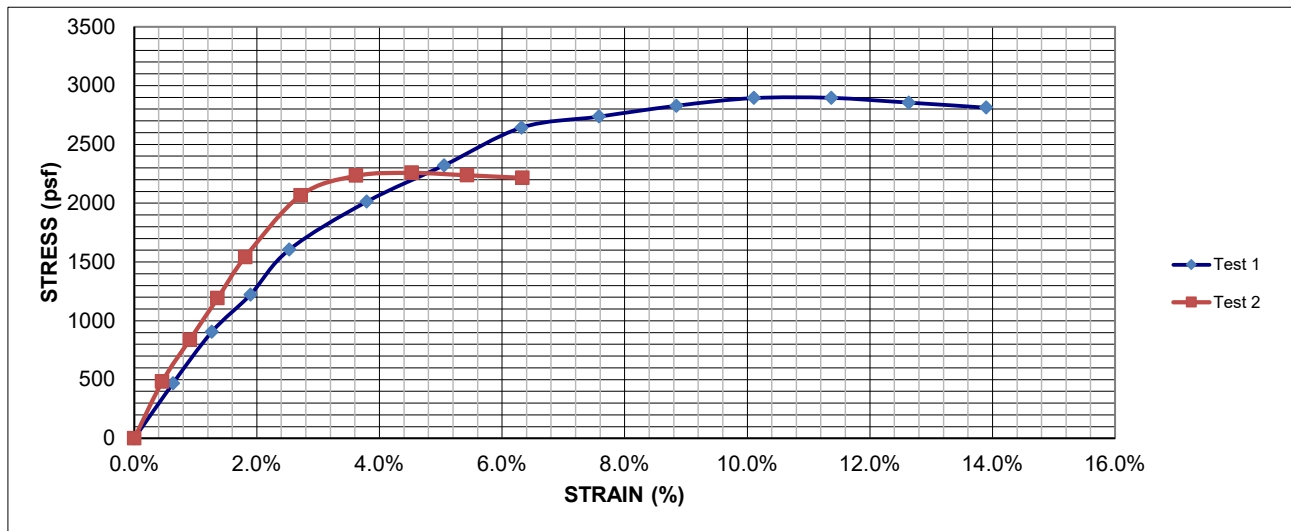
PROJECT: AMERICAN LEGION
NEW TOWN, ND

10-Mar-26

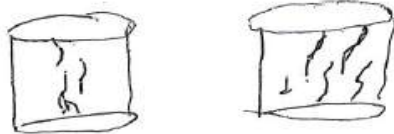
REPORTED TO: ICON ARCHITECTURAL GROUP

MTS No. G26-007

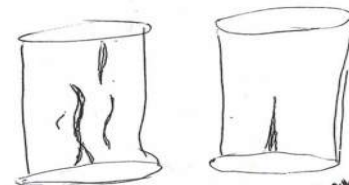
Specimen ID:	Test 1	Test 2
	Boring 1	Boring 1
Soil Class:	TW, 5-7 feet	TW, 9-11 feet
	Lean Clay (CL)	Lean Clay (CL)
Dry Density (pcf):	92.3	100.2
Water Content:	29.5%	30.1%
Sample Dia. (mm):	71.0	70.0
Sample Ht (mm):	100.6	140.4
Height/Diameter:	1.42	2.01
Unc. Strength (psf):	2895	2257
Strain at Failure (%):	11.4	4.5



Test 1



Test 2



AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL.

Material Testing Services, LLC

by *SA Well*

APPENDIX C

Precautions for Excavating & Refilling During Cold Weather

PRECAUTIONS FOR EXCAVATING AND REFILLING DURING COLD WEATHER

The winter in North Dakota presents specific problems for foundation construction. Soils which are allowed to freeze undergo a moisture volume expansion, resulting in a loss of density. These frost-expanded soils will consolidate upon thawing, causing settlement of any structure supported on them. To prevent this settlement, frost should not be allowed to penetrate the soil below any proposed structure.

Ideally, winter excavation should be limited to areas small enough to be refilled to a grade higher than footing grade on the same day. Typically, these areas should be filled to floor grade. Trenching back down to unfrozen soils for foundation construction can then be performed just prior to footing placement. The excavated trenches should be protected from freezing by means of insulating or heating during foundation construction. Backfilling of the foundation trenches should be performed immediately after the below-grade foundation construction is finished. In addition, any interior footings, or footings designed without frost protection should be extended below frost depth, unless adequate precautions are taken to prevent frost intrusion until the building can be enclosed and heated.

In many cases, final grades cannot be attained in one day's time, even though small areas are worked. In the event final grade cannot be attained in one day's time, frost can be expected to develop overnight. The depth of frost penetration can be minimized by leaving a layer of loose soil on top of the compacted material overnight. However, any frost which forms in this loose layer, or snow, should never be used as fill material.

After the structure has been enclosed, all floor slab areas should be subjected to ample periods of heating to allow thawing of the soil system. Alternatively, the frozen soil can be completely removed and replaced with an engineered fill. The floor slab areas should be checked at random and representative locations for remnant areas of frost, and density tests should be performed to document fill compaction prior to slab placement.

Due to the potential problems associated with fill placement during cold weather, any filling operations should be monitored by a full-time, on-site soils technician. Full-time monitoring aids in detecting areas of frozen material, or potential problems with frozen material within the fill, so that appropriate measures can be taken. The choice of fill material is particularly important during cold weather, since clean granular fill materials can be placed and compacted more efficiently than silty or clayey soils. In addition, greater magnitudes of heaving can be expected with freezing of the more frost susceptible silts and clays.

If more specific frost information or cold weather data concerning other construction materials is required, please contact us.

June 26, 2026

Mr. Jesse Lawrence
ICON Architectural Group
4000 Garden View Drive Suite 101
Grand Forks, ND 58201

RE: P26-0213 ASBESTOS BULK SAMPLE COLLECTION &
ANALYSIS REPORT
NEW TOWN AMERICAN LEGION
352 MAIN STREET
NEW TOWN, ND 58763

Dear Mr. Lawrence:

Attached please find the analytical results of the thirty (30) bulk samples of suspect asbestos-containing materials collected by a Badlands Environmental Consultants, Inc. (BEC) representative on June 22, 2026, from the above referenced building, located in New Town, ND (Site). This asbestos assessment was conducted within the interior of the Site.

The field representative for BEC was Environmental Special Nick Jangula, who is accredited by the Environmental Protection Agency (EPA) and certified by the North Dakota Department of Environmental Quality (NDDEQ) as an Asbestos Building Inspector.

ASBESTOS BULK SAMPLE COLLECTION & ANALYTICAL PROCEDURES

The samples of suspect ACM were collected in accordance the EPA Guidance Document, Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials (EPA 560/5.85-030a, October 1985).

The bulk samples were analyzed utilizing the Environmental Protection Agency's Method for the Determination of Asbestos in Bulk Building Materials. (EPA-600/R-93/116).

The samples were analyzed by Crisp Analytical, L.L.C. (Crisp) in Carrollton, TX. Crisp is accredited by the American Industrial Hygiene Association (AIHA) through their involvement in the National Laboratory Voluntary Accreditation Program (NVLAP) Bulk Asbestos Samples Quality Assurance Programs.

RESULTS

Results of the PLM analysis indicates that five (5) of the 30 bulk samples contain asbestos. The EPA and OSHA define an asbestos-containing material as one that contains greater than one percent (>1%).

The following materials were determined to be an asbestos-containing material:

- Plaster – Stairwell to downstairs bar (Sample 14).
- Floor tile – Under LVP in main storage area (Samples 20 & 21).
- 9" x 9" floor tile – Basement dance area and behind bar (Samples 24 & 25).

The following materials were determined to be non-asbestos-containing materials:

- 2' x 4' ceiling tiles – Middle storage area and office area (Samples 1, 2, 12, & 13).
- 12" x 12" floor tile with yellow mastic – Office area and main entry (Samples 3, 4, 16, & 17).
- Plaster – Ceiling above office area and main area, break area and storage area exterior wall, office area behind wainscoting, & downstairs behind bar (Samples 5 – 9, & 15).
- Sheetrock & taping compound – Main area, file storage area, basement (Samples 10, 11 & 28).
- 1' x 1' ceiling tiles – Men's upstairs restroom & basement dance area (Samples 18, 19, 26, & 27).
- Base cove with glue – Main entry & stairwell to basement (Samples 22, 23, 29 & 30).

Note: Sample locations noted in the above sections indicate where the samples were collected. These materials may be located within other areas of the Site building.

Please refer to the attached Crisp Materials Characterization – Bulk Asbestos Analysis Report dated June 26, 2026, for complete analytical results.

SUMMARY & RECOMMENDATIONS

Asbestos-containing plaster was found only in the stairwell to the basement. This material is considered a friable surfacing material by the EPA (can be crumbled or reduced to powder by hand pressure when dry). This material can remain in the building provided it is not affected by the upcoming renovation project. If the plaster will be affected by the renovation project it will need to be abated from the Site, prior to the start of the renovation project, in accordance with EPA NESHAPS, OSHA Class I, and NDDEQ abatement regulations.

The asbestos containing floor tile and black mastic is classified as Category I non-friable materials by the EPA. These materials are non-regulated and can remain in the building during a renovation project provided renovation activities do not disturb these materials. However, if these materials will be disturbed by future renovation activities, they will need to be abated in accordance with EPA NESHAPS, OSHA Class II, and NDDEQ abatement regulations.

A Notice of Intent for Demolition/Renovation must be filed with the NDDEQ ten working days prior to the start of any renovation project if the project will involve the disturbance of greater than 160 square feet or 260 lineal feet of regulated asbestos-containing materials **or** if the building is scheduled for demolition.

If any suspect building materials are uncovered during any future renovation or demolition projects, immediately notify BEC to evaluate these materials.

Sincerely,
BADLANDS ENVIRONMENTAL CONSULTANTS, INC.



James D. McGurren
President/CEO

Attachment

Crisp Analytical, L.L.C.

Materials Characterization – Bulk Asbestos Analysis Report

CA Labs
Dedicated to Quality

Crisp Analytical, L.L.C.
1929 Old Denton Road
Carrollton, TX 75006
Phone 972-242-2754
Fax 972-242-2798



CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634

Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

Badlands Env. Consultants

1008 East Central Avenue
Bismarck, ND 58501

Customer Project: P26-0213, 352 Main St. New Town, ND 5
Reference #: CAL26064973AG Date: 06/26/26

Analysis and Method

Summary of polarized light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of a stereomicroscope. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are performed. Calibrated liquid refractive oils are used as liquid mounting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjunction with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may contain trace amounts of actinolite/tremolite. When not detected by PLM, these samples should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may contain a regulated asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be detectable by PLM analysis and should be analyzed by TEM bulk protocols.

A "trace asbestos" will be reported if the analyst observes far less than 1% asbestos. CA Labs defines "trace asbestos" as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

Since allowable variation in quantification of samples close to 1% is high, <1% may be reported. Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos or "trace asbestos". **In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.**

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). CA Labs is also accredited by AIHA LAP, LLC. in the PLM asbestos field of testing for Industrial Hygiene. All analysts have completed college courses or hold a degree in a natural science (geology, biology, or environmental science). Recognition by a state professional board in one these disciplines is preferred, but not required. Extensive in-house training programs are used to augment the educational background of the analyst. The Laboratory Director and Quality Manager have received supplemental McCrone Research training for asbestos identification. Analysis performed at Crisp Analytical Labs, LLC 1929 Old Denton Road Carrollton, TX 75006

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235
AIHA LAP, LLC Laboratory #102929

CA Labs
Dedicated to Quality

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Fax 972-242-2798

CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634

Overview of Project Sample Material Containing Asbestos

Customer Project:			P26-0213, 352 Main St. New Town, ND 58763		CA Labs Project #: CAL26064973AG
Laboratory Sample ID	Sample #	Layer #	Analysts Physical Description of Subsample	Asbestos type / calibrated visual estimate percent	List of Affected Building Material Types
59065	14	14-1	Plaster/ white surfaced off-white plaster	2% Chrysotile	white surfaced off-white plaster gray floor tile black mastic with debris red floor tile tan floor tile
59071	20	20-2	gray floor tile	3% Chrysotile	
59071		20-3	black mastic with debris	<1% Chrysotile	
59072	21	21-2	gray floor tile	3% Chrysotile	
59072		21-3	black mastic with debris	<1% Chrysotile	
59075	24	24-2	red floor tile	3% Chrysotile	
59076	25	25-1	9x9 Floor Tile with Mastic/ tan floor tile	3% Chrysotile	

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235
AIHA LAP, LLC Laboratory #102929

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

ca - carbonate
gypsum - gypsum
bi - binder
or - organic
ma - matrix
mi - mica
ve - vermiculite
ot - other

pe - perlite
qu - quartz

fg - fiberglass
mw - mineral wool
wo - wollastinite
ta - talc
sy - synthetic
ce - cellulose
br - brucite
ka - kaolin (clay)

pa - palygorskite (clay)

This report relates to the items tested as received. This report is not to be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, AIHA LAP, LLC, or any other agency of the federal government. This report may not be reproduced except in full without written permission from CA Labs. These results are submitted pursuant to CA Labs' current terms and sale, condition of sale, including the company's standard warranty and limitations of liability provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, CA Labs will store the samples for a period of ninety (90) days before discarding. A shipping or handling fee may be assessed for the return of any samples.

CA Labs
Dedicated to Quality

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Fax 972-242-2798

CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634

Polarized Light Asbestiform Materials Characterization

Customer Info:
Badlands Env. Consultants
1008 East Central Avenue
Bismarck, ND 58501

Attn:

Customer Project:
P26-0213, 352 Main St. New
Town, ND 58763
Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335

Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Description of Subsample	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
59052	1		1-1	2x4 Ceiling Tile/ white surfacing	y	None Detected		100% qu,bi
59052			1-2	tan ceiling tile	y	None Detected	40% ce 30% fg	30% qu,pe
59053	2		2-1	2x4 Ceiling Tile/ white surfacing	y	None Detected		100% qu,bi
59053			2-2	tan ceiling tile	y	None Detected	40% ce 30% fg	30% qu,pe
59054	3		3-1	12x12 Floor Tile and Glue/ off-white floor tile	y	None Detected		100% qu,ca
59054			3-2	tan mastic	y	None Detected		100% gy,bi
59055	4		4-1	12x12 Floor Tile and Glue/ off-white floor tile	y	None Detected		100% qu,ca

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

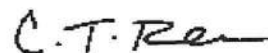
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion staining / becke line method.

ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst



Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages effecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze

6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

CA Labs
Dedicated to Quality

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Phone 225-751-5632
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Polarized Light Asbestiform Materials Characterization

Customer Info:
Badlands Env. Consultants
1008 East Central Avenue
Bismarck, ND 58501

Attn:

Customer Project:
P26-0213, 352 Main St. New
Town, ND 58763
Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335

Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Description of Subsample	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
59055			4-2	tan mastic	y	None Detected		100% gy,bi
59056	5		5-1	Plaster/ off-white plaster	y	None Detected		100% qu,ca
59057	6		6-1	Plaster/ white surfaced off-white plaster	n	None Detected		100% qu,bi,ca
59058	7		7-1	Plaster/ white surfaced off-white plaster	n	None Detected		100% qu,bi,ca
59059	8		8-1	Plaster/ white surfaced off-white plaster	n	None Detected		100% qu,bi,ca
59060	9		9-1	Plaster/ white surfaced off-white plaster	n	None Detected		100% qu,bi,ca
59061	10		10-1	Sheetrock and Taping Compound/ white compound	y	None Detected		100% qu,ca

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

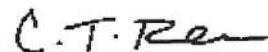
ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages effecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze



Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

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Polarized Light Asbestiform Materials Characterization

Customer Info:
Badlands Env. Consultants
1008 East Central Avenue
Bismarck, ND 58501

Attn:

Customer Project:
P26-0213, 352 Main St. New
Town, ND 58763
Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335

Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Com ment	Layer #	Analysts Physical Description of Subsample	Homo-geneo us (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
59061			10-2	white compound (beneath tape)	y	None Detected		100% qu,ca
59061			10-3	white drywall with brown paper	n	None Detected	22% ce	78% qu,gy
				Sheetrock and Taping Compound/ tan surfaced white				100%
59062	11		11-1	compound	n	None Detected		qu,bi,ca
59062			11-2	white drywall with brown paper	n	None Detected	21% ce	79% qu,gy
				2x4 Ceiling Tile/ white				
59063	12		12-1	surfacing	y	None Detected		100% qu,bi
59063			12-2	tan ceiling tile	y	None Detected	100% ce	
				2x4 Ceiling Tile/ white				
59064	13		13-1	surfacing	y	None Detected		100% qu,bi

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

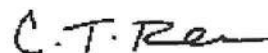
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst



Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
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4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze

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7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

CA Labs
Dedicated to Quality

Crisp Analytical, L.L.C.
1929 Old Denton Road
Carrollton, TX 75006
Phone 972-242-2754
Fax 972-242-2798

CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634

Polarized Light Asbestiform Materials Characterization

Customer Info:
Badlands Env. Consultants
1008 East Central Avenue
Bismarck, ND 58501

Attn:

Customer Project:
P26-0213, 352 Main St. New
Town, ND 58763
Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335
Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Subsample	Description of	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
59064			13-2		tan ceiling tile	y	None Detected	100% ce	
59065	14		14-1		Plaster/ white surfaced off-white plaster	n	2% Chrysotile	98% qu,bi,ca	
59066	15		15-1		Plaster/ off-white surfaced off-white plaster	n	None Detected	100% qu,bi,ca	
59067	16		16-1		12x12 Floor Tile and Glue/ gray floor tile	y	None Detected	100% qu,ca	
59067			16-2		tan mastic	y	None Detected	100% gy,bi	
59068	17		17-1		12x12 Floor Tile and Glue/ gray floor tile	y	None Detected	100% qu,ca	
59068			17-2		tan mastic	y	None Detected	100% gy,bi	

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

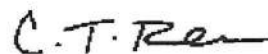
ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst

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Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

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10. TEM analysis suggested

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Attn:

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Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335
Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Description of Subsample	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
59069	18		18-1	1x1 Ceiling Tile/ white surfacing	y	None Detected		100% qu,bi
59069			18-2	tan ceiling tile	y	None Detected	100% ce	
59070	19		19-1	1x1 Ceiling Tile/ white surfacing	y	None Detected		100% qu,bi
59070			19-2	tan ceiling tile	y	None Detected	100% ce	
59071	20		20-1	Floor Tile, Mastic/ tan mastic	y	None Detected		100% gy,bi
59071			20-2	gray floor tile	y	3% Chrysotile		97% qu,ca
59071	7		20-3	black mastic with debris	n	<1% Chrysotile	2% ce	98% qu,gy,bi

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

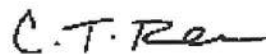
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ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
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or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst



Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

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Attn:

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Turnaround Time:
2 days

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Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335
Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Com ment	Layer #	Analysts Physical Description of Subsample	Homo-geneo us (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
59072	21		21-1	Floor Tile, Mastic/ tan mastic	y	None Detected		100% gy,bi
59072			21-2	gray floor tile	y	3% Chrysotile		97% qu,ca
59072	7		21-3	black mastic with debris	n	<1% Chrysotile	2% ce	98% qu,gy,bi
59073	22		22-1	Base Cove with Glue/ tan baseboard	y	None Detected		100% gy,ma
59073			22-2	tan mastic	y	None Detected		100% gy,bi
59074	23		23-1	Base Cove with Glue/ tan baseboard	y	None Detected		100% gy,ma
59074			23-2	tan mastic	y	None Detected		100% gy,bi

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

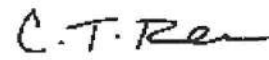
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:


Robert Olivarez
Analyst

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2. Fire Damage no significant fiber damages effecting fibrous percentages
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5. Not enough sample to analyze


Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

CA Labs
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Phone 225-751-5632
Fax 225-751-5634

Polarized Light Asbestiform Materials Characterization

Customer Info:
Badlands Env. Consultants
1008 East Central Avenue
Bismarck, ND 58501

Attn:

Customer Project:
P26-0213, 352 Main St. New
Town, ND 58763
Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335
Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Subsample	Description of	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
9x9 Floor Tile with Mastic/									
59075	24		24-1	tan mastic		y	None Detected		100% gy,bi
59075			24-2	red floor tile		y	3% Chrysotile		97% qu,ca
59075			24-3	black mastic		y	None Detected		100% gy,bi
9x9 Floor Tile with Mastic/									
59076	25		25-1	tan floor tile		y	3% Chrysotile		97% qu,ca
59076			25-2	black mastic		y	None Detected		100% gy,bi
1x1 Ceiling Tile/ off-white									
59077	26		26-1	surfacing		y	None Detected		100% qu,bi
59077			26-2	tan ceiling tile		y	None Detected	100% ce	

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

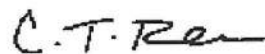
ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst

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5. Not enough sample to analyze



Tanner Rasmussen
Technical Manager

Julio Robles
Senior Analyst

6. Anthophyllite in association with Fibrous Talc
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9. < 1% Result point counted positive
10. TEM analysis suggested

CA Labs

Dedicated to Quality

Crisp Analytical, L.L.C.

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Polarized Light Asbestiform Materials Characterization**Customer Info:****Badlands Env. Consultants**

1008 East Central Avenue
Bismarck, ND 58501

Attn:

701-223-7335

Phone #

Fax #

Customer Project:

P26-0213, 352 Main St. New
Town, ND 58763

Turnaround Time:

2 days

CA Labs Project #:

CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Description of Subsample	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
1x1 Ceiling Tile/ gray								
59078	27		27-1	surfacing	y	None Detected		100% qu,bi
59078			27-2	tan ceiling tile	n	None Detected	100% ce	
Sheetrock and Taping Compound/ white surfaced								
59079	28		28-1	white compound	n	None Detected		100% qu,bi
59079			28-2	white drywall with brown paper	n	None Detected	23% ce	77% qu,gy
Base Cove with Glue/ gray								
59080	29		29-1	baseboard	y	None Detected		100% gy,ma
59080			29-2	tan mastic	y	None Detected		100% gy,bi
Base Cove with Glue/ gray								
59081	30		30-1	baseboard	y	None Detected		100% gy,ma

Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). All samples received in good condition unless noted.

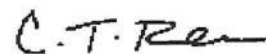
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ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot - other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:



Robert Olivarez
Analyst



Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

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5. Not enough sample to analyze

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9. < 1% Result point counted positive
10. TEM analysis suggested

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Polarized Light Asbestiform Materials Characterization

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Customer Project:
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Town, ND 58763
Turnaround Time:
2 days

CA Labs Project #:
CAL26064973AG

Date: 6/26/2026

Samples Rec'd: 6/24/26 10:30AM

Phone # 701-223-7335
Fax #

Date Of Sampling: 6/22/2026

Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts	Physical Description of Subsample	Homo-geneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
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59081			30-2	tan mastic		y	None Detected		100% gy,bi
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Dallas NVLAP Lab Code 200349-0 TEM/PLM TDSHS 30-0235

AIHA LAP, LLC Laboratory #102929

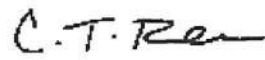
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Senior Analyst
Julio Robles

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Signature / Date / Time

BADLANDS ENVIRONMENTAL CONSULTANTS, INC.
1008 East Central Avenue, Bismarck, ND 58501
Phone: (701) 223-7335 FAX: (701) 223-7340

CA26064973

BULK ASBESTOS SAMPLING/CHAIN OF CUSTODY RECORD

Project Identification Number: P26-0213; 352 Main Street, New Town, ND 58763

Person Sampling: Nick Jangula

Turnaround Required: (circle one) 4 hour 24 hour 48 hour 2 day Standard 3 day

Sample No.	Sample Date	Material Description/Location	Friable (F) or Non-Friable (NF)
1	6-22-26	2'x4' ceiling tile (pinhole & valley) - middle storage area	
2		↓ of yellow glue L L ↓	
3		12'x12" floor tile - (white) - office area	
4		↓ L - L - ↓	
5		Plaster - ceiling above office area	
6		↓ Ceiling above main area	
7		- Break area - Exit way	
8		- Storage room - ↓	
9		↓ - office area - behind wayne's coating	
10		Sheetrock & Twp compound - main area	
11		↓ - Storage area	
12		2'x4' ceiling tile - office area	
13		↓ L ↓	

10:30 AM

Relinquished by

Date

6-22-26

Received By

Date 24 2026

Relinquished by

Date

Received By

Date

Andrew Sikes

CA 26064973

Project Identification Number: P26-0213; 352 Main Street, New Town, ND 58763

Turnaround Required:	(circle one)	4 hour	24 hour	48 hour	2 day Standard	3 day

10:30 AM

Date JUN 24 2026

Date _____

Andrew Sikors

Car 26664973

Project Identification Number: P26-0213; 352 Main Street, New Town, ND 58763

Turnaround Required:	(circle one)	4 hour	24 hour	48 hour	(2 day Standard)	3 day

10:30AM

Date JUN 24 2026

92.22.9)

Date _____

**SECTION 00 4000
PROCUREMENT FORMS AND SUPPLEMENTS**

PART 1 GENERAL**1.01 CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID LICENSE TO USE ALL COPYRIGHTED DOCUMENTS SPECIFIED BUT NOT INCLUDED IN THE PROJECT MANUAL.****1.02 FORMS**

- A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in the procurement requirements.
- B. Substitution Request Form (During Procurement): CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage).
- C. Bid Form:
 - 1. 00 4100 - Bid Form - General Contractor
 - 2. 00 4101 - Bid Form - Mechanical Contractor
 - 3. 00 4102 - Bid Form - Electrical Contractor
 - 4. 00 4103 - Bid Form - Combined Construction
- D. Procurement Form Supplements:
 - 1. Bid Security Form: AIA A310.
 - 2. Substitution Request Form: CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Stage).
 - 3. Proposed Schedule of Values Form: AIA G703.

1.03 REFERENCE STANDARDS

- A. AIA A310 - Bid Bond; 2010.
- B. AIA G703 - Continuation Sheet; 1992.
- C. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.
- D. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED**

END OF SECTION 00 4000

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BID FORM - GENERAL CONTRACTOR

TO: < *New Town American Legion* >

PROPOSED FOR: New Construction of <*New Town American Legion Restaurant*>

1.1 The undersigned understands and agrees to comply with and be bound by instructions to bidders issued for this Work.

1.2 The undersigned acknowledges receipt of Addendum numbers:

1.3 Enclosed with this bid is bid security in the amount of not less than 5% of the bidder's proposed Contract Sum including Add Alternates.

1.4 BASE BID

In accordance with the Invitation to Bid, the undersigned, having examined the proposed Contract Documents and having visited the site and examined the conditions affecting the Work, hereby proposes and agrees to furnish all labor, materials, equipment, and appliances, and to perform operations necessary to complete the Work as required by said proposed Contract Documents, for that portion of the Work identified as General construction.

I will do the General Construction Base Bid for the stipulated sum of:

_____ DOLLARS
(\$ _____)

1.5 ALLOWANCES: \$40,000 Contingency Allowance, to be included in the Base Bid above.

1.6 SUBCONTRACTOR LIST (GENERAL) < *EDIT AS NEEDED* >

List the Major subcontractors as shown below, if items are self-performed, list as such in the pertaining category.

Demo	_____
Structural Steel	_____
Concrete	_____
Metal Framing	_____
Painting	_____
Other	_____

1.7 In submitting this Bid, I agree:

- A. To hold my bid open for 30 calendar days after its opening.
- B. To accept the provisions of the Instructions to Bidders regarding Bid Security.
- C. To enter into, and execute a Contract, if awarded on the basis of this bid, and to furnish Performance-Payment Bonds in accordance with Instructions to Bidders.
- D. To accomplish the Work in accord with the Contract Documents including all submittals required.
- E. To complete the Work in the Base Bid and alternates as they apply, and ready for occupancy in _____ calendar days.

1.8. Bid dated this _____ day of _____ 20__.

1.9. Type of business entity:

(Corporation, co-partnership, individual, etc.)

Individual members of the firm:

President of Corporation _____

Secretary of Corporation _____

Corporation is organized under laws of the State of _____.

BIDDER:

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(CORPORATE SEAL)

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by _____

(typed name)

Address _____

License class & number _____

License issuance/renewal date _____

(Signature)

END OF SECTION 00 4100

BID FORM - MECHANICAL CONTRACTOR

TO: < *New Town American Legion* >

PROPOSED FOR: New Construction < *New Town American Legion Restaurant* >

1.1 The undersigned understands and agrees to comply with and be bound by instructions to bidders issued for this Work.

1.2 The undersigned acknowledges receipt of Addendum numbers:

1.3 Enclosed with this bid is bid security in the amount of not less than 5% of the bidder's proposed Contract Sum including Add Alternates.

1.4 BASE BID

In accordance with the Invitation to Bid, the undersigned, having examined the proposed Contract Documents and having visited the site and examined the conditions affecting the Work, hereby proposes and agrees to furnish all labor, materials, equipment, and appliances, and to perform operations necessary to complete the Work as required by said proposed Contract Documents, for that portion of the Work identified as Mechanical construction.

I will do the Mechanical Construction Base Bid for the stipulated sum of:

DOLLARS (\$ _____)

1.5 ALLOWANCES: \$20,000 Contingency Allowance to be included in Base Bid above.

1.6 SUBCONTRACTOR LIST (GENERAL) < *EDIT AS NEEDED* >

List the Major subcontractors as shown below, if items are self-performed, list as such in the pertaining category.

HVAC Equipment _____

Plumbing _____

Fire Protection _____

Other _____

1.7 In submitting this Bid, I agree:

- A. To hold my bid open for 30 calendar days after its opening.
- B. To accept the provisions of the Instructions to Bidders regarding Bid Security.
- C. To enter into, and execute a Contract, if awarded on the basis of this bid, and to furnish Performance-Payment Bonds in accordance with Instructions to Bidders.
- D. To accomplish the Work in accord with the Contract Documents including all submittals required.
- E. To complete the Work in the Base Bid and alternates as they apply, and ready for occupancy in _____ calendar days.

1.8 Bid dated this _____ day of _____ 20__.

1.9 Type of business entity:

(Corporation, co-partnership, individual, etc.)

Individual members of the firm:

President of Corporation _____

Secretary of Corporation _____

Corporation is organized under laws of the State of _____.

BIDDER:

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(CORPORATE SEAL)
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by _____
(typed name)
Address _____

License class & number _____
License issuance/renewal date _____

(Signature)

END OF SECTION 00 4101

BID FORM - ELECTRICAL CONTRACTOR

TO: < *New Town American Legion* >

PROPOSED FOR: New Construction of < *New Town American Legion Restaurant* >

1.1 The undersigned understands and agrees to comply with and be bound by instructions to bidders issued for this Work.

1.2 The undersigned acknowledges receipt of Addendum numbers:

1.3 Enclosed with this bid is bid security in the amount of not less than 5% of the bidder's proposed Contract Sum including Add Alternates.

1.4 BASE BID

In accordance with the Invitation to Bid, the undersigned, having examined the proposed Contract Documents and having visited the site and examined the conditions affecting the Work, hereby proposes and agrees to furnish all labor, materials, equipment, and appliances, and to perform operations necessary to complete the Work as required by said proposed Contract Documents, for that portion of the Work identified as Electrical construction.

I will do the Electrical Construction Base Bid for the stipulated sum of:

DOLLARS (\$ _____)

1.5 ALLOWANCES: *#10,000 Contingency Allowance to be included in the base bid above.*

1.6 SUBCONTRACTOR LIST (GENERAL) < *EDIT AS NEEDED* >

List the Major subcontractors as shown below, if items are self-performed, list as such in the pertaining category.

Fire Alarm _____

Lighting _____

Other _____

1.7 In submitting this Bid, I agree:

A. To hold my bid open for 30 calendar days after its opening.

- B. To accept the provisions of the Instructions to Bidders regarding Bid Security.
- C. To enter into, and execute a Contract, if awarded on the basis of this bid, and to furnish Performance-Payment Bonds in accordance with the Instructions to Bidders.
- C. To accomplish the Work in accord with the Contract Documents including all submittals required.
- E. To complete the Work in the Base Bid and alternates as they apply, and ready for occupancy in _____ calendar days.

1.8 Bid dated this _____ day of _____ 20__.

1.9 Type of business entity:

(Corporation, co-partnership, individual, etc.)

Individual members of the firm:

President of Corporation _____

Secretary of Corporation _____

Corporation is organized under laws of the State of _____.

BIDDER:

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(CORPORATE SEAL)
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()

by _____
(typed name)
Address _____

License class & number _____
License issuance/renewal date _____

(Signature)

END OF SECTION 00 4102

BID FORM - COMBINED CONTRACT

TO: < *New Town American Legion* >

PROPOSED FOR: New Construction of <*New Town American Legion Restaurant* >

1.1 The undersigned understands and agrees to comply with and be bound by instructions to bidders issued for this Work.

1.2 The undersigned acknowledges receipt of Addendum numbers:

1.3 Enclosed with this bid is bid security in the amount of not less than 5% of the bidder's proposed Contract Sum including Add Alternates.

1.4 BASE BID

In accordance with the Invitation to Bid, the undersigned, having examined the proposed Contract Documents and having visited the site and examined the conditions affecting the Work, hereby proposes and agrees to furnish all labor, materials, equipment, and appliances, and to perform operations necessary to complete the Work as required by said proposed Contract Documents, for that portion of the Work identified as General construction.

I will do the Combined Contract Base Bid for the stipulated sum of:

_____ DOLLARS
(\$ _____)

1.5 ALLOWANCES: \$60,000 *Contingency Allowance, to be included in the Base Bid above.*

1.6 SUBCONTRACTOR LIST (GENERAL) < *EDIT AS NEEDED* >

List the Major subcontractors as shown below, if items are self-performed, list as such in the pertaining category.

Demo	_____
Structural Steel	_____
Concrete	_____
Plumbing	_____
HVAC	_____
Electrical	_____

1.7 In submitting this Bid, I agree:

- A. To hold my bid open for 30 calendar days after its opening.
- B. To accept the provisions of the Instructions to Bidders regarding Bid Security.
- C. To enter into, and execute a Contract, if awarded on the basis of this bid, and to furnish Performance-Payment Bonds in accordance with Instructions to Bidders.
- D. To accomplish the Work in accord with the Contract Documents including all submittals required.
- E. To complete the Work in the Base Bid and alternates as they apply, and ready for occupancy in _____ calendar days.

1.8. Bid dated this _____ day of _____ 20__.

1.9. Type of business entity:

(Corporation, co-partnership, individual, etc.)

Individual members of the firm:

President of Corporation _____

Secretary of Corporation _____

Corporation is organized under laws of the State of _____.

BIDDER:

()

()

()

(CORPORATE SEAL)

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()

()

()

by _____

(typed name)

Address _____

License class & number _____

License issuance/renewal date _____

(Signature)

END OF SECTION 00 4100

**SECTION 00 5000
CONTRACTING FORMS AND SUPPLEMENTS**

PART 1 GENERAL**1.01 CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID LICENSE TO USE ALL COPYRIGHTED DOCUMENTS SPECIFIED BUT NOT INCLUDED IN THE PROJECT MANUAL.****1.02 AGREEMENT AND CONDITIONS OF THE CONTRACT**

- A. See Section 00 5200 - Agreement Form for the Agreement form to be executed.
- B. See Section 00 7200 - General Conditions for the General Conditions.
- C. See Section 00 7300 - Supplementary Conditions for the Supplementary Conditions.
- D. The Agreement is based on AIA A101.
- E. The General Conditions are based on AIA A201.

1.03 FORMS

- A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.
- B. Bond Forms:
 - 1. Bid Bond Form: AIA A310.
 - 2. Performance and Payment Bond Form: AIA A312.
- C. Post-Award Certificates and Other Forms:
 - 1. Schedule of Values Form: AIA G703.
 - 2. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).
- D. Clarification and Modification Forms:
 - 1. Substitution Request Form: CSI/CSC Form 1.5C (During the Bidding/Negotiating Stage).
 - 2. Substitution Request Form: CSI/CSC Form 13.1A (After the Bidding/Negotiating Stage).
 - 3. Architect's Supplemental Instructions Form: AIA G710.
 - 4. Construction Change Directive Form: AIA G714.
 - 5. Proposal Request Form: AIA G709.
 - 6. Change Order Form: AIA G701.
- E. Closeout Forms:
 - 1. Certificate of Substantial Completion Form: AIA G704.
 - 2. Contractor's Affidavit of Release of Liens Form: AIA G706A
 - 3. Consent of Surety to Final Payment Form: AIA G707.

1.04 REFERENCE STANDARDS

- A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.
- B. AIA A201 - General Conditions of the Contract for Construction; 2017.
- C. AIA A310 - Bid Bond; 2010.
- D. AIA A312 - Performance Bond and Payment Bond; 2010.
- E. AIA G701 - Change Order; 2017.
- F. AIA G702 - Application and Certificate for Payment; 1992.
- G. AIA G703 - Continuation Sheet; 1992.

- H. AIA G704 - Certificate of Substantial Completion; 2017.
- I. AIA G706A - Contractor's Affidavit of Release of Liens; 1994.
- J. AIA G707 - Consent of Surety to Final Payment; 1994.
- K. AIA G709 - Proposal Request; 2018.
- L. AIA G710 - Architect's Supplemental Instructions; 2017.
- M. AIA G714 - Construction Change Directive; 2017.
- N. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.
- O. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 5000

**SECTION 00 7200
GENERAL CONDITIONS**

FORM OF GENERAL CONDITIONS

**1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED
FOLLOWING THIS PAGE.**

RELATED REQUIREMENTS

2.01 SECTION 00 7300 - SUPPLEMENTARY CONDITIONS.

2.02 SECTION 01 4216 - DEFINITIONS.

SUPPLEMENTARY CONDITIONS

**3.01 REFER TO DOCUMENT 00 7300 - SUPPLEMENTARY CONDITIONS FOR
AMENDMENTS TO THESE GENERAL CONDITIONS.**

END OF SECTION 00 7200

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DRAFT AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

«EXAMPLE 2»

« »

THE OWNER:

(Name, legal status and address)

« »« »

« »

THE ARCHITECT:

(Name, legal status and address)

« »« »

« »

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| 7 | CHANGES IN THE WORK |
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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.

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

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

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

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

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

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

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

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

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

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

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

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

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

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

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

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

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

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

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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

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

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

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

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

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

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

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

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

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

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

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

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor’s control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor’s right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

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

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

SECTION 00 7300.10
SUPPLEMENTARY CONDITIONS - REGULAR SINGLE PRIME

PART 1 GENERAL

1.01 SUMMARY

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 72 00 - General Conditions and other provisions of the Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 RELATED SECTIONS

- A. Section 00 50 00 - Contracting Forms and Supplements.
- B. Section 00 52 00 - Agreement Form.
- C. Section 00 72 00 - General Conditions.
- D. Section 01 42 16 - Definitions.

1.03 MODIFICATIONS TO THE GENERAL CONDITIONS

ARTICLE 1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

Add the following:

- 1.1.3.1 The term "provide" shall mean furnish and install in place.
- 1.1.5.1 The general character and scope of the Work is shown by the Drawings. Where a portion of the Work is fully drawn and the remainder is merely indicated, the portion fully drawn shall apply to all similar parts of the Work.
- 1.1.5.2 Figured dimensions on the Drawings shall be followed in preference to scaled measurements on the Drawings.
- 1.1.6.1 Where Specifications are abbreviated type, they indicate complete sentences in the same manner as when a note occurs in the Drawings. Omissions of words such as "the Contractor shall" and "as shown on the Drawings" is intentional. The words "shall" or "shall be" are to be supplied by inference.
- 1.1.6.2 Where a number is listed in the Specifications (as for gauges, weights, temperatures, amounts of time, etc.), the number shall be interpreted as that or better.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following:

- 1.2.4 In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided.
- 1.2.5 As experienced Contractors and Subcontractors, it is assumed each Contractor and Subcontractor understands not all components may be shown on the Drawings including, but not limited to, fasteners, connectors and incidental supports. This shall not relieve the Contractors or Subcontractors from providing all materials, equipment, fasteners and incidental components as required or a complete installation in accordance with the design intent.

ARTICLE 3 - CONTRACTOR**3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR**

Modify the original paragraph as follows:

3.2.1 At the end of the sentence add “and geotechnical report, if any”.

3.4 LABOR AND MATERIALS

Add the following:

3.4.2.1 After the Contract has been executed, the Owner and Architect may consider requests for the substitution of products in place of those specified. The Owner and Architect may, but are not obligated to, consider only those substitution requests that are in full conformance with the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

- .1 represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to the product specified;
- .2 represents that it will provide the same warranty for the substitution as it would have provided for the product specified;
- .3 certifies that the cost data presented is complete and includes all related costs for the substituted product and for Work that must be performed or changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that subsequently become apparent;
- .4 agrees that it shall, if the substitution is approved, coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects; and
- .5 represents that the request includes a written representation identifying any potential effect the substitution may have on the Project's achievement of a Sustainable Measure or the Sustainable Objective.

3.4.4 No trade shall commence Work until conditions are satisfactory for carrying out the Work properly, and surfaces to be covered are suitable.

3.4.5 Manufacturer's printed instructions covering details of installation shall be followed where not in conflict with these Specifications. If there is a conflict, notify the Architect and obtain Architect's approval before proceeding.

3.4.6 Completed Work shall be left plumb, level, true to line or plane, anchored securely in place, and free from damage.

3.4.7 Unless otherwise called for, all pieces of material shall be as large a stock size as is in conformity with standard good practice of the trade.

3.4.8 Except where in conflict with the Specifications, current manufacturer's printed instructions of herein specified proprietary products are made part of the Specifications.

3.4.9 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.

3.4.10 The Contractor shall provide all incidental materials and components including, but not limited to, fasteners, connectors, incidental supports and other components of construction as required for complete installation in accordance with the design intent.

3.5 WARRANTY

Add the following:

3.5.1.1 The Contractor further warrants that all products, materials and equipment provided under the Contract are [asbestos-free] [zero percent Asbestos containing] as defined under current EPA Guidelines, and that they do not contain any other materials currently known to be hazardous.

3.7 PERMITS, FEES AND NOTICES

Add the following:

3.7.2.1 When the Contract Documents require Work better than that required by statute, the Contract Documents shall govern.

Modify the original paragraph as follows:

3.9.3 Replace second sentence with: The Contractor shall not change the superintendent during the progress of the project without the Owner's and Architect's written consent, which shall not unreasonably be withheld or delayed.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

Add the following:

3.10.1 Submit in accordance with Section 01 33 00.

Delete the following:

3.10.2 Delete the entire paragraph.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Add the following:

3.12.6.1 If the Contractor or any Subcontractor uses a material, product or piece of equipment which requires modification(s) to any other portion of the Work, including mechanical and electrical Work, the Contractor or Subcontractor using that material, product or piece of equipment shall be responsible for coordinating all required modifications and shall bear the full cost of such modifications.

3.15 CLEANING UP

Add the following:

3.15.1.1 The Contractor and Subcontractors shall clean all portions of the Work in accordance with Section 01 70 00 and as indicated on any punch lists. Final payment shall not be made until all cleaning has been accepted by the Architect.

ARTICLE 4 - ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

Modify the original paragraph:

4.2.3 Add sentence at end: The Architect will not be responsible for the acts or omissions of the Owner.

ARTICLE 5 - SUBCONTRACTORS

5.1 DEFINITIONS

Add the following:

5.1.3 All Subcontractors are bound to the terms of the General and Supplementary Conditions.

ARTICLE 7 - CHANGES IN THE WORK

Add the following:

7.1.4 All proposals shall, at a minimum, include detailed breakdown and indicate the terms enumerated below. Item (a) constitutes the cost of labor, and items (a), (b), and (c) constitute the basic costs referred to under this Article 7.

(a) Labor costs, itemized by each trade involved, showing the hourly rates for each, and the hours required for the change. Labor rates shall be the same for extra and credit computations and shall be the actual rate paid the workmen, plus contractor's burden on labor, which shall be only the actual costs of fringe benefits, taxes on labor, worker's or workmen's compensation, insurance on labor as affected by payroll, unemployment taxes and insurance, including FICA and FUTA.

(b) Quantities of materials, equipment and supplies, at their actual cost, with unit costs indicated, plus applicable sales tax.

(c) The cost of subcontracted work, computed in the same way as provided for under this subparagraph.

(d) Overhead, profit or commission added after the above computations are complete. Such overhead, profit or commission shall be computed in accordance with the provisions of subparagraph 7.1.5.

7.1.5 Maximum allowances for Subcontractor's/Contractor's overhead and profit shall be as follows, expressed as a percentage of the basic cost of the change:

For Subcontractors: a. 15% of the net cost of the additional Work.

For Contractors: b. 5% of the net cost of the additional Work performed by Subcontractors.

c. 15% of the net cost of the work performed by Contractor's own forces.

Add 5% to a and c for all changes of less than \$500.00, deduct 5% from a and c for all changes over \$10,000.00.

Overhead and profit shall include all bond premiums (if applicable), and will not be allowed on labor costs if overhead and profit is already included in hourly billing rate.

7.1.6 For proposed changes in the Work on the lump sum or time and material methods, the costs shall be determined as provided in this subparagraph. The Contractor shall submit an itemized list of quantities with the applicable unit costs and extended price for each, in such form and detail as required by the Architect.

7.2 CHANGE ORDERS

Add the following:

7.2.2 Neither the Owner nor the Architect are responsible to give Notice of Change Orders to the surety.

7.3 CONSTRUCTION CHANGE DIRECTIVES

Modify the original paragraph:

7.3.2 At the end of the sentence Add "or as deemed necessary by the Architect".

7.3.4 At the end of the first sentence replace "...a reasonable allowance for overhead and profit." with "...allowances for overhead and profit as indicated in 7.1.5."

ARTICLE 8 - TIME

8.1 DEFINITIONS

Add the following:

8.1.3.1 Minor corrective Work and the replacement of defective Work or materials, and the adjustment of control apparatus, will not delay the determination that the Contract is Substantially Complete.

8.1.3.2 The date of Final Completion is the date certified by the Architect in accordance with Paragraph 9.10.2.

8.2.1.1 The Date of Substantial Completion and the Date of Final Completion are as specified in Section [00 21 00] Instructions to Bidders. If the Work is not Substantially Complete on or before the date specified or other date as granted by Change Order, the Contractor shall pay to the Owner as liquidated damages the sum of \$ [] for each calendar day of delay. If the Work has not achieved Final Completion by the date specified or other date as granted by Change Order, the Contractor shall pay to the Owner as liquidated damages the sum of \$[] for each calendar day of delay. Any monies due to the Owner as liquidated damages will be deducted from any monies due or to become due to the Contractor under the Contract, or will be collected from the Contractor's surety. These sums are not to be construed in any sense as a penalty".

8.3 DELAYS AND EXTENSIONS OF TIME

Add the following:

8.3.1.1 The following will not be considered justifications for extension of time unless due to one of the causes stated within this Article 8:

(a) Delay caused by Subcontractors or Supplier except if the Supplier goes out of business and another Supplier cannot be found in time to meet the schedule.

(b) Shortage of workmen.

8.3.1.2 Change Orders for extension of Contract Time shall be considered only under the following conditions or circumstances:

.1 As indicated in Paragraph 8.3.1. The burden of proof to substantiate the extension of time shall rest with the Contractor, including evidence that the cause was beyond his control. The Contractor shall be deemed to have had control of the supply of labor (except in the case of organized labor disputes), materials, equipment, methods, and techniques, and of the Subcontractors.

.2 A delay in the progress of the Work actually occurred as a result of one of the valid causes for time extension.

.3 Unusual delay in delivery solely due to a delay in transportation. An extension of time shall not be considered when delay in delivery is due to improperly scheduled delivery, or when an order has not been promptly and properly placed.

.4 Abnormal weather conditions. The Contractor shall consider the location of the Project, and shall recognize the existence of variations from average climatic conditions. Foul weather in and of itself shall not be a valid cause for a time extension. Time extensions resulting from abnormal weather shall not be considered unless a significant deviation from average seasonal climatic conditions occurred for an extended period of time, and the progress of the Work was delayed to a significant extent. The climatic conditions before and after the period for which the delay is sought shall be evaluated.

.5 Changes in the Work which significantly affect the progress of the Work. When the anticipated delay can be determined the extension will be made when the Change in Work is authorized by the Owner. When the anticipated delay cannot be determined, the Contractor shall estimate the additional time required, and a mechanism for all parties to determine the allowable delay. In such a case, the Architect will determine the time extension and the Contract Time adjusted accordingly by Change Order. For changes in the Work which affect only a portion or Phase of the entire project, the Owner reserves the right to grant a time extension only for that portion or Phase affected by the Change.

.6 Labor disputes except for lockouts over which the Contractor has control. The amount of time extension shall not be longer than the actual dispute period plus a reasonable time for mobilization, and such extension may be less than the actual dispute period depending on the effect the dispute had upon the progress of the Work.

.7 Unavoidable delays such as damage caused by severe weather, fire or other casualty to the Work; remediation of contaminants, pollutants, or hazardous materials or substances discovered after award of the Contract; litigation including without limitation bankruptcy proceedings; the acts of any federal, state or local government unit that directly result in delays; and other delays outside the control of the Party claiming the delay.

.8 Delays caused by Subcontractors shall be considered only under the conditions noted above.

8.3.1.3 Time extensions shall not be granted as a result of delays caused by improper scheduling, or by failure of the Contractor to have Shop Drawings or other required submittals submitted in sufficient time for review.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

Modify the original paragraph:

9.1.2 Add sentence at end: "The costs for overhead, profit and commission shall be determined in accordance with the provisions of subparagraph 7.1.5."

9.3 APPLICATIONS FOR PAYMENT

9.3.4 Progress payments shall be made monthly upon application, in the amount of 90% of the Work completed and materials described under 9.3.2. For a Contract of over \$100 thousand, the Architect may authorize the payment of 100% of the amount completed after a total of 5% of the Contract amount has been retained, providing progress on the Work is in accordance with or ahead of the Contractor's construction schedule and is satisfactory to the Architect and if the Contractor has filed a Consent of Surety with the Architect.

9.8 SUBSTANTIAL COMPLETION

Add the following:

9.8.1 Minor corrective Work, the replacement of defective Work or materials, and the adjustment of control apparatus will not delay the determination of Substantial Completion.

9.8.2 Minor punch list items that do not interfere with using the Work as intended may be corrected between Substantial Completion and Final Completion.

9.10 FINAL COMPLETION AND FINAL PAYMENT

Modify the original paragraph as follows:

9.10.2 After "...or Subcontractor warranties," DELETE "and (6)" and REPLACE WITH ";(6) written certification from Contractor in accordance with Final Inspection requirements of [Section 01 77 00], (7) all Contract Closeout submittals required by [Section 01 78 00], each submittal having been approved by the Architect, and (8)".

ARTICLE 10 - PROTECTION OF PERSONS & PROPERTY

10.3 HAZARDOUS MATERIALS

Modify the original paragraph as follows:

10.3.1 In the second sentence add "lead-containing materials" after "asbestos".

ARTICLE 11 - INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE AND BONDS

11.1.2 Replace the first sentence with: The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required in the Agreement or elsewhere in the Contract Documents, covering the faithful performance of the Contract and the payments of all obligations arising thereunder.

11.1.3 Replace paragraph with: The Contract will not be executed by the Owner until the Owner has received, from the Contractor, the properly executed surety bonds specified in AIA A101-2017 Exhibit A Insurance and Bonds.

11.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSS

Modify the original paragraph as follows:

11.5.1 At the end of the first sentence add: "except when the fiduciary consents to allow a party with a claim to settle directly with the insurer."

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

No supplement.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

No supplement.

13.6 TAX CLEARANCE

Add the following:

13.6.1 The Contract will not be signed by the Owner until the Contractor has obtained an income tax clearance, and Workmen's Compensation certificate from the North Dakota State Tax Department and submitted it with the Contract and other supporting documents to the Owner. Certificates must be current and must not have expired as of the date of the contracts are submitted for approval.

13.7 SAFETY PROGRAMS

Add the following:

13.7.1 For all projects exceeding \$100,000, the [Contractor] [Contractors] shall submit to the Owner a copy of the written safety program to be used as guidelines and direction of the subcontractors worksite activities.

13.7.2 It shall be a condition of the Contract, and shall be made a condition of each Subcontract entered into pursuant to the Contract, that the Owner assumes no liability relating to its receipt and review of the Contractor's safety program. Safety remains the responsibility of the [Contractor] [Contractors]. Furthermore, the right of the Owner to receive and review the safety program shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the [Contractor] [Contractors] or any other person or entity.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT**14.2 TERMINATION BY THE OWNER FOR CAUSE**

Modify the original paragraph as follows:

14.2.1.2 At the end of the Subparagraph, before semi-colon, Add "or in accordance with the Contract Documents".

Add the following:

14.2.1.5 files a bankruptcy petition or has a bankruptcy action commenced against it that is not discharged within 30 days of commencement of same, makes an assignment for the benefit of its creditors, has a receiver appointed to manage the Contractor's assets or otherwise becomes insolvent;

14.2.1.6 fails to maintain schedules as required by the Contract Documents, or fails to comply in a material way with design requirements of the Contract Documents, or persistently fails to perform the Work in accordance with the Contract Documents.

Modify the original paragraph as follows:

14.2.4 Replace paragraph with: If the unpaid balance of the Contract Sum exceeds the direct and indirect consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs), and other damages incurred by the Owner, such excess will be paid to the Contractor. If such costs and damages exceed such unpaid balance, the Contractor shall pay the difference to the Owner. Such costs incurred by the Owner will be approved as to reasonableness by the Architect, but when exercising any rights or remedies under this paragraph, the Owner shall not be required to obtain the lowest price for the Work performed. This obligation to payment shall survive termination of the Contract.

ARTICLE 15 - CLAIMS AND DISPUTES

Add paragraphs 15.1.6.3 and 15.1.6.4 for SINGLE PRIME Projects, with or without Liquidated Damages, and advisable for use on projects which require Critical Path method of scheduling in Division 1.

Add the following:

15.1.6.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work, and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

15.1.6.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

AIA DOCUMENT A101-2017 EXHIBIT A

ARTICLE A.1 – GENERAL

Add: Reference to “all-risks” in this document shall mean builder’s risk policy.

ARTICLE A.2 – OWNER’S INSURANCE

A.2.3 REQUIRED PROPERTY INSURANCE

Modify the original paragraph as follows:

A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Architect, Engineers Contractor, Subcontractors, and Sub subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees. This insurance is not intended to cover machinery, tools or equipment owned or rented by the Contractor that are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage per Article A.3.3.2.5 for owned or rented machinery, tools or equipment which shall be subject to the provisions of the General Conditions, Article 11.3 Waivers of Subrogation.

ARTICLE A.3 - CONTRACTOR'S INSURANCE AND BONDS

A.3.1 General

Modify the original paragraph as follows:

A.3.1.1 Replace the third sentence with: The certificates will show the Owner and Architect as additional insured on the Contractor's Commercial General Liability and umbrella liability policy or policies.

Add the following paragraph:

A.3.1.1.1 Proof of workmen's compensation insurance coverage shall be a copy of certificate of premium payment and proof of other insurance coverage shall be fully descriptive standard AIA or ACCORD Certificate of Insurance. The Certificate of Insurance portrays the Insurance Agent's description of coverages provided the Contractor.

A.3.2 Contractor's Required Insurance Coverage

A.3.2.1 Add: The Architect and Owner assume no responsibility in the event that the limits set below are not adequate.

A.3.3 Contractor's Other Insurance Coverage

A.3.3.2.1 In fifth sentence replace "Owner" with "[General] Contractor". See Article 11.5 of both the General Conditions and Section 07 30 00 Supplementary Conditions for additional information.

Add the following paragraphs:

A.3.3.2.1.1 If the Owner is damaged by the failure of the [General] Contractor to maintain this insurance, then the [General] Contractor shall bear all reasonable costs properly attributable thereto.

A.3.3.2.4 Add: The Contractor shall provide this insurance if storing materials and equipment off-site. See article 9.3.2 of the General Conditions and Section 00 73 00 Supplementary Conditions for additional requirements relating to materials or equipment stored off-site.

A.3.4 Performance Bond and Payment Bond

Delete second paragraph beginning "Payment and Performance Bonds..." and add:

A.3.4.1 Where there are State, Federal or other jurisdictional bond forms required by statute or regulation, the bond or bonds shall be on those forms, in the amount of 100% of the Contract amount. Where no such requirements exist, the Contractor shall furnish both AIA A312 Performance and AIA A312 Labor and Material Payment Bond, current as of the date of the agreement. Each bond, Performance and Payment shall be in the amount of 100% of the Contract amount.

A.3.4.2 The Contractor shall require the attorney-in-fact who executes the required surety bonds on behalf of the surety to affix thereto a certified and correct copy of the power of attorney.

A.3.4.3 Bond amounts shall not exceed the single bond limit for the Contractor's bonding company as set forth in the Federal Register current as of the bid date.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED**

END OF SECTION 00 7300.10

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SECTION 00 7300.20
SUPPLEMENTARY CONDITIONS – REGULAR MULTIPLE PRIME

PART 1 GENERAL

1.01 SUMMARY

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 72 00 - General Conditions and other provisions of the Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 RELATED SECTIONS

- A. Section 00 50 00 - Contracting Forms and Supplements.
- B. Section 00 52 00 - Agreement Form.
- C. Section 00 72 00 - General Conditions.
- D. Section 01 42 16 - Definitions.

1.03 MODIFICATIONS TO THE GENERAL CONDITIONS

ARTICLE 1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

Add the following:

1.1.3.1 The term "provide" shall mean furnish and install in place.

1.1.5.1 The general character and scope of the Work is shown by the Drawings. Where a portion of the Work is fully drawn and the remainder is merely indicated, the portion fully drawn shall apply to all similar parts of the Work.

1.1.5.2 Figured dimensions on the Drawings shall be followed in preference to scaled measurements on the Drawings.

1.1.6.1 Where Specifications are abbreviated type, they indicate complete sentences in the same manner as when a note occurs in the Drawings. Omissions of words such as "the Contractor shall" and "as shown on the Drawings" is intentional. The words "shall" or "shall be" are to be supplied by inference.

1.1.6.2 Where a number is listed in the Specifications (as for gauges, weights, temperatures, amounts of time, etc.), the number shall be interpreted as that or better.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following:

1.2.4 In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided.

1.2.5 As experienced Contractors and Subcontractors, it is assumed each Contractor and Subcontractor understands not all components may be shown on the Drawings including, but not limited to, fasteners, connectors and incidental supports. This shall not relieve the Contractors or Subcontractors from providing all materials, equipment, fasteners, and incidental components as required or a complete installation in accordance with the design intent.

ARTICLE 3 - CONTRACTOR**3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR**

Modify the original paragraph as follows:

3.2.1 At the end of the sentence add “and geotechnical report, if any”.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following:

3.3.1.1 The General Contractor's schedule, prepared in accordance with Article 3.10.1 of these Supplementary Conditions, and progress of the Work shall govern the Work of the contractor. The General Contractor shall be responsible for the general coordination of the Work of all contractors with respect to the current construction schedule in order to maintain the progress of the Work and to ensure the progress remains on schedule as if the General Contractor were the single Prime Contractor. Each Contractor shall notify the other contractors, within a reasonable time, of phases or items of the Work requiring incorporation of Work by the other contractors. The other contractors shall, after such notification and within a reasonable time, proceed with furnishing, installing, laying out or incorporating their Work so as not to delay or impede the progress of the other contractors and the Work. Neither the Owner nor the Architect shall be responsible for the coordination of the Work between the Contractors.

3.3.1.2 Each Contractor shall be responsible for the regular and on-going coordination of their Work with the affected Work of other Contractors, and for maintaining and coordinating the progress of the Work in accordance with the construction schedule, prepared in accordance with Article 3.10.1 of these Supplementary Conditions for schedule requirements.

3.4 LABOR AND MATERIALS

Add the following:

3.4.2.1 After the Contract has been executed, the Owner and Architect may consider requests for the substitution of products in place of those specified. The Owner and Architect may, but are not obligated to, consider only those substitution requests that are in full conformance with the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

- .1 represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to the product specified;
- .2 represents that it will provide the same warranty for the substitution as it would have provided for the product specified;
- .3 certifies that the cost data presented is complete and includes all related costs for the substituted product and for Work that must be performed or changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that subsequently become apparent;
- .4 agrees that it shall, if the substitution is approved, coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects; and

.5 represents that the request includes a written representation identifying any potential effect the substitution may have on the Project's achievement of a Sustainable Measure or the Sustainable Objective.

3.4.4 No trade shall commence Work until conditions are satisfactory for carrying out the Work properly, and surfaces to be covered are suitable.

3.4.5 Manufacturer's printed instructions covering details of installation shall be followed where not in conflict with these Specifications. If there is a conflict, notify the Architect and obtain Architect's approval before proceeding.

3.4.6 Completed Work shall be left plumb, level, true to line or plane, anchored securely in place, and free from damage.

3.4.7 Unless otherwise called for, all pieces of material shall be as large a stock size as is in conformity with standard good practice of the trade.

3.4.8 Except where in conflict with the Specifications, current manufacturer's printed instructions of herein specified proprietary products are made part of the Specifications.

3.4.9 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.

3.4.10 The Contractor shall provide all incidental materials and components including, but not limited to, fasteners, connectors, incidental supports and other components of construction as required for complete installation in accordance with the design intent.

3.5 WARRANTY

Add the following:

3.5.1.1 The Contractor further warrants that all products, materials and equipment provided under the Contract are asbestos-free as defined under current EPA Guidelines, and that they do not contain any other materials currently known to be hazardous.

3.7 PERMITS, FEES AND NOTICES

Modify the original paragraph:

3.7.1 Replace the text with: The General Contractor shall secure and pay for the building permit. The cost of which is figured on the total construction cost, including Mechanical and Electrical Work. In bidding, the General Contractor shall include cost on an amount equal to 100% of his Bid plus all add Alternates, and 45% of this amount for other Contracts. The Contract amount shall be adjusted for difference between this estimated cost and the actual cost of the permit.

Add the following:

3.7.2.1 When the Contract Documents require Work better than that required by statute, the Contract Documents shall govern.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

Modify the original paragraph:

3.10.1 Replace the text with: The General Contractor's, promptly after being awarded the Contract, and in cooperation with other Prime Contractors, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work, and shall submit to the Architect written evidence of the other Prime Contractor's concurrence with that schedule. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestones dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under Contract Documents. The schedule shall be revised at appropriated intervals as required by the conditions of the Work and Project. Submit in accordance with Section 01 33 00. The first payment will not be certified by the Architect until the construction schedule has been received by the Architect.

Delete the following:

3.10.2 Delete the entire paragraph.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Add the following:

3.12.6.1 If the Contractor or any Subcontractor uses a material, product or piece of equipment which requires modification(s) to any other portion of the Work, including mechanical and electrical Work, the Contractor or Subcontractor using that material, product or piece of equipment shall be responsible for coordinating all required modifications and shall bear the full cost of such modifications.

3.15 CLEANING UP

Add the following:

3.15.1.1 The Contractor and Subcontractors shall clean all portions of the Work in accordance with Section 01 7000 and as indicated on any punch lists. Final payment shall not be made until all cleaning has been accepted by the Architect.

ARTICLE 4 - ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

Modify the original paragraph:

4.2.3 Add sentence at end: The Architect will not be responsible for the acts or omissions of the Owner.

ARTICLE 5 - SUBCONTRACTORS

5.1 DEFINITIONS

Add the following:

5.1.3 All Subcontractors are bound to the terms of the General and Supplementary Conditions.

ARTICLE 7 - CHANGES IN THE WORK

Add the following:

7.1.4 All proposals shall, at a minimum, include detailed breakdown and indicate the terms enumerated below. Item (a) constitutes the cost of labor, and items (a), (b), and (c) constitute the basic costs referred to under this Article 7.

(a) Labor costs, itemized by each trade involved, showing the hourly rates for each, and the hours required for the change. Labor rates shall be the same for extra and credit computations and shall be the actual rate paid the workmen, plus contractor's burden on labor, which shall be only the actual costs of fringe benefits, taxes on labor, worker's or workmen's compensation, insurance on labor as affected by payroll, unemployment taxes and insurance, including FICA and FUTA.

(b) Quantities of materials, equipment and supplies, at their actual cost, with unit costs indicated, plus applicable sales tax.

(c) The cost of subcontracted work, computed in the same way as provided for under this subparagraph.

(d) Overhead, profit or commission added after the above computations are complete. Such overhead, profit or commission shall be computed in accordance with the provisions of subparagraph 7.1.5.

7.1.5 Maximum allowances for Subcontractor's/Contractor's overhead and profit shall be as follows, expressed as a percentage of the basic cost of the change:

For Subcontractors a. 15% of the net cost of the additional Work.

For Contractor: b. 5% of the net cost of the additional Work performed by Subcontractors.

c. 15% of the net cost of the work performed by Contractor's own forces.

5% Add 5% to a and c for all changes of less than \$500.00, deduct from a and c for all changes over \$10,000.00.

Overhead and profit shall include all bond premiums (if applicable), and will not be allowed on labor costs if overhead and profit is already included in hourly billing rate.

7.1.6 For proposed changes in the Work on the lump sum or time and material methods, the costs shall be determined as provided in this subparagraph. The Contractor shall submit an itemized list of quantities with the applicable unit costs and extended price for each, in such form and detail as required by the Architect.

7.2 CHANGE ORDERS

Add the following:

7.2.2 Neither the Owner nor the Architect are responsible to give Notice of Change Orders to the surety.

7.3 CONSTRUCTION CHANGE DIRECTIVES

Modify the original paragraph:

7.3.2 At the end of the sentence Add "or as deemed necessary by the Architect".

7.3.4 At the end of the first sentence replace "...a reasonable allowance for overhead and profit." with "...allowances for overhead and profit as indicated in 7.1.5."

ARTICLE 8 - TIME

8.1 DEFINITIONS

Add the following:

8.1.3.1 Minor corrective Work and the replacement of defective Work or materials, and the adjustment of control apparatus, will not delay the determination that the Contract is Substantially Complete.

8.1.3.2 The date of Final Completion is the date certified by the Architect in accordance with Paragraph 9.10.2.

8.3 DELAYS AND EXTENSIONS OF TIME

Add the following:

8.3.1.1 The following will not be considered justifications for extension of time unless due to one of the causes stated within this Article 8:

(a) Delay caused by Subcontractors or Supplier except if the Supplier goes out of business and another Supplier cannot be found in time to meet the schedule.

(b) Shortage of workmen.

8.3.1.2 Change Orders for extension of Contract Time shall be considered only under the following conditions or circumstances:

.1 As indicated in Paragraph 8.3.1. The burden of proof to substantiate the extension of time shall rest with the Contractor, including evidence that the cause was beyond his control. The Contractor shall be deemed to have had control of the supply of labor (except in the case of organized labor disputes), materials, equipment, methods, and techniques, and of the Subcontractors.

.2 A delay in the progress of the Work actually occurred as a result of one of the valid causes for time extension.

.3 Unusual delay in delivery solely due to a delay in transportation. An extension of time shall not be considered when delay in delivery is due to improperly scheduled delivery, or when an order has not been promptly and properly placed.

.4 Abnormal weather conditions. The Contractor shall consider the location of the Project, and shall recognize the existence of variations from average climatic conditions. Foul weather in and of itself shall not be a valid cause for a time extension. Time extensions resulting from abnormal weather shall not be considered unless a significant deviation from average seasonal climatic conditions occurred for an extended period of time, and the progress of the Work was delayed to a significant extent. The climatic conditions before and after the period for which the delay is sought shall be evaluated.

.5 Changes in the Work which significantly affect the progress of the Work. When the anticipated delay can be determined the extension will be made when the Change in Work is authorized by the Owner. When the anticipated delay cannot be determined, the Contractor shall estimate the additional time required, and a mechanism for all parties to determine the allowable delay. In such a case, the Architect will determine the time extension and the Contract Time adjusted accordingly by Change Order. For changes in the Work which affect only a portion or Phase of the entire project, the Owner reserves the right to grant a time extension only for that portion or Phase affected by the Change.

.6 Labor disputes except for lockouts over which the Contractor has control. The amount of time extension shall not be longer than the actual dispute period plus a reasonable time for mobilization, and such extension may be less than the actual dispute period depending on the effect the dispute had upon the progress of the Work.

.7 Unavoidable delays such as damage caused by severe weather, fire or other casualty to the Work; remediation of contaminants, pollutants, or hazardous materials or substances discovered after award of the Contract; litigation including without limitation bankruptcy proceedings; the acts of any federal, state or local government unit that directly result in delays; and other delays outside the control of the Party claiming the delay.

.8 Delays caused by Subcontractors shall be considered only under the conditions noted above.

8.3.1.3 Time extensions shall not be granted as a result of delays caused by improper scheduling, or by failure of the Contractor to have Shop Drawings or other required submittals submitted in sufficient time for review.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

Modify the original paragraph:

9.1.2 Add sentence at end: "The costs for overhead, profit and commission shall be determined in accordance with the provisions of subparagraph 7.1.5."

9.3 APPLICATIONS FOR PAYMENT

9.3.4 Progress payments shall be made monthly upon application, in the amount of 90% of the Work completed and materials described under 9.3.2. For a Contract of over \$100 thousand, the Architect may authorize the payment of 100% of the amount completed after a total of 5% of the Contract amount has been retained, providing progress on the Work is in accordance with or ahead of the Contractor's construction schedule and is satisfactory to the Architect and if the Contractor has filed a Consent of Surety with the Architect.

9.8 SUBSTANTIAL COMPLETION

Add the following:

9.8.1 Minor corrective Work, the replacement of defective Work or materials, and the adjustment of control apparatus will not delay the determination of Substantial Completion.

9.8.2 Minor punch list items that do not interfere with using the Work as intended may be corrected between Substantial Completion and Final Completion.

9.10 FINAL COMPLETION AND FINAL PAYMENT

Modify the original paragraph as follows:

9.10.2 After "...or Subcontractor warranties," DELETE "and (6)" and REPLACE WITH ",(6) written certification from Contractor in accordance with Final Inspection requirements of [Section 01 77 00], (7) all Contract Closeout submittals required by [Section 01 78 00], each submittal having been approved by the Architect, and (8)".

ARTICLE 10 - PROTECTION OF PERSONS & PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following:

10.2.8 The General Contractor shall be responsible for overall security on the project site, including securing fencing required by Section 01 50 00, and securing doors, windows and other access points to the building at the end of each work day. Any Work being performed during nights or on weekends shall be coordinated with the General Contractor so that the General Contractor may take any steps he deems necessary to ensure the site is secure when that Work is suspended for the day and that it remains secured until work commences again.

10.3 HAZARDOUS MATERIALS

Modify the original paragraph as follows:

10.3.1 In the second sentence add “lead-containing materials” after “asbestos”.

ARTICLE 11 - INSURANCE AND BONDS

11.1 CONTRACTOR’S INSURANCE AND BONDS

11.1.2 Replace the first sentence with: Each Prime Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required in the Agreement or elsewhere in the Contract Documents, covering the faithful performance of the Contract and the payments of all obligations arising thereunder.

11.1.3 Replace paragraph with: The Contract will not be executed by the Owner until the Owner has received, from Each Prime Contractor, the properly executed surety bonds specified in AIA A101-2017 Exhibit A Insurance and Bonds.

11.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSS

A. _____

Modify the original paragraph as follows:

11.5.1 At the end of the first sentence add: “except when the fiduciary consents to allow a party with a claim to settle directly with the insurer.

B. _____

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

No supplement.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

No supplement.

C. _____

13.6 TAX CLEARANCE

Add the following:

13.6.1 The Contract will not be signed by the Owner until the Contractor has obtained an income tax clearance, and Workmen’s Compensation certificate from the North Dakota State Tax Department and submitted it with the Contract and other supporting documents to the Owner. Certificates must be current and must not have expired as of the date of the contracts are submitted for approval.

13.7 SAFETY PROGRAMS

Add the following:

13.7.1 For all projects exceeding \$100,000, the [Contractor] [Contractors] shall submit to the Owner a copy of the written safety program to be used as guidelines and direction of the subcontractors worksite activities.

13.7.2 It shall be a condition of the Contract, and shall be made a condition of each Subcontract entered into pursuant to the Contract, that the Owner assumes no liability relating to its receipt and review of the Contractor's safety program. Safety remains the responsibility of the [Contractor] [Contractors]. Furthermore, the right of the Owner to receive and review the safety program shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the [Contractor] [Contractors] or any other person or entity.

D. _____

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

14.2 TERMINATION BY THE OWNER FOR CAUSE

Modify the original paragraph as follows:

14.2.1.2 At the end of the Subparagraph, before semi-colon, Add "or in accordance with the Contract Documents".

Add the following:

14.2.1.5 files a bankruptcy petition or has a bankruptcy action commenced against it that is not discharged within 30 days of commencement of same, makes an assignment for the benefit of its creditors, has a receiver appointed to manage the Contractor's assets or otherwise becomes insolvent;

14.2.1.6 fails to maintain schedules as required by the Contract Documents, or fails to comply in a material way with design requirements of the Contract Documents, or persistently fails to perform the Work in accordance with the Contract Documents.

Modify the original paragraph as follows:

14.2.4 Replace paragraph with: If the unpaid balance of the Contract Sum exceeds the direct and indirect consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs), and other damages incurred by the Owner, such excess will be paid to the Contractor. If such costs and damages exceed such unpaid balance, the Contractor shall pay the difference to the Owner. Such costs incurred by the Owner will be approved as to reasonableness by the Architect, but when exercising any rights or remedies under this paragraph, the Owner shall not be required to obtain the lowest price for the Work performed. This obligation to payment shall survive termination of the Contract.

ARTICLE 15 - CLAIMS AND DISPUTES

REFERENCE STANDARDS

AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.

AIA A312 - Performance Bond and Payment Bond; 2010.

AIA DOCUMENT A101-2017 EXHIBIT A

ARTICLE A.1 - GENERAL

Add: Reference to "all-risks" in this document shall mean builder's risk policy.

ARTICLE A.2 – OWNER’S INSURANCE**A.2.3 REQUIRED PROPERTY INSURANCE**

Modify the original paragraph as follows:

A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Architect, Engineers Contractor, Subcontractors, and Sub subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees. This insurance is not intended to cover machinery, tools or equipment owned or rented by the Contractor that are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage per Article A.3.3.2.5 for owned or rented machinery, tools or equipment which shall be subject to the provisions of the General Conditions, Article 11.3 Waivers of Subrogation.

ARTICLE A.3 - CONTRACTOR’S INSURANCE AND BONDS**A.3.1 General**

Modify the original paragraph as follows:

A.3.1.1 Replace the third sentence with: The certificates will show the Owner and Architect as additional insured on the Contractor’s Commercial General Liability and umbrella liability policy or policies.

Add the following paragraph:

A.3.1.1.1 Proof of workmen’s compensation insurance coverage shall be a copy of certificate of premium payment and proof of other insurance coverage shall be fully descriptive standard AIA or ACCORD Certificate of Insurance. The Certificate of Insurance portrays the Insurance Agent’s description of coverages provided the Contractor.

A.3.2 Contractor's Required Insurance Coverage

A.3.2.1 Add: The Architect and Owner assume no responsibility in the event that the limits set below are not adequate.

A. Contractor’s Other Insurance Coverage

- A. A.3.3.2.1 In fifth sentence replace “Owner” with “[General] Contractor”. See Article 11.5 of both the General Conditions and Section 07 30 00 Supplementary Conditions for additional information.

- B. Add the following paragraphs:

A.3.3.2.1.1 If the Owner is damaged by the failure of the [General] Contractor to maintain this insurance, then the [General] Contractor shall bear all reasonable costs properly attributable thereto.

A.3.3.2.1.2 In bidding, the [General] Contractor shall include the property insurance premium on an amount equal to 100% of his bid plus all his add alternates, plus [45% of this amount for other Contracts including plus] the portion of Architect's fee in connection with any loss. The Contract amount shall be adjusted for the "difference" between the premium on this estimated amount and the actual amount. The Contract will not be signed until the Owner has received from the General Contractor the proper policy and one copy thereof for insurance specified under this Article.

A.3.3.2.4 Add: The Contractor shall provide this insurance if storing materials and equipment off-site. See article 9.3.2 of the General Conditions and Section 00 73 00 Supplementary Conditions for additional requirements relating to materials or equipment stored off-site.

A.3.4 Performance Bond and Payment Bond

Delete second paragraph beginning "Payment and Performance Bonds..." and add:

A.3.4.1 Where there are State, Federal or other jurisdictional bond forms required by statute or regulation, the bond or bonds shall be on those forms, in the amount of 100% of the Contract amount. Where no such requirements exist, the Contractor shall furnish both AIA A312 Performance and AIA A312 Labor and Material Payment Bond, current as of the date of the agreement. Each bond, Performance and Payment shall be in the amount of 100% of the Contract amount.

A.3.4.2 The Contractor shall require the attorney-in-fact who executes the required surety bonds on behalf of the surety to affix thereto a certified and correct copy of the power of attorney.

A.3.4.3 Bond amounts shall not exceed the single bond limit for the Contractor's bonding company as set forth in the Federal Register current as of the bid date.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 7300.20

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**SECTION 01 1000
SUMMARY****PART 1 GENERAL****1.01 PROJECT**

- A. Project Name: New Town American Legion.
- B. Owner's Name: Beck-Sherven-Foreman -American Legion Post Number 290.
- C. Architect's Name: ICON Architectural Group.
- D. Additional Project contact information is specified in Section 00 0103 - Project Directory.
- E. The Project consists of the construction of a Restaurant/Bar including major remodel of a 3,700 SF existing building as well as a 4,600 SF addition..

1.02 CONTRACT DESCRIPTION

- A. Contract Type: Multiple prime contracts, each based on a Stipulated Price as described in Document 00 5000 - Contracting Forms and Supplements.
- B. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 5200 - Agreement Form.
- C. The work of each separate prime contract is identified in this section and on Drawings.

1.03 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 4100.
- B. Scope of alterations work is indicated on drawings.

1.04 WORK BY OWNER

- A. Owner will supply the following for installation by Contractor:
 - 1. Toilet Paper Dispensers.
 - 2. Soap Dispensers.
 - 3. Sanitary Napkin Dispensers.
 - 4. Paper Towel Dispensers.
 - 5. Asbestos Abatement of VCT Flooring
 - 6. Other as indicated on the drawings.

1.05 OWNER OCCUPANCY

- A. Owner intends to continue to occupy the Basement portions of the existing building during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: _____.
 - 1. Locate and conduct construction activities in ways that will limit disturbance to site.
- B. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.

C. Utility Outages and Shutdown:

1. Prevent accidental disruption of utility services to other facilities.

1.07 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner.

1.08 SPECIFICATION SECTIONS APPLICABLE TO EVERY CONTRACT

- A. Unless otherwise noted, provisions of the sections listed below apply to every contract.
Specific items of work listed under individual contract descriptions constitute exceptions.
- B. Section 00 0103 - Project Directory.
- C. Section 01 2000 - Price and Payment Procedures.
- D. Section 01 2500 - Substitution Procedures.
- E. Section 01 4000 - Quality Requirements.
- F. Section 01 7000 - Execution and Closeout Requirements.
- G. Section 01 7800 - Closeout Submittals.

1.09 CONTRACT NO. 01 - GENERAL CONSTRUCTION

- A. Division 01 - General Requirements:
1. Specification sections listed above.
 2. Section 01 7000: Basic project engineering and layout.
 3. Section 01 5000: Utility services to point of delivery indicated, and installation of meters.
 4. Section 01 5000: Payment of costs of temporary utilities and services consumed.
 5. Section 01 5000: Temporary heating, cooling, and ventilating.
 6. Section 01 5000: Provide debris receptacles, remove debris from site.
 7. Section 01 5000: Erosion control structures.
 8. Section 01 7000: Temporary water control.
 9. Section 01 7000: Final cleaning.
- B. Provide all Work except Work specifically assigned to other contractors in this Section.

1.10 CONTRACT NO. 02A - PLUMBING

- A. Specification sections listed above as applicable to every contract.
- B. Division 21: Fire Suppression
- C. Division 22 - Plumbing: Every section included in Project Manual.

1.11 CONTRACT NO. 02B - HEATING, VENTILATING, AND AIR CONDITIONING

- A. Specification sections listed above as applicable to every contract.
- B. Division 23 - Heating, Ventilating, and Air Conditioning: Every section included in Project Manual.

1.12 CONTRACT NO. 03 - ELECTRICAL

- A. Specification sections listed above as applicable to every contract.
- B. Division 26 - Electrical: Every section included in Project Manual.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 1000

**SECTION 01 1200
MULTIPLE CONTRACT SUMMARY**

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

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

1.02 SUMMARY

- A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.
- B. Specific requirements for Work of each contract are also indicated in individual Specification Sections and on Drawings.
- C. Related Requirements:
 - 1. Section 01 1000 "Summary" for the Work covered by the Contract Documents, restrictions on use of Project site,[phased construction,] coordination with occupants, and work restrictions.
 - 2. Section 01 3000 "Administrative Requirements" for general coordination requirements.

1.03 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, the condition at which roofing is insulated and weathertight; exterior walls are insulated and weathertight; and openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1.04 PROJECT COORDINATOR

- A. Project coordinator shall be the General Construction Contractor and is responsible for coordination between all other contracts.
- B. Mechanical Contract coordinator, who shall be under the direction of Project coordinator, shall be responsible for coordination between the Mechanical Contract and Electrical Contract].
 - 1. Mechanical Contractor shall act as mechanical/electrical coordinator.
Mechanical/electrical coordinator shall be licensed to practice in location of Project.

1.05 PROJECT COORDINATOR RESPONSIBILITIES

- A. Project coordinator shall perform Project coordination activities for the multiple contracts, including, but not limited to, the following:
 - 1. Provide typical overall coordination of the Work.
 - 2. Coordinate shared access to workspaces.
 - 3. Coordinate product selections for compatibility.
 - 4. Provide overall coordination of temporary facilities and controls.
 - 5. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
 - 6. Coordinate construction and operations of the Work with work performed by each Contract and Owner's construction forces, if applicable.
 - 7. Prepare coordination drawings in collaboration with each contractor to coordinate work by more than one contract.
 - 8. Coordinate sequencing and scheduling of the Work. Include the following:

- a. Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with contractors for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.
 - b. Prepare combined Contractors' Construction Schedule for entire Project. Base schedule on preliminary construction schedule. Secure time commitments for performing critical construction activities from contractors. Show activities of each contract on a separate sheet. Prepare a simplified summary sheet indicating combined construction activities of contracts.
 - 1) Submit schedules for approval.
 - 2) Distribute copies of approved schedules to contractors.
9. Provide photographic documentation.
 10. Provide quality-assurance and quality-control services specified in Section 01 4000 "Quality Requirements."
 11. Coordinate sequence of activities to accommodate tests and inspections, and coordinate schedule of tests and inspections.
 12. Provide information necessary to adjust, move, or relocate existing utility structures affected by construction.
 13. Locate existing permanent benchmarks, control points, and similar reference points, and establish permanent benchmarks on Project site.
 14. Provide field surveys of in-progress construction and site work.
 15. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one contractor has worked.
 16. Coordinate cutting and patching.
 17. Coordinate protection of the Work.
 18. Coordinate completion of interrelated punch list items.
 19. Coordinate preparation of Project Record Documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
 20. Print and submit Record Documents if installations by more than one contractor are indicated on the same Contract Drawing or Shop Drawing.
 21. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
 22. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
- B. Mechanical/Electrical Coordinator: Coordination activities of mechanical/electrical coordinator include, but are not limited to, the following:
1. Schedule and sequence mechanical and electrical activities.
 2. Coordinate sharing access to workspaces by mechanical and electrical contractors.
 3. Coordinate integration of mechanical and electrical work into limited spaces.
 4. Coordinate protection of mechanical and electrical contractors' work.
 5. Coordinate cutting and patching for mechanical and electrical work.
 6. Prepare mechanical and electrical coordination drawings.
 7. Coordinate tests and inspections for mechanical and electrical work.
 8. Coordinate mechanical and electrical temporary services and facilities.

1.06 GENERAL REQUIREMENTS OF CONTRACTS

- A. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.
1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
 2. Trenches and other excavation for the work of each contract shall be the work of **each contract for its own work** except for Site Utilities shall be by **the General Construction Contract**.
 3. Blocking, backing panels, sleeves, and metal fabrication supports for the work of each contract shall be the work of each contract for its own work.
 4. Furnishing of access panels for the work of each contract shall be the work of each contract for its own work. Installation of access panels shall be the work of **[each contract for its own work]**.
 5. Equipment pads for the work of each contract shall be the work of **[the General Construction Contract]**.
 6. Roof-mounted equipment curbs for the work of each contract shall be the work of **each contract for its own work**.
 7. Painting for the work of each contract shall be the work of the General Construction Contract.
 8. Cutting and Patching: Unless noted otherwise in the drawings or other spec section: **[Each contract shall perform its own cutting; patching shall be under the General Construction Contract]**.
- B. Substitutions: Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with remainder of the work.
1. Project coordinator shall coordinate substitutions.
- C. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Section 01 5000 "Temporary Facilities and Controls," each contractor is responsible for the following:
1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
 2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
 3. Its own storage and fabrication sheds.
 4. Temporary enclosures for its own construction activities.
 5. Staging and scaffolding for its own construction activities.
 6. General hoisting facilities for its own construction activities, up to 2 tons (2000 kg).
 7. Progress cleaning of work areas affected by its operations on a daily basis.
 8. Secure lockup of its own tools, materials, and equipment.
 9. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- D. Temporary Heating, Cooling, and Ventilation: **[General Contractor]** is responsible for temporary heating, cooling, and ventilation, including utility-use charges, temporary meters, and temporary connections.

- E. Temporary Heating, Cooling, and Ventilation: **[The General Construction Contract]** is responsible for temporary heating, cooling, and ventilation before weathertight enclosure of building is complete. **[The General Construction Contract]** is responsible for temporary heating, cooling, and ventilation after permanent enclosure of building is complete.

1.07 GENERAL CONSTRUCTION CONTRACT

- A. Work of the General Construction Contract includes, but is not limited to, the following:
1. Remaining work not identified as work under other contracts.
 2. Site preparation, including clearing, building demolition and relocations, and earthwork.
 3. Site improvements, including roadways, parking lots, pedestrian paving, site development furnishings and equipment, and landscaping.
 4. Site utilities to 5 feet from outside face of foundation wall.
 5. Trenches for site utilities.
 6. Selective demolition.
 7. Foundations, including footings, foundation walls.
 8. Slabs-on-grade, including earthwork, subdrainage systems, and insulation.
 9. Below-grade building construction, including excavation, backfill, and insulation and waterproofing/dampproofing.
 10. Superstructure, including floor and roof construction .
 11. Exterior closure, including walls, **parapets, doors, windows.**
 12. Roofing, including roof insulation, coverings, flashings **[roof specialties] [roof accessories]**.
 13. Interior construction, including partitions, doors, and fittings.
 14. Fire-protection specialties (fire extinguishers, brackets, and cabinets).
 15. Stairs, including railings and finishes.
 16. Interior finishes **[finish carpentry] [architectural woodwork, casework] [interior specialties]**, and floor and ceiling finishes.
 17. Miscellaneous items, including **[concrete equipment bases] [and] [painting of mechanical and electrical work]**.
 18. Equipment, including the following:
 - a. Foodservice equipment.
 19. Furnishings, including **window treatments.**
- B. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:
1. Temporary facilities and controls that are not otherwise specifically assigned to the **[Mechanical Contract] [Electrical Contract]**.
 2. Sediment and erosion control.
 3. Stormwater control.
 4. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
 5. Temporary enclosure for building exterior, except as indicated.
 6. Excavation support and protection, unless required solely for the Work of another contract.
 7. Special or unusual hoisting requirements for construction activities, including hoisting loads in excess of 2 tons (2000 kg), hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
 8. Project identification and temporary signs.
 9. General waste disposal facilities.

10. Temporary stairs.
11. Barricades, warning signs, and lights.
12. Site enclosure fence.
13. Security enclosure and lockup.
14. Maintenance and restoration of Owner's existing facilities used as temporary facilities.

1.08 MECHANICAL CONTRACT (PLUMBING)

- A. Work of the Mechanical Contract includes, but is not limited to, the following:
1. Plumbing fixtures.
 2. Domestic water distribution to 5 feet beyond outside face of foundation wall.
 3. Sanitary waste to 5 feet beyond outside face of foundation wall.
 4. Fire-suppression systems to 5 feet beyond outside face of foundation wall.

1.09 MECHANICAL CONTRACT (HVAC)

- A. Work of the Mechanical Contract includes, but is not limited to, the following:
1. Piping systems, Propane piping for HVAC in or on the building.
 2. HVAC systems and equipment.
 3. HVAC instrumentation and controls.
 4. HVAC testing, adjusting, and balancing.
 5. Building automation system as required.

1.10 ELECTRICAL CONTRACT

- A. Work of the Electrical Contract includes, but is not limited to, the following:
1. Site electrical distribution, lighting and communications.
 2. Electrical service, distribution and gear.
 3. Exterior and interior light fixtures and switching devices
 4. Data and communications cabling.
 5. Fire Alarm System
 6. Electrical wiring devices and connections to equipment provided by the General Construction Contract, Mechanical Contract, Food Service Supplier, and Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 1200

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**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

- A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.
- B. Section 00 7200 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- C. Section 00 7300 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- D. Section 01 2100 - Allowances: Payment procedures relating to allowances.
- E. Section 01 7800 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.
- B. Forms filled out by hand will not be accepted.
- C. Submit Schedule of Values _____ within 15 days after date of Owner-Contractor Agreement.
- D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization, bonds and insurance, and Building Permit and General Conditions .
- E. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- F. Include within each line item, a direct proportional amount of Contractor's overhead and profit.
- G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Forms filled out by hand will not be accepted.
- D. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.

8. Percentage of Completion.
 9. Balance to Finish.
 10. Retainage.
- E. Execute certification by signature of authorized officer.
 - F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
 - G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
 - H. Submit one electronic and 0 hard-copies of each Application for Payment.
 - I. Include the following with the application:
 1. Transmittal letter as specified for submittals in Section 01 3000.
 2. Current construction photographs specified in Section 01 3000.
 3. Partial release of liens from major subcontractors and vendors.
 4. Affidavits attesting to off-site stored products.
 - J. When Architect requires substantiating information, submit data justifying dollar amounts in question.

1.05 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
- B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 2. Promptly execute the change.
- C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change. Contractor shall prepare and submit a fixed price quotation within 7 days.
- D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.
- E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 3. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- F. Substantiation of Costs: Provide full information required for evaluation.
 1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.

- b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
- 2. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- G. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- J. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2000

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**SECTION 01 2100
ALLOWANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Contingency allowance.

1.02 RELATED REQUIREMENTS

- A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CONTINGENCY ALLOWANCE

- A. Funds will be drawn from the Contingency Allowance only by Change Order.
- B. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 ALLOWANCES SCHEDULE

- A. Contingency Allowance: Include the stipulated sum/price of \$40,000 for General Construction for use upon Owner's instructions.
- B. Contingency Allowance: Include the stipulated sum/price of \$[20,000 for Mechanical Construction] for use upon Owner's instructions.
- C. Contingency Allowance: Include the stipulated sum/price of \$[10,000 for Electrical Construction] for use upon Owner's instructions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2100

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SECTION 01 2500 SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 00 2113 - Instructions to Bidders: Restrictions on timing of substitution requests.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.
- C. Section 01 6000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.04 REFERENCE STANDARDS

- A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.
- B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. A Substitution Request for specified installer constitutes a representation that the submitter:

1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 1. Note explicitly any non-compliant characteristics.
- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- E. Limit each request to a single proposed substitution item.
 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Submittal Time Restrictions:
 1. Owner will consider requests for substitutions only if submitted at least 7 days prior to the date for receipt of bids.
- B. Submittal Form (before award of contract):
 1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- C. Substitutions will not be considered under one or more of the following circumstances:
 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 2. Without a separate written request.
 3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.

3.05 ACCEPTANCE

3.06 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION 01 2500

**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Progress photographs.
- G. Coordination drawings.
- H. Submittals for review, information, and project closeout.
- I. Number of copies of submittals.
- J. Requests for Information (RFI) procedures.
- K. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions: Dates for applications for payment.
- B. Section 01 6000 - Product Requirements: General product requirements.
- C. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
- D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 REFERENCE STANDARDS

- A. AIA G716 - Request for Information; 2004.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to Architect:
 - 1. Requests for Information (RFI).
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.

1.05 PROJECT COORDINATOR

- A. Project Coordinator: The General Contractor shall serve as the Project Coordinator.

- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for _____ access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for Information.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Schedule meeting after Notice of Award.
- B. Architect will schedule a meeting after Notice of Award.
- C. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Architect's consultants as determined by Architect.
- D. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 5. Submission of initial Submittal schedule.
 - 6. Designation of personnel representing the parties to Contract and Architect.
 - 7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Scheduling activities of testing agency.

- E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

- A. Schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Special consultants.
 - 5. Contractor's superintendent.
 - 6. Major subcontractors.
- C. Agenda:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements.
 - 3. Construction facilities and controls provided by Owner.
 - 4. Temporary utilities provided by Owner.
 - 5. Survey and building layout.
 - 6. Security and housekeeping procedures.
 - 7. Schedules.
 - 8. Application for payment procedures.
 - 9. Procedures for testing.
 - 10. Procedures for maintaining record documents.
 - 11. Requirements for start-up of equipment.
 - 12. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals with every other meeting allowed to be online versus on-site.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- D. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Special consultants.
 - 5. Contractor's superintendent.
 - 6. Major subcontractors.
- E. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.

5. Review of submittals schedule and status of submittals.
 6. Review of RFIs log and status of responses.
 7. Review of off-site fabrication and delivery schedules.
 8. Maintenance of progress schedule.
 9. Corrective measures to regain projected schedules.
 10. Planned progress during succeeding work period.
 11. Coordination of projected progress.
 12. Maintenance of quality and work standards.
 13. Effect of proposed changes on progress schedule and coordination.
 14. Other business relating to work.
- F. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 14 days after date established in Notice to Proceed, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule every 30 days.

3.05 PROGRESS PHOTOGRAPHS

- A. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.
- B. Photography Type: Digital; electronic files.
- C. In addition to periodic, recurring views, take photographs of each of the following events:
 1. Excavations in progress.
 2. Foundations in progress and upon completion.
 3. Structural framing in progress and upon completion.
 4. Enclosure of building, upon completion.

3.06 COORDINATION DRAWINGS

- A. Provide information required by Project Coordinator for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

3.07 REQUESTS FOR INFORMATION (RFI)

- A. Definition: A request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.

- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Prepare in a format and with content acceptable to Owner.
 - 3. Prepare using software provided by the Electronic Document Submittal Service.
 - 4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 - 3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 - 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 - 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 - 2. Owner's, Architect's, and Contractor's names.
 - 3. Discrete and consecutive RFI number, and descriptive subject/title.
 - 4. Issue date, and requested reply date.
 - 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 - 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.

7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.
 5. Remove improper or frivolous RFIs.
- H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 3:00 PM will be considered as having been received on the following regular working day.
 1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
 1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.08 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
 1. Submit at the same time as the preliminary schedule specified in Section - 01 3216 - Construction Progress Schedule.
 2. Coordinate with Contractor's construction schedule and schedule of values.
 3. Format schedule to allow tracking of status of submittals throughout duration of construction.
 4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
 5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.09 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Design data.
 - 3. Shop drawings.
 - 4. Samples for selection.
 - 5. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.10 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Certificates.
 - 2. Test reports.
 - 3. Inspection reports.
 - 4. Manufacturer's instructions.
 - 5. Manufacturer's field reports.
 - 6. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

3.11 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.12 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. Retained samples will not be returned to Contractor unless specifically so stated.

3.13 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Use a single transmittal for related items.

2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 3. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Architect.
 4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Upload submittals in electronic form to Electronic Document Submittal Service website.
 8. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
 - c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 days.
 9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 10. Provide space for Contractor and Architect review stamps.
 11. When revised for resubmission, identify all changes made since previous submission.
 12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 14. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
 2. Collect required information into a single submittal.
 3. Submit concurrently with related shop drawing submittal.
 4. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Do not reproduce Contract Documents to create shop drawings.
 3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.

2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval. Provide separate submittal page for each item image.

3.14 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
 1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Architect's and consultants' actions on items submitted for review:
 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Reviewed", or language with same legal meaning.
 - b. "Furnish as Noted", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Furnish as Noted, Resubmit for Record", or language with same legal meaning.
 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Revise and Resubmit".
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.
 - 2) Non-responsive resubmittals may be rejected.
 - b. "Rejected".
 - 1) Submit item complying with requirements of Contract Documents.
- E. Architect's and consultants' actions on items submitted for information:
 1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Contractor.

END OF SECTION 01 3000

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**SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Work sequence and occupancy.

1.03 SUBMITTALS

- A. Within 14 days after date established in Notice to Proceed, submit preliminary schedule.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
- D. Submit updated schedule every 30 days.
- E. Submit in PDF format.

1.04 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.05 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 24 x 36 inches.
- C. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 PRELIMINARY SCHEDULE**

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules to define critical portions of the entire schedule.
- E. Include conferences and meetings in schedule.
- F. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

- G. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- H. Indicate delivery dates for owner-furnished products.
- I. Coordinate content with schedule of values specified in Section 01 2000 - Price and Payment Procedures.
- J. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.04 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.05 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION 01 3216

SECTION 01 4000 QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. References and standards.
- D. Testing and inspection agencies and services.
- E. Contractor's construction-related professional design services.
- F. Contractor's design-related professional design services.
- G. Control of installation.
- H. Mock-ups.
- I. Tolerances.
- J. Manufacturers' field services.
- K. Defect Assessment.

1.02 RELATED REQUIREMENTS

- A. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 2100 - Allowances: Allowance for payment of testing services.
- C. Section 01 3000 - Administrative Requirements: Submittal procedures.
- D. Section 01 4216 - Definitions.
- E. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).
- B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2026.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2025.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2026.
- G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.
- H. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2025.

1.04 DEFINITIONS

- A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

- B. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.
 - 1. Design Services Types Required:
 - a. Construction-Related: Services Contractor needs to provide in order to carry out the Contractor's sole responsibilities for construction means, methods, techniques, sequences, and procedures.
 - b. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.
- C. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.05 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
 - 1. Temporary sheeting, shoring, or supports.
 - 2. Temporary scaffolding.
 - 3. Temporary bracing.
 - 4. Temporary foundation underpinning.
 - 5. Temporary stairs or steps required for construction access only.
 - 6. Temporary hoist(s) and rigging.
 - 7. Investigation of soil conditions to support construction equipment.

1.06 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Base design on performance and/or design criteria indicated in individual specification sections.
 - 1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.
- C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
 - 1. Concrete Mix Design: As described in Section 03 3000 - Cast-in-Place Concrete.
 - 2. Structural Design of Metal Framing: As described in Section 05 4000 - Cold-Formed Metal Framing.
 - 3. Structural Design of Metal Fabrications: As described in Section 05 5000 - Metal Fabrications.
 - 4. Structural Design of Railings: As described in Section 05 5213 - Pipe and Tube Railings.
 - 5. Structural Calculations: As described in Section 07 4213.23 - Metal Composite Material Wall Panels.
 - 6. Structural Design: Include physical characteristics, engineering calculations, and resulting dimensional limitations as described in Section 08 4313 - Aluminum-Framed Storefronts.
 - 7. Sprinkler Layout: Coordinate with ceiling installation, detailed pipe layout, and hydraulic calculations as described in Section 21 1300 - Fire-Suppression Sprinkler Systems.

1.07 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for Owner's information.
 - 1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
 - a. Full name.
 - b. Professional licensure information.
 - c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.
- C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
 - 1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
 - 2. Include required product data and shop drawings.
 - 3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
 - 4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.
- D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
 - 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

- F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- G. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
- H. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
 - 1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
 - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.08 QUALITY ASSURANCE

- A. Testing Agency Qualifications:
 - 1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.
- B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- C. Contractor's Quality Control (CQC) Plan:
 - 1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
 - a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
 - 1) Include qualifications (in resume form), duties, responsibilities of each person assigned to CQC function.
 - b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
 - 1) Management and control of documents and records relating to quality.
 - 2) Communications.
 - 3) Coordination procedures.
 - 4) Resource management.
 - 5) Process control.
 - 6) Inspection and testing procedures and scheduling.
 - 7) Control of noncomplying work.
 - 8) Tracking deficiencies from identification, through acceptable corrective action, and verification.
 - 9) Control of testing and measuring equipment.

- 10) Project materials certification.
- 11) Managerial continuity and flexibility.
- c. Acceptance of the plan is required prior to start of construction activities not including mobilization work. Owner's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. Owner reserves the right to require Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.

1.09 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.10 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Contractor shall employ and pay for services of an independent testing agency to perform specified testing.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Contractor Employed Agency:
 - 1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, and ASTM D3740.
 - 2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
 - 3. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
 - 4. Laboratory: Authorized to operate in the State in which the Project is located.
 - 5. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 - 6. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.

- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.
- D. Notify Architect fifteen (15) working days in advance of dates and times when mock-ups will be constructed.
- E. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.
- F. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- G. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- H. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
 - 1. Architect will issue written comments within seven (7) working days of initial review and each subsequent follow up review of each mock-up.
 - 2. Make corrections as necessary until Architect's approval is issued.
- I. Architect will use accepted mock-ups as a comparison standard for the remaining Work.
- J. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.
- K. Where possible salvage and recycle the demolished mock-up materials.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.

- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01 4000

SECTION 01 4100 REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following:
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- D. State of North Dakota amendments to some or all of the following.
- E. City of New Town amendments to some or all of the following.
- F. ICC (IFC) - International Fire Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. Building Code: _____.
- I. Plumbing Code: _____.
- J. ICC (IMC) - International Mechanical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. Mechanical Code: _____.
- L. ICC (IFGC) - International Fuel Gas Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. Fuel Gas Code: _____.
- N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- O. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- P. Energy Code: _____.
- Q. Existing Building Code: (IEBC).
- R. Effective January 1, 2026, the North Dakota State Building Code consists of the 2024 International Building Code (IBC), International Residential Code (IRC), International Mechanical Code (IMC), International Fuel Gas Code (IFGC), International Energy Conservation Code, and the International Existing Building Code as published by the International Code Council (ICC).

1.02 RELATED REQUIREMENTS

- A. Section 01 4000 - Quality Requirements.

1.03 QUALITY ASSURANCE

- A. Contractor's Designer Qualifications: Refer to Section - 01 4000 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 4100

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**SECTION 01 4216
DEFINITIONS****PART 1 GENERAL****1.01 SUMMARY**

- A. This section supplements the definitions contained in the General Conditions.
- B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

- A. Furnish: To supply, deliver, unload, and inspect for damage.
- B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
- E. Provide: To furnish and install.
- F. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION 01 4216**

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TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dewatering
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Waste removal facilities and services.
- F. Project identification sign.

1.02 DEWATERING

- A. Provide temporary means and methods for dewatering all temporary facilities and controls.

1.03 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power and metering, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

- A. Construction: Contractor's option.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.08 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

- B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.09 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- C. Provide containers with lids. Remove trash from site periodically.
- D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on drawings.
- B. Erect on site at location established by Architect.
- C. No other signs are allowed without Owner permission except those required by law.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Identification of Owner-supplied products.
- B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- C. Section 01 4000 - Quality Requirements: Product quality monitoring.
- D. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS**2.01 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. See Section 01 4000 - Quality Requirements, for additional source quality control requirements.
- C. Use of products having any of the following characteristics is not permitted:

1. Containing lead, cadmium, or asbestos.
- D. Where other criteria are met, Contractor shall give preference to products that:
 1. If used on interior, have lower emissions, as defined in Section 01 6116.
 2. If wet-applied, have lower VOC content, as defined in Section 01 6116.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.

3.02 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.
 1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.
- C. Store and protect products in accordance with manufacturers' instructions.
- D. Store with seals and labels intact and legible.

- E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- F. For exterior storage of fabricated products, place on sloped supports above ground.
- G. Provide off-site storage and protection when site does not permit on-site storage or protection.
 - 1. Execute a formal supplemental agreement between Owner and Contractor allowing off-site storage, for each occurrence.
- H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- I. Comply with manufacturer's warranty conditions, if any.
- J. Do not store products directly on the ground.
- K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- L. Prevent contact with material that may cause corrosion, discoloration, or staining.
- M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 6000

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**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Pre-installation meetings.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on work of Owner or separate Contractor.
 - g. Written permission of affected separate Contractor.
 - h. Date and time work will be executed.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
 - 1. Minimum of 5 years of documented experience.
- B. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,
- C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.05 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Perform dewatering activities, as required, for the duration of the project.
- E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- G. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

- A. See Section 01 1000 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.

- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect 7 days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with _____ copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- G. Utilize recognized engineering survey practices.
- H. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- J. Periodically verify layouts by same means.
- K. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-complying work.
- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- F. Restore work with new products in accordance with requirements of Contract Documents.
- G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
- I. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.

- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- H. Prohibit traffic from landscaped areas.
- I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

- A. See Section 01 7900 - Demonstration and Training.

3.11 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

3.12 FINAL CLEANING

- A. Execute final cleaning prior to Substantial Completion.
 - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
- B. Use cleaning materials that are nonhazardous.
- C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

- E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- F. Replace filters of operating equipment.
- G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- H. Clean site; sweep paved areas, rake clean landscaped surfaces.
- I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and Owner.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's comprehensive list of items to be completed or corrected.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- E. Owner will occupy all of the building as specified in Section 01 1000.
- F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- H. Accompany Project Coordinator on Contractor's preliminary final inspection.
- I. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- J. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.14 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 01 7000

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SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
 - 5. Incineration, either on- or off-site.
- E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- C. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- D. Section 01 7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.
- B. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Prebid meeting.
 - 2. Preconstruction meeting.
 - 3. Regular job-site meetings.
 - 4. Job safety meetings.
- C. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Locate enclosures out of the way of construction traffic.
 - 3. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 4. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- D. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- E. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

- F. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- G. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 01 7419

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**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions and 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect prior to final application for payment..
- B. Operation and Maintenance Data:
 - 1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 3. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.

5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 2. Field changes of dimension and detail.
 3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 1. Product data, with catalog number, size, composition, and color and texture designations.
 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 1. Description of unit or system, and component parts.
 2. Identify function, normal operating characteristics, and limiting conditions.
 3. Include performance curves, with engineering data and tests.
 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Include test and balancing reports.

- D. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents, of all volumes, and of this volume.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.
 - d. Field quality control data.
 - e. Photocopies of warranties and bonds.
- K. Digital Format: Provide all required Closeout Submittals in PDF format. Deliver both via email and include two (2) USB flash-drives along with the hardcopies.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Include in binder, signed and notarized AIA documents G704, G706, G706A, and G707.
- C. Verify that documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Retain warranties and bonds until time specified for submittal.
- F. Include originals or copies of each in operation and maintenance manuals, indexed separately on Table of Contents.

3.07 CERTIFICATE OF OCCUPANCY

- A. Include in binder, final Certificate of Occupancy provided by Authority Having Jurisdiction. Submit prior to Substantial Completion.
- B. Coordinate insurance turnover with Owner

END OF SECTION 01 7800

**SECTION 01 7900
DEMONSTRATION AND TRAINING**

PART 1 GENERAL

1.01 SUMMARY

- A. Demonstration of products and systems where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Plumbing equipment.
 - 4. Electrical systems and equipment.
 - 5. Fire Alarm / Fire Suppression systems.
 - 6. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Finishes, including flooring, wall finishes, ceiling finishes.
 - 2. Fixtures and fittings.
 - 3. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

- A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.
- B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Submit to Architect for transmittal to Owner.
 - 2. Submit not less than two weeks prior to start of training.
 - 3. Revise and resubmit until acceptable.
 - 4. Provide an overall schedule showing all training sessions.
 - 5. Include at least the following for each training session:
 - a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
 - c. Name of firm and person conducting training; include qualifications.
 - d. Intended audience, such as job description.
 - e. Objectives of training and suggested methods of ensuring adequate training.
 - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
 - g. Media to be used, such as slides, hand-outs, etc.
 - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 - 1. Include applicable portion of O&M manuals.
 - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.
- D. Training Reports:

1. Identification of each training session, date, time, and duration.
 2. Sign-in sheet showing names and job titles of attendees.
 3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
- E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
1. Format: Digital Recording.
 2. Label each file with session identification and date.

1.04 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.
- C. Demonstration may be combined with Owner personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

- A. Conduct training on-site unless otherwise indicated.
- B. Owner will provide space and seating at no cost to Contractor.
- C. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Provider.
- D. The Owner is responsible for determining that the training was satisfactorily completed and will provide approval forms.
- E. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
- F. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

1. The location of the O&M manuals and procedures for use and preservation; backup copies.
 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
 3. Typical uses of the O&M manuals.
- G. Product- and System-Specific Training:
1. Review the applicable O&M manuals.
 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
 4. Provide hands-on training on all operational modes possible and preventive maintenance.
 5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
 6. Discuss common troubleshooting problems and solutions.
 7. Discuss any peculiarities of equipment installation or operation.
 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 10. Review spare parts and tools required to be furnished by Contractor.
 11. Review spare parts suppliers and sources and procurement procedures.
- H. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION 01 7900

SECTION 02 4100 DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 1000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- E. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- F. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- G. Section 31 2200 - Grading: Rough and fine grading.
- H. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 DEFINITIONS

- A. Demolish: Dismantle, raze, destroy, or wreck any building or structure or any part thereof.
- B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
- C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.
- D. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2027.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Site Plan: Indicate:
 - 1. Areas for temporary construction and field offices.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.06 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of 3 years of documented experience.
 - 2. Demolition of structure is to occur after the contractor has a full understanding of the existing building structure, any temporary shoring needs, and a clean plan to execute the work required. A pre-construction meeting on the plan and to review the structure, is to occur prior to structural demolition.

PART 3 EXECUTION

2.01 DEMOLITION

- A. Remove paving and curbs required to accomplish new work.
- B. Remove all other paving and curbs within site boundaries.
- C. Remove other items indicated, for salvage, relocation, and recycling.
- D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with requirements in Section 01 7000.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
 - 9. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
 - 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
- C. Per the North Dakota Department of Environmental Quality, before any facility may be renovated, the affected part of the facility must be inspected for the presence of asbestos. Asbestos inspection may only be conducted by North Dakota certified asbestos inspectors. The testing shall be provided by the Owner. The Demolition Contractor or Owner shall notify the ND Dept. of Environmental Quality at least 10 days prior to work commencing and shall coordinate the required NDDEQ notifications with the Owner and Construction Manager. The building Owner and contractor(s) are directly responsible for compliance with State and Federal asbestos requirements during demolition and renovation projects. Architect shall not be responsible for any discovery, presence, handling, removal, disposal, or exposure of persons to, hazardous materials on this project site.

- D. Do not begin removal until receipt of notification to proceed from Owner.
- E. Do not begin removal until built elements to be salvaged or relocated have been removed.
- F. Protect existing structures and other elements to remain in place and not removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
 - 4. Verify existing structural conditions prior to demolition or removals.
- G. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- H. Hazardous Materials:
 - 1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.
- I. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Comply with requirements of Section 01 7419 - Construction Waste Management and Disposal.
 - 2. Dismantle existing construction and separate materials.
 - 3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

2.03 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
 - 1. Verify construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from areas that remain occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction as needed to maintain functional use of space. .

- C. Demolition and new construction is occurring adjacent to an occupied building. Dust control, maintaining exiting, and noise restrictions need to be reviewed for each scope of work. Coordinate staging plan and submit diagrams.
- D. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- E. Remove existing work as indicated and required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
 - 2. Remove items indicated on drawings.
- F. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. Verify that abandoned services serve only abandoned facilities before removal.
 - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- G. Protect existing work to remain.
 - 1. Prevent movement of structure. Provide shoring and bracing as required.
 - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch to match new work.
 - 5. Protect any existing building components which are exposed as a result of demolition or removals from damage and weather
- H. Coordinate and schedule all work in existing occupied portions of the building with the Owner.
- I. Coordinate interior and exterior access points, and security controls, with owner, during overhead demolition work. Ensure public and staff protection measures are in place during overhead work.

2.05 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 4100

SECTION 03 0516
UNDERSLAB VAPOR BARRIER - STEGO

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Sheet vapor barrier under concrete slabs on grade.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Preparation of subgrade, granular fill, placement of concrete.

1.03 REFERENCE STANDARDS

- A. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.
- B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products.
- C. Test Data: Submit report of tests showing compliance with specified requirements.
 - 1. Summary of test results per paragraph 9.3 of ASTM E1745.
 - 2. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.
- D. Samples: Submit samples of underslab vapor barrier to be used.
- E. Manufacturer's Installation Instructions:
 - 1. Indicate installation procedures and interface required with adjacent construction.
 - 2. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
 - 3. Contact vapor barrier manufacturer to schedule a pre-construction meeting and to coordinate a review, in-person or digital, of the vapor barrier installation.
- F. Vapor barrier manufacturer must warrant in writing (a) compliance with the designated ASTM E1745 classification, and (b) no manufacturing defects in the product for, at least, the Life of the Building.
- G. Manufacturer verify in writing 20 years in the industry with no reported product failures.

PART 2 PRODUCTS**2.01 MATERIALS**

- A. Underslab Vapor Barrier:
 - 1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
 - 2. Complying with ASTM E1745 Class A.
 - 3. Thickness: 15 mils.
 - 4. Product:
 - a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil): (877) 464-7834 www.stegoindustries.com/#sle.
 - b. Vaporguard by Reef Industries, 713-507-4250. www.reefindustries.com
 - c. Moistop Ultra 15 by Fortifiber, (800) 773-4777 <https://www.fortifiber.com/product/moistop-ultra-15/>

- d. WR Meadows; Perminator.
 - e. Viaflex (Formerly Raven Industries); Vapor Block.
 - f. Substitutions: Not permitted.
- B. Warranty: (a) compliance with the designated ASTM E1745 classification, and (b) no manufacturing defects in the product for, at least, the Life of the Building.
- C. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.
- D. Perimeter edge/seal
- 1. Approved tape with a textured surface that creates a mechanical seal to freshly-placed concrete.
- E. Vapor Barrier-Safe Screed System
- 1. Approved vapor barrier-safe, fixed elevation, point-to-point guide screed system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier. Ensure that subsoil is approved by Architect or Geotechnical Engineer. Level and compact base material.

3.02 INSTALLATION

- A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.
- 1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
 - 2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
 - a. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double-sided tape, or both termination bar and double-sided tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
- B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.
- C. Lap joints minimum 6 inches and seal with manufacturer's seam tape.
- D. Apply seam tape/textured tape/double-sided tape to a clean and dry vapor barrier.
- E. Seal all penetrations (including pipes) per manufacturer's instructions.
- F. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.
- G. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.
- H. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
- I. Repair damaged vapor retarder before covering with other materials.
- J. For vapor barrier-safe concrete screeding applications, install vapor barrier-safe, fixed elevation, point-to-point guide screed system prior to placing concrete.

END OF SECTION 03 0516

**SECTION 03 1000
CONCRETE FORMING AND ACCESSORIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.
- B. Form accessories.
- C. Form stripping.

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.

1.03 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary; 2025.
- B. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- C. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials and Commentary; 2010 (Reapproved 2015).
- D. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on void form materials and installation requirements.

1.05 QUALITY ASSURANCE**1.06 DELIVERY, STORAGE, AND HANDLING****PART 2 PRODUCTS****2.01 FORMWORK - GENERAL**

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.
- C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.
- D. Comply with relevant portions of ACI CODE-318, ACI PRC-347, and ACI SPEC-301.
- E. Use the following form types:
 - 1. Basement Walls Not Exposed To View: Site fabricated plywood.
 - 2. Basement Walls Exposed To View: Site fabricated rough sawn lumber.
 - 3. Elevated Floor Slabs: Prefabricated glass fiber pan forms, treated for exposed to view finish.
 - 4. Elevated Floor/Roof Slabs: Permanent prefabricated foam panel formwork; formwork to remain.

2.02 REMOVABLE PREFABRICATED FORMS

- A. Pan Type: Glass fiber, of size and profile indicated.

2.03 PERMANENT PREFABRICATED FOAM PANEL FORMWORK

- A. Floor/Roof Deck Forms: Pre-engineered expanded polystyrene foam plastic deck and beam/joist forms with factory installed metal channel furring strips flush with face of panel and field installed form stiffener slots.
 - 1. Structural Performance: In accordance with applicable code.
 - 2. Form Cross Section: As indicated on drawings; flat-bottomed solid foam blocks with voids only for stiffeners and beam/joist cross-section; interlocking long edges.

2.04 FORMWORK ACCESSORIES

- A. Form Ties: Removable type, galvanized metal, fixed length, cone type, with waterproofing washer, ____ inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface. Provide _____ manufactured by _____.
- B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
- C. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 1200.

PART 3 EXECUTION**3.01 ERECTION - FORMWORK**

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Install permanent insulated foam panel formwork per manufacturer's recommendations.

3.02 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

3.03 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

3.04 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.

3.05 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI SPEC-117, unless otherwise indicated.
- B. Construct permanent insulated foam panel formwork to maintain tolerances required by ACI SPEC-301.

3.06 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

3.07 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

END OF SECTION 03 1000

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SECTION 03 2000 CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel reinforcement bars.
 - 2. Welded-wire reinforcement.
- B. Related Requirements:
 - 1. Section 03 3000 "Cast-in-Place Concrete"

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction contraction and isolation joints.
 - c. Steel-reinforcement installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of steel reinforcement.
 - 2. Bar supports.
- B. Shop Drawings: Comply with ACI SP-066:
 - 1. Include placing drawings that detail fabrication, bending, and placement.
 - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
 - 1. Location of construction joints is subject to approval of Architect.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
 - 1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M.
- B. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Steel Reinforcement:
 - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

- B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
 - 1. Store reinforcement to avoid contact with earth.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

2.2 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, 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.
 - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.
 - 1. Finish: Plain.

2.3 FABRICATING REINFORCEMENT

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

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor retarder.
 - 2. 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.

3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 - 2. Do not tack weld crossing reinforcing bars.

- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
 - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
 - 2. Stagger splices in accordance with ACI 318.
 - 3. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.
- G. Install structural thermal break insulated connection system in accordance with manufacturer's instructions.
- H. Install welded-wire reinforcement in longest practicable lengths.
 - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
 - a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches.
 - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
 - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
 - 4. Lace overlaps with wire.

3.3 JOINTS

- A. 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.
 - 2. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. 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.

3.4 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Inspections:
 - 1. Steel-reinforcement placement.
 - 2. Steel-reinforcement welding.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL**1.1 SUMMARY**

- A. Section Includes:
 - 1. Concrete standards.
 - 2. Concrete materials.
 - 3. Admixtures.
 - 4. Floor and slab treatments.
 - 5. Curing materials.
 - 6. Accessories.
 - 7. Repair materials.
 - 8. Concrete mixture materials.
 - 9. Concrete mixture class types.
 - 10. Concrete mixing.
- B. Related Requirements:
 - 1. Section 03 1000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
 - 2. Section 03 2000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:
 - 1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. 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 inspections and acceptance testing of concrete at Project site.
 - c. Concrete Subcontractor.
 - 2. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction joints, control joints, isolation joints, and joint-filler strips.
 - c. Semirigid joint fillers.

- d. Vapor-retarder installation.
- e. Anchor rod and anchorage device installation tolerances.
- f. Cold- and hot-weather concreting procedures.
- g. Concrete finishes and finishing.
- h. Curing procedures.
- i. Forms and form-removal limitations.
- j. Shoring and reshoring procedures.
- k. Methods for achieving specified floor and slab flatness and levelness.
- l. Floor and slab flatness and levelness measurements.
- m. Concrete repair procedures.
- n. Concrete protection.
- o. Initial curing of standard-cured and field curing of field-cured test cylinders (ASTM C31/C31M.)
- p. Protection of field cured field test cylinders.
- q. Distribution of test reports.

1.4 ACTION SUBMITTALS

A. Product Data:

- 1. Portland cement.
- 2. Blended hydraulic cement.
- 3. Fly ash.
- 4. Aggregates.
- 5. Admixtures:
 - a. Include limitations of use. Admixtures that do not comply with reference ASTM International requirements must be submitted with test data for approval.
- 6. Vapor retarders.
- 7. Floor and slab treatments.
- 8. Liquid floor treatments.
- 9. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
- 10. Joint fillers.
- 11. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

- 1. Mixture identification.
- 2. Compressive strength at 28 days or other age as specified.
- 3. Compressive strength required at stages of construction.
- 4. Durability exposure classes for Exposure Categories F, S, W, and C.
- 5. Maximum w/cm ratio.
- 6. Calculated equilibrium and fresh density for lightweight concrete.

7. Slump or slump flow limit.
 8. Air content.
 9. Nominal maximum aggregate size.
 10. Intended placement method.
 11. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.
- C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For the following:
1. Installer: Include copies of applicable ACI certificates.
 2. Ready-mixed concrete manufacturer.
 3. Testing Agency: Include documentation indicating compliance with ASTM E329 or ASTM C1077 and copies of applicable ACI certificates for testing technicians or ACI Concrete Construction Special Inspector - MH, ASCC.
- B. Material Certificates: For each of the following:
1. Cementitious materials.
 2. Admixtures.
 3. Curing compounds.
 4. Floor and slab treatments.
 5. Bonding agents.
 6. Adhesives.
 7. Vapor retarders.
 8. Semirigid joint filler.
 9. Joint-filler strips.
 10. Repair materials.
- C. Material Test Reports: For the following:
1. Portland cement.
 2. Blended hydraulic cement.
 3. Fly ash.
 4. Aggregates.
 5. Admixtures.
- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances in accordance with ACI 117 and in compliance with ASTM E1155.
- E. Research Reports:
1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
- F. Preconstruction Test Reports: For each mix design.

- G. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.
 - 1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
 - 1. Manufacturer's production facilities and delivery vehicles certified in accordance with NRMCA's certification requirements.
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.
 - 1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Level 1. Testing agency laboratory supervisor tests to be an ACI-certified Concrete Laboratory Testing Technician, Level 2.
- D. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests on plastic concrete properties are to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with policies from ACI CPP 610.1 or an equivalent certification program.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
 - 1. Include the following information in each test report:
 - a. Admixture dosage rates.
 - b. Slump.
 - c. Air content.
 - d. Seven-day compressive strength.
 - e. 28-day compressive strength.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 as follows:
 - 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 2. When air temperature has fallen to, or is expected to fall below 40 deg F during the protection period, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

3. Do not use frozen materials or materials containing ice or snow.
 4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
 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 STANDARDS

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

- A. Source Limitations:
1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
 2. Obtain each type of admixture from single source from single manufacturer.
- B. Cementitious Materials:
1. Portland Cement: ASTM C150/C150M, Type I/II, gray.
 2. Blended Hydraulic Cement: ASTM C595/C595M, Type IL, portland-limestone cement.
 3. Pozzolans: ASTM C618, Class C, F, or N.
- C. Normal-Weight Aggregates:
1. Coarse Aggregate: ASTM C33/C33M, Class 3S
 2. Maximum Coarse-Aggregate Size: 1 inch nominal.
 3. Fine Aggregate: ASTM C33/C33M.

2.3 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C260/C260M.
- B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 2. Retarding Admixture: ASTM C494/C494M, Type B.
 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.
- C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.4 CURING MATERIALS

- A. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class A
 - 1. Curing Compound shall be a ready to use, water-base colorless liquid formulated with chemically reactive raw materials that meets the maximum VOC content limits of 100 g/L
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide Med-Cure as manufactured by W.R. Meadows, or approved equal.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 - 1. Color:
 - a. Ambient Temperature Below 50 deg F: Black.
 - b. Ambient Temperature between 50 and 85 deg F: Any color.
 - c. Ambient Temperature Above 85 deg F: White.
- D. Water: Potable water that does not cause staining of the surface.

2.5 VAPOR RETARDERS

- A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 15 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Stego Industries, LLC.
 - b. W.R. Meadows, Inc.

2.6 ACCESSORIES

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.8 CONCRETE MIXTURE MATERIALS

- 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, in accordance with ACI 301.
1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland or hydraulic cement in concrete as follows:
1. Fly Ash or Other Pozzolans: 25 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
 2. Use permeability-reducing admixture in concrete mixtures where indicated.

2.9 CONCRETE MIXTURE CLASS TYPES

- A. Class A: Normal-weight concrete used for footings.
1. Exposure Class: ACI 318 Class F1.
 2. Minimum Compressive Strength: 3500 psi at 28 days.
 3. Maximum w/cm Ratio: 0.50.
 4. Slump Limit: 5 inches, plus or minus 1-1/2 inches for concrete.
 5. Air Content:
 - a. Exposure Class F1: 4.5 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
- B. Class B: Normal-weight concrete used for foundation walls and piers.
1. Exposure Class: ACI 318 Class F2 .
 2. Minimum Compressive Strength: 4500 psi at 28 days.
 3. Maximum w/cm Ratio: 0.45.
 4. Slump Limit: 4 inches, plus or minus 1 inch for concrete.
 5. Air Content:

- a. Exposure Classes F2 and F3: 6.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
- C. Class C: Normal-weight concrete used for interior slabs-on-ground.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum w/cm Ratio : 0.50.
 - 3. Slump Limit: 5 inches, plus or minus 1.5 inches for concrete.
 - 4. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
 - 1. Daily access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
 - 4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 TOLERANCES

- A. Comply with ACI 117.

3.4 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
 - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install reglets to receive waterproofing and through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.5 INSTALLATION OF VAPOR RETARDER

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
 - 1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
 - 2. Face laps away from exposed direction of concrete pour.
 - 3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
 - 4. Lap joints 6 inches and seal with manufacturer's recommended tape.
 - 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 - 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
 - 7. Protect vapor retarder during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.6 INSTALLATION OF CAST-IN-PLACE CONCRETE

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.
- 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.
 - 1. If a section cannot be placed continuously, provide construction joints as indicated.
 - 2. Deposit concrete to avoid segregation.
 - 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. 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. Do not place concrete floors and slabs in a checkerboard sequence.
 - 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 3. Maintain reinforcement in position on chairs during concrete placement.
 - 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 5. Level concrete, cut high areas, and fill low areas.
 - 6. Slope surfaces uniformly to drains where required.
 - 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 - 8. Do not further disturb slab surfaces before starting finishing operations.

3.7 INSTALLATION OF JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
 - 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 - 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-third of concrete thickness as follows:
 - 1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

- D. Isolation Joints in Slabs-on-Ground: 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 on Drawings.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 07 9200 "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:
 - 1. Install dowel bars and support assemblies at joints where indicated on Drawings.
 - 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.
- F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.8 APPLICATION OF FINISHING FLOORS AND SLABS

- A. Float Finish:
 - 1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
 - 2. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
 - 3. Apply float finish to surfaces to receive trowel finish.
- B. Trowel Finish:
 - 1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
 - 2. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance.
 - 3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 4. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
 - 5. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
 - 6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 - 7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
 - a. Slabs on Ground:
 - 1) Specified overall values of flatness, FF 35; and of levelness, FL 25; with minimum local values of flatness, FF 24; and of levelness, FL 17.

- C. Trowel and Fine-Broom Finish: First apply a trowel finish to surfaces indicated on Drawings. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
 - 1. Coordinate required final finish with Architect before application.
 - 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with a fiber-bristle broom perpendicular to main traffic route.
 - 2. Coordinate required final finish with Architect before application.

3.9 APPLICATION OF FINISHING FORMED SURFACES

- A. As-Cast Surface Finishes:
 - 1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
 - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
 - b. Remove projections larger than 1 inch.
 - c. Tie holes do not require patching.
 - d. Surface Tolerance: ACI 117, Class D.
 - e. Apply to concrete surfaces for metal lap pan deck formed surfaces and those surfaces that are buried or covered with subsequent installed surfaces.
 - 2. ACI 301 Surface Finish SF-3.0:
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/8 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class A.
 - e. Locations: Apply to concrete surfaces exposed to public view,.
- B. Rubbed Finish: Apply the following to as cast surface finishes where indicated on Drawings:
 - 1. Smooth-Rubbed Finish:
 - a. Perform no later than one day after form removal.
 - b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
 - c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
 - d. Maintain required patterns or variances as shown on Drawings or to match mockups.
 - 2. Grout-Cleaned Rubbed Finish:
 - a. Clean concrete surfaces after contiguous surfaces are completed and accessible.
 - b. Do not clean concrete surfaces as Work progresses.

- c. Mix 1 part portland cement to 1-1/2 parts fine sand, complying with ASTM C144 or ASTM C404, by volume, with sufficient water to produce a mixture with the consistency of thick paint. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces.
 - d. Wet concrete surfaces.
 - e. 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.
 - f. Maintain required patterns or variances as shown on Drawings or to match mockups.
- C. Related Unformed Surfaces:
- 1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
 - 2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling in:
- 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
 - 3. 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 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 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
 - 3. Minimum Compressive Strength: 4000 psi at 28 days.
 - 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 - 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.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.11 APPLICATION OF CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 - 1. Comply with ACI 301 for cold weather protection during curing.
 - 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
 - 3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.
- B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
 - 1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 - 2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
 - 3. If forms remain during curing period, moist cure after loosening forms.
 - 4. If removing forms before end of curing period, continue curing for remainder of curing period as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
 - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.
- C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
 - 1. Begin curing after finishing concrete.
 - 2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections, as well as Floors to Receive Penetrating Liquid Floor Treatments : Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12 inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

- 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
- 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following not in cold weather:
 - a) Water.
 - b) Continuous water-fog spray.
- 4) Curing Compound:
 - a) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - b) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - c) Maintain continuity of coating, and repair damage during curing period.
 - d) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

3.12 INSTALLATION OF JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least one month(s).
- 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 deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 INSTALLATION OF CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 1. Repair and patch defective areas when approved by Architect.
 2. Remove and replace concrete that cannot be repaired and patched to meet specification requirements.
- 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 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

- a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
 - d. Fill and compact with patching mortar before bonding agent has dried.
 - e. 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.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and match surrounding surface.
 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.
- D. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
 3. After concrete has cured at least 14 days, correct high areas by grinding.
 4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
 5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.
 6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.

- b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
- 8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. 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.

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
 - 1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
 - 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 - 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.

- 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results of fresh concrete, including slump or slump flow, air content, temperature and density.
 - 13) Information on storage and curing of samples at the Project site, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.
- B. Delivery Tickets: comply with ASTM C94/C94M.
- C. Inspections:
1. Headed bolts and studs.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
 6. Batch Plant Inspections: On a random basis, as determined by Architect.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 150 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C143/C143M:
 - a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests as needed.
 3. Slump Flow: ASTM C1611/C1611M:
 - a. One test at point of delivery for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests as needed.
 4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; .
 - a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
 5. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample when strength test specimens are cast.
 6. Concrete Density: ASTM C138/C138M:

- a. One test for each composite sample when strength test specimens are cast.
 7. Unit Weight: ASTM C138/C138M density of fresh structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture. The fresh density should be consistent with that associated with the equilibrium density within a tolerance of plus or minus 4 lb/ft.3.
 8. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and standard cure two sets of five 4-inch by 8-inch cylindrical specimens for each composite sample.
 - b. Cast, and field cure one sets of four standard cylindrical specimens for each composite sample.
 9. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one standard cured specimen at seven days and one set of three specimens at 28 days. Hold one specimen.
 - b. Test one field-cured specimen at seven days and one set of three specimens at 28 days.
 - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 10. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 11. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
 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:
 - a. Testing and inspecting agency to 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.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.
 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 in accordance with ASTM E1155 within 48 hours of completion of floor finishing and promptly report test results to Architect.

3.15 PROTECTION**A. Protect concrete surfaces as follows:**

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. 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.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION

**SECTION 04 2000
UNIT MASONRY****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Concrete block.
- B. Common brick.
- C. Mortar and grout.
- D. Reinforcement and anchorage.
- E. Flashings.
- F. Lintels.
- G. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 04 0511 - Masonry Mortaring and Grouting.
- B. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- C. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2025.
- D. ASTM C90 - Standard Specification for Dry-Cast Loadbearing Concrete Masonry Units; 2024a.
- E. ASTM C91/C91M - Standard Specification for Masonry Cement; 2025.
- F. ASTM C129 - Standard Specification for Dry-Cast Nonloadbearing Concrete Masonry Units; 2025.
- G. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.
- H. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- I. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.
- J. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2026.
- K. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025b.
- L. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- M. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- N. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2024.
- O. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- P. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- Q. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

1.06 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1.07 MOCK-UPS

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, wall openings, flashings (with lap joint, corner, and end dam), and weather barrier in mock-up.
- B. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS**2.01 CONCRETE MASONRY UNITS**

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
 - 2. Nonloadbearing Units: ASTM C129.
 - a. Hollow block, as indicated.

2.02 BRICK UNITS

- A. Manufacturers:
 - 1. Belden Brick: www.beldenbrick.com/#sle.
 - 2. Endicott Clay Products Co; Face Brick - FBX: www.endicott.com/#sle.
 - 3. General Shale Brick: www.generalshale.com/#sle.
 - 4. Hebron Brick Company: <https://www.hebronbrick.com/>
 - 5. Pacific Clay Products Inc: www.pacificclay.com/#sle.
 - 6. Yankee Hill Brick Mfg. Co: www.yankeehillbrick.com/#sle.
 - 7. Substitutions: See section 01 6000 - Product Requirements.
- B. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
 - 1. Color and texture: Basis of Design: Hebron, Scoria -Velour Finish.
 - 2. Nominal size: Standard.
 - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
 - 4. Compressive strength: As indicated on drawings, measured in accordance with ASTM C67/C67M.

2.03 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 0511.

- B. Masonry Cement: ASTM C91/C91M, Type N.
 - 1. Colored Mortar: Premixed cement as required to match Architect's color sample.
- C. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
 - 1. Not more than 0.60 percent alkali.
- D. Hydrated Lime: ASTM C207, Type S.
- E. Mortar Aggregate: ASTM C144.
- F. Grout Aggregate: ASTM C404.
- G. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): As selected by Architect from manufacturer's full range.
 - 2. Manufacturers:
 - a. Davis Colors, a division of Venator Materials PLC; _____: www.daviscolors.com/#sle.
 - b. Lambert Corporation; _____: www.lambertusa.com/#sle.
 - c. Solomon Colors, Inc; _____: www.solomoncolors.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- H. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
 - 1. 3GEN Masonry Products; THERM-A-BREAK WING ANCHOR - Concrete: www.3genmp.com.
 - 2. Blok-Lok Limited: www.blok-lok.com/#sle.
 - 3. FEROCORPORATION; FEROCOR FAST Soffit Concealer: www.ferocorp.com/#sle.
 - 4. Heckmann Building Products, Inc; Pos-I-Tie Thermal Clip: www.heckmannbuildingprods.com/#sle
 - 5. Hohmann & Barnard, Inc; X-Seal Anchor: www.h-b.com/#sle.
 - 6. MKT Fastening; Post-Installed Mechanical Anchors: www.mktfasteningusa.com/#sle.
 - 7. TruFast Walls, a division of Altenloh, Brinck & Co. US, Inc; Thermal-Grip MVA: www.trufastwalls.com/#sle.
 - 8. WIRE-BOND: www.wirebond.com/#sle.
- B. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - 2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 - 3. Vertical adjustment: Not less than 3-1/2 inches.
 - 4. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.

2.05 FLASHINGS

- A. Metal Flashing Materials: Stainless Steel, as specified in Section 07 6200.
- B. Metal Flashing Materials:
 - 1. Stainless Steel Flashing: ASTM A666/A666M, Type 304, soft temper; 26 gauge, 0.0187 inch thick; finish 2B to 2D.

- C. Termination Bars: Stainless steel; compatible with membrane and adhesives.
 - 1. Manufacturers:
 - a. 3GEN Masonry Products: www.3genmp.com/#sle.
 - b. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - c. Mortar Net Solutions; Termination Bars: www.mortarnet.com/#sle.
 - d. WIRE-BOND: www.wirebond.com/#sle.
 - e. York Flashings; Termination Bar: www.yorkflashings.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- D. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.
 - 1. Manufacturers:
 - a. 3GEN Masonry Products: www.3genmp.com/#sle.
 - b. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - c. Mortar Net Solutions; Metal Drip Edges: www.mortarnet.com/#sle.
 - d. WIRE-BOND: www.wirebond.com/#sle.
 - e. York Flashings: www.yorkflashings.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

- A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Full-Height Airspace Maintenance and Drainage Material: Mesh panels fitted between masonry ties.
 - a. Drainage Material Thickness: 3/8 inch.
 - b. Manufacturers:
 - 1) Advanced Building Products, Inc; Mortairvent-CW: www.advancedbuildingproducts.com/#sle.
 - 2) CavClear, a Division of Archovations Inc; CavClear Masonry Mat: www.cavclear.com/#sle.
 - 3) Substitutions: See Section 01 6000 - Product Requirements.
- B. Weeps:
 - 1. Type: Polyester mesh.
 - 2. Color(s): As indicated on drawings.
 - 3. Color(s): As selected by Architect from manufacturer's full range.
 - 4. Manufacturers:
 - a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
 - b. Blok-Lok Limited: www.blok-lok.com/#sle.
 - c. CavClear, a Division of Archovations Inc: www.cavclear.com/#sle.
 - d. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - e. Masonry Technology, Inc: www.mtidry.com/#sle.
 - f. Mortar Net Solutions; WeepVent: www.mortarnet.com/#sle.
 - g. WIRE-BOND: www.wirebond.com/#sle.
 - h. York Flashings: www.yorkflashings.com/#sle.
 - i. Substitutions: See Section 01 6000 - Product Requirements.
- C. Cavity Vents:
 - 1. Type: Preformed aluminum vents with sloping louvers.
 - 2. Color(s): As selected by Architect from manufacturer's full range.

3. Manufacturers:

- a. Advanced Building Products, Inc; _____ :
www.advancedbuildingproducts.com/#sle.
- b. Blok-Lok Limited; _____ : www.blok-lok.com/#sle.
- c. Hohmann & Barnard, Inc; _____ : www.h-b.com/#sle.
- d. Mortar Net Solutions; CellVent: www.mortarnet.com/#sle.
- e. WIRE-BOND; _____ : www.wirebond.com/#sle.

D. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 LINTELS

A. Prefabricated Steel Lintels:

B. Brickwork Support System: Offset steel relief angles or lintels with hanger brackets for support of brickwork above horizontal masonry joints and openings to allow insulation to span continuously behind brick and eliminate continuous thermal bridges associated with support systems that interrupt continuous insulation.

1. Configuration: Relief angle or lintel with welded hanger brackets anchored to structure.
2. Sizes: Component and anchor sizes and spacing to be determined by manufacturer from calculations or prescriptive design tables to suit project loading conditions and cavity width indicated on drawings.
3. Materials: Steel, hot dip galvanized to ASTM A153/A153M class B.
4. Manufacturers:
 - a. Hohmann & Barnard, Inc; TBS - Thermal Brick System: www.h-b.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.08 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.

1. Exterior, non-loadbearing masonry: Type N.
2. Interior, loadbearing masonry: Type N.
3. Interior, non-loadbearing masonry: Type O.

B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

C. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION**3.01 INSTALLERS**

A. Installer List:

1. Substitution Limitations: Same as specified for products; see Section 01 6000 - Product Requirements.

3.02 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.03 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.04 COLD AND HOT WEATHER REQUIREMENTS

- A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.05 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
- D. Brick Units:
 - 1. Bond: Running.
 - 2. Coursing: Three units and three mortar joints to equal 8 inches.
 - 3. Mortar Joints: Concave.

3.06 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- F. Interlock intersections and external corners, except for units laid in stack bond.
- G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.07 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

- B. Install cavity vents in veneer and cavity walls at 32 inches on center horizontally below shelf angles and lintels and near top of walls.

3.08 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
- C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 1.77 sq ft of wall surface per anchor. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- C. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.10 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at nonmasonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Terminate flashing up 8 inches minimum on vertical surface of backing:
 - 1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
 - 2. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer's directions.
 - 3. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
 - 4. Anchor vertical leg of flashing into backing with a termination bar and sealant.
 - 5. Apply cap bead of sealant on top edge of self-adhered flashing.
- C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
- D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
- E. Extend metal flashings to within 1/2 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.
- F. Support flexible flashings across gaps and openings.

3.11 LINTELS

- A. Install loose steel lintels over openings.
- B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
 - 1. Openings to 42 inches: Place two, No. 3 reinforcing bars 1 inch from bottom web.

2. Openings from 42 inches to 78 inches: Place two, No. 5 reinforcing bars 1 inch from bottom web.
 3. Openings over 78 inches: Reinforce openings as detailed.
- C. Maintain minimum ____ inch bearing on each side of opening.
 - D. Install thermal brick support system in accordance with manufacturer's instructions at locations indicated on drawings

3.12 GROUTED COMPONENTS

- A. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- B. Place and consolidate grout fill without displacing reinforcing.
- C. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.13 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.
- E. Form expansion joint as detailed on drawings.

3.14 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

3.15 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.
- B. Maximum Variation from Alignment of Columns: 1/4 inch.
- C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- G. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
- H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.16 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

3.17 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.

3.18 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

3.19 SCHEDULES

- A. Exterior Wall: Composite masonry with an exterior wythe of "Dark Brown" brick veneer, bonded with wire ladder reinforcement to inner wythe of interior facing split faced concrete block masonry (CMU) with 2 inch (50 mm) space for insulation.

END OF SECTION 04 2000

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SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Structural-steel materials.
 - 2. Shrinkage-resistant grout.

1.2 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Structural-steel materials.
 - 2. High-strength, bolt-nut-washer assemblies.
 - 3. Shear stud connectors.
 - 4. Anchor rods.
 - 5. Threaded rods.
 - 6. Shrinkage-resistant grout.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment Drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
 - 5. Indicate locations and dimensions of protected zones.
 - 6. Identify demand-critical welds.
 - 7. Identify members not to be shop primed.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer fabricator.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural-steel materials, including chemical and physical properties.
- E. Product Test Reports: For the following:
 - 1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
- F. Source quality-control reports.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).
 - 1. Substitutions: See Section 01 6000 – Product Requirements; including the following requirements:
 - a. Fabricator must have a documented quality control manual and procedure, documented certified welders and third party inspection reports of fabricated steel.
 - b. Fabricator must submit a list of project references indicating a minimum five years documented experience on projects of similar size for approval by Architect.
 - c. Fabricator must obtain written approval of project Architect prior to submitting bid.
- B. Installer Qualifications: A qualified erector specializing in performing Work of this section, with a minimum five years documented experience. Work shall be performed by qualified steelworkers and in accordance with Section 7, AISC Code of Standard Practice.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds are to pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G are to be considered separate processes for welding personnel qualification.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.

3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
 1. ANSI/AISC 303.
 2. ANSI/AISC 341.
 3. ANSI/AISC 360.
 4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:
 1. Option 1: Connection designs have been completed and connections indicated on the Drawings.

2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M.
- B. Channels, Angles, M-Shapes: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M and ASTM A572/A572M, Grade 50.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.
- E. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts or Grade F2280 tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 1. Direct-Tension Indicators: ASTM F959/F959M, Type 490-1, compressible-washer type with plain finish.
- C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex round head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 1. Finish: Plain

2.4 RODS

- A. Unheaded Anchor Rods: ASTM F1554, Grade 36.
 1. Configuration: Straight.
 2. Nuts: ASTM A563 heavy-hex carbon steel.
 3. Plate Washers: ASTM A36/A36M carbon steel.

4. Washers: ASTM F436, Type 1, hardened carbon steel.
5. Finish: Plain.

B. Headed Anchor Rods: ASTM F1554, Grade 55 , straight.

1. Nuts: ASTM A563 heavy-hex carbon steel.
2. Plate Washers: ASTM A36/A36M carbon steel.
3. Washers: ASTM F436, Type 1, hardened carbon steel.
4. Finish: Plain.

2.5 PRIMER

A. Steel Primer:

1. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.6 SHRINKAGE-RESISTANT GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.7 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 3.

- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.8 SHOP CONNECTIONS

- A. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.9 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces unless indicated to be painted.
6. Corrosion-resisting (weathering) steel surfaces.
7. Surfaces enclosed in interior construction.

- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 2.
2. SSPC-SP 3.

- C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.10 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165/E165M.
 - b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E164.
 - d. Radiographic Inspection: ASTM E94/E94M.

4. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.
 1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of baseplate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.

- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
 - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs [where indicated], back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 REPAIR

- A. Touchup Painting:
 - 1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

3.6 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
 - 1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
 - a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
 - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3) Ultrasonic Inspection: ASTM E164.
 - 4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION

SECTION 05 2100
STEEL JOIST FRAMING

PART 1 - GENERAL**1.1 SUMMARY**

- A. Section Includes:
 - 1. K-series steel joists.
 - 2. Steel joist accessories.

1.2 DEFINITIONS

- A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.
- B. Shop Drawings:
 - 1. Include layout, designation, number, type, location, and spacing of joists.
 - 2. Include joining and anchorage details; bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Welding certificates.
- C. Manufacturer certificates.
- D. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.
- E. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
 - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. New Millennium Building Systems, LLC.
2. Vulcraft; Nucor Corporation, Vercor Group.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated on Drawings.
1. Use ASD; data are given at service-load level.
 2. Design special joists to withstand design loads with live-load deflections no greater than the following:
 - a. Roof Joists: Vertical deflection of $1/360$ of the span.

2.3 STEEL JOISTS

- A. K-Series Steel Joist: Manufactured steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
1. Joist Type: K-series steel joists.
 2. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated on Drawings, complying with SJI's "Specifications."
 3. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated on Drawings, complying with SJI's "Specifications."
 4. Camber joists according to SJI's "Specifications."
 5. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds $1/4$ inch per 12 inches.

2.4 PRIMERS

- A. Primer:
1. SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.5 STEEL JOIST ACCESSORIES

- A. Bridging:
1. Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- B. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
1. Finish: Plain.
- C. Welding Electrodes: Comply with AWS standards.
- D. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.6 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written instructions, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
- C. Field weld joists to supporting steel framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using carbon-steel bolts.
- E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 REPAIRS

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Touchup Painting:
 - 1. Immediately after installation, clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists abutting structural steel, and accessories.
 - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 - b. Apply a compatible primer of same type as primer used on adjacent surfaces.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
 - 1. Visually inspect field welds according to AWS D1.1/D1.1M.
 - 2. Visually inspect bolted connections.
 - 3. Prepare test and inspection reports.

END OF SECTION

SECTION 05 3100 STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof deck.
 - 2. Noncomposite form deck.
- B. Related Requirements:
 - 1. Section 03 3000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.

1.2 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, section properties, load tables, diaphragm shear tables, dimensions, finishes, and noise reduction coefficients (for acoustic only).
 - 1. Roof deck.
 - 2. Noncomposite form deck.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding codes:
 - 1. AWS D1.1/D1.1M.
 - 2. AWS D1.3/D1.3M.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.
- B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.
- C. Deck provided shall meet the minimum design gage and yield strength specified on the drawings, or meet minimum specified section properties at specified yield strength.
- D. Deck shall be multi-span whenever possible and as indicated on the drawings.
 1. Floor and form decks shall not require shoring during the concrete placement procedure.

2.2 MANUFACTURERS

- A. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. New Millennium Building Systems, LLC.
 2. Vulcraft; Nucor Corporation, Verco Group.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 6000 "Product Requirements."

2.3 MATERIALS AND FINISH

- A. Sheet steel for uncoated or phosphatized top/painted bottom deck shall conform to ASTM A 1008 / A 1008M with a minimum yield strength of 50 ksi unless otherwise noted, or other structural sheet steels or high strength low alloy steels in accordance with AISI S100, Section A2.
 1. Primer-painted finish on both the top and bottom sides, in the Manufacturer's standard color.
- B. Sheet steel for galvanized deck shall conform to ASTM A 653/A 653M Structural Steel, with a minimum yield strength of 50 ksi unless otherwise noted, or other galvanized structural sheet steels or high strength low alloy steels in accordance with AISI S100, Section A2.
 1. Galvanized coating shall comply with ASTM A 653/A 653M with G60 zinc coating.

2.4 ROOF DECK

- A. Fabrication of Roof Deck: Fabricate panels to comply with SDI RD, with the minimum section properties indicated. Deck type and thickness shall be as indicated on the drawings
 1. Type 1.5B Deck: Wide ribbed panel.
 - a. Profile Depth: 1-1/2 inches deep
 - b. Profile Pitch: 6 inches
 - c. Coverage width: 36 inches
 - d. Side-lap Formation: Nestable.
 - e. Finish: Prime painted.

2.5 NONCOMPOSITE FORM DECK

- A. Fabrication of Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite deck panels used as a form to comply with SDI NC, with the minimum section properties indicated, and with the following:
 1. Profile Depth: 1-1/2 inches.
 2. Design Uncoated-Steel Thickness: 0.0358 inch.
 3. Side Laps: Overlapped or interlocking seam at Contractor's option.

2.6 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Sheet steel for accessories shall conform to ASTM A 653/A 653M, Structural Steel for structural accessories, ASTM A 653/A 653M Commercial Steel for non-structural accessories, or ASTM A 1008 / A 1008M for either structural or non-structural accessories. Other structural sheet steels or high strength low alloy steels shall be permitted in accordance with AISI S100, Section A2.
- F. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- I. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch- wide flanges and sloped recessed pans of 1-1/2-inch minimum depth. For drains, cut holes in the field.
- J. Galvanizing Repair Paint: ASTM A780/A780M.
- K. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install in accordance with deck manufacturer's written instructions.

3.3 INSTALLATION OF ROOF DECK

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 36 inches, and as follows:
 - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2 inches minimum or butted at Contractor's option.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches apart with at least one fastener at each corner.
 - 1. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Mechanically fasten cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive in accordance with manufacturer's written instructions to ensure complete closure.
- G. Sound-Absorbing Insulation: Installation into topside ribs of deck as specified.

3.4 INSTALLATION OF FLOOR DECK

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
 - 1. 1. Weld Diameter: 5/8 inch, nominal, unless noted otherwise.
 - 2. 2. Weld Spacing:
 - a. a. Space and locate welds as indicated.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 36 inches, and as follows:
 - 1. 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 - 2. 2. Mechanically clinch or button punch at 12 inches on center.

- 3. 3. Unless noted otherwise on the drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 inches for deck profiles 2 inches or less and 2-1/2 inches for 3 inch deck profiles, with end joints as follows:
 - 1. 1. End Joints: Butted.
- D. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck in accordance with SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.5 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
 - 1. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.
 - a. Field welds and other deck fasteners will be subject to inspection.
 - 2. Steel decking will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION

**SECTION 05 4000
COLD-FORMED METAL FRAMING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Formed steel stud exterior wall framing.

1.02 RELATED REQUIREMENTS**1.03 REFERENCE STANDARDS**

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2024.
- B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2020.
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2025.
- E. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
- F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.
- C. Design Data:

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a professional structural engineer experienced in designing this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS**2.01 MANUFACTURERS****2.02 PERFORMANCE REQUIREMENTS**

- A. Design Requirements: Design cold-formed framing systems, components and connectors to withstand specified design loads in compliance with ICC (IBC), ASCE 7, AISI S100, and AISI S240.
- B. Design Criteria: In accordance with applicable codes.
 - 1. Live load deflection meeting the following, unless otherwise indicated:
 - 2. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
 - 3. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.03 MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

2.04 STRUCTURAL FRAMING COMPONENTS

- A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.

2.05 CONNECTIONS**PART 3 EXECUTION****3.01 PREPARATION****3.02 INSTALLATION - GENERAL**

- A. Install structural members and connections in compliance with ASTM C1007.

3.03 INSTALLATION OF STUDS**3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.

3.05 TOLERANCES

END OF SECTION 05 4000

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Shop fabricated steel items.
- B. Bollards: Steel pipe, concrete filled

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- C. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.
- D. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- E. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- F. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).
- H. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).
- I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
 - a. Include the following, as applicable:
 - 1) Design criteria.
 - 2) Member sizes and gauges.
 - 3) Details of connections.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- D. Designer's Qualification Statement.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.04 QUALITY ASSURANCE

- A. Design handrails and guards under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS**2.01 MATERIALS - STEEL**

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATED ITEMS

- A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
- B. Lintels: As detailed; prime paint finish.

2.03 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5000

**SECTION 05 5133
METAL LADDERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prefabricated ladders.

1.02 REFERENCE STANDARDS

- A. ANSI A14.3 - American National Standard for Ladders - Fixed - Safety Requirements; 2008 (Reaffirmed 2018).

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
- C. Specimen warranty.
- D. Executed warranty.

1.04 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for material and workmanship. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 PREFABRICATED LADDERS

- A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
 - 1. Components: Manufacturer's standard rails, rungs, treads, handrails, returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
 - 2. Materials: Aluminum; 6063 alloy, T52 temper.
 - 3. Finish: Powder coat; color to be selected by Architect from manufacturer's standard range.
 - 4. Manufacturers:
 - a. Alaco Ladder Company; 560 Series Fixed Wall Ladder: www.alacoladder.com/#sle.
 - b. O'Keeffe's Inc; Model 501: www.okeeffes.com/#sle.
 - c. Precision Ladders, LLC; Fixed Aluminum Wall Ladder: www.precisionladders.com/#sle.

END OF SECTION 05 5133

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**SECTION 05 5213
PIPE AND TUBE RAILINGS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Wall mounted handrails.
- B. Stair railings and guardrails.
- C. Free-standing railings at steps.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of anchors in masonry.
- C. Section 05 5100 - Metal Stairs: Handrails other than those specified in this section.
- D. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.
- E. Section 09 9113 - Exterior Painting: Paint finish.
- F. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. AISC 207 - Standard for Certification Programs; 2025.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- G. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- I. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).
- J. AWS C3.4M/C3.4 - Specification for Torch Brazing; 2026.
- K. AWS C3.5M/C3.5 - Specification for Induction Brazing; 2026.
- L. AWS C3.9M/C3.9 - Specification for Resistance Brazing; 2020.
- M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).
- N. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
- O. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).
- P. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated within the previous 12 months.
- D. Designer's Qualification Statement.
- E. Fabricator's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months.
- C. Fabricator Qualifications:
 - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 207.
 - 2. A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
 - 3. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Handrails and Railings:

2.02 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.

2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
 3. For anchorage to stud walls, provide backing plates, for bolting anchors.
 4. Posts: Provide adjustable flanged brackets.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- H. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
1. Ease exposed edges to a small uniform radius.
 2. Welded Joints:
 - a. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
 - b. Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.
 3. Brass/Bronze Brazed Joints:
 - a. Perform torch brazing in accordance with AWS C3.4M/C3.4.
 - b. Perform induction brazing in accordance with AWS C3.5M/C 3.5.
 - c. Perform resistance brazing in accordance with AWS C3.9M/C3.9.

2.03 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, black finish.
- C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- F. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Weld connections that cannot be shop welded due to size limitations.

1. Weld in accordance with AWS D1.1/D1.1M.
2. Match shop welding and bolting.
3. Clean welds, bolted connections, and abraded areas.
4. Touch up shop primer and factory-applied finishes.
5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5213

SECTION 06 1053
MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Preservative treatment (PPT).
- B. Fire-retardant treatment (FRT).
- C. Communications and electrical room mounting boards.
- D. Lumber and plywood in contact with membrane roofing and flashing.
- E. Lumber and plywood in contact with membrane waterproofing and flashing.
- F. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS**1.03 REFERENCE STANDARDS**

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2022.
- C. AWPA M4 - Standard for the Handling, Storage, Field Fabrication and Field Treatment of Preservative-Treated Wood Products; 2023.
- D. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.
- E. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. ITS (DIR) - Directory of Listed Products; Current Edition.
- G. PS 1 - Structural Plywood; 2023.
- H. PS 20 - American Softwood Lumber Standard; 2025.
- I. UL (DIR) - Online Certifications Directory; Current Edition.
- J. WWPA G-5 - Western Lumber Grading Rules; 2025.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Fire-retardant treatment.
 - 2. Pressure-preservative treatment.
 - 3. Field-applied preservative treatment product data and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Cover wood products to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- B. Fire-Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org), and that provides grading service for species and grade specified. Provide lumber stamped with grade mark unless otherwise indicated.
2. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER

- A. Grading Agency: Western Wood Products Association; WWPA G-5.
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Stud Framing for sizes 2 by 2 through 2 by 6:
 1. Species: Any species allowed under referenced grading rules.
 2. Grade: No.2.
- E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 1. Lumber: S4S, No.2 or Standard Grade.
 2. Boards: Standard or No.3.
- F. Sill Plates: 1-1/2 inch thick laminated strand lumber.
 1. Comply with AWPA U1 use category 2.
 2. R-Value: 1.86 when tested in accordance with ASTM E518/E518M.
 3. Products:
 - a. Prebuck, LLC; Sill Plate: www.tremcosealants.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- G. Window and Door Bucks: 1-1/2 inch thick laminated strand lumber.
 1. Comply with AWPA U1 use category 2.
 2. R-Value: 1.86 when tested in accordance with ASTM E518/E518M.
 3. Products:
 - a. Prebuck, LLC; Window and Door Buck: www.tremcosealants.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- H. Parapet Caps: 1-1/2 inch thick, laminated strand lumber.
 1. Comply with AWPA U1 use category 2.
 2. R-Value: 1.86 when tested in accordance with ASTM E518/E518M.
 3. Products:
 - a. Prebuck, LLC; Parapet Cap: www.tremcosealants.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: PS 1, A-D plywood; 3/4 inch thick; fire-retardant treated.

2.04 FIRE-RETARDANT TREATMENT (FRT)

- A. Manufacturers:
 1. Great Southern Wood Preserving, Inc; FlameFreez (FRTW): www.flamefreez.com/#sle.
 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Provide factory-treated wood members in accordance with AWPA U1 and use category indicated.

- C. Fire-Retardant Treatment: Interior Type A, Use Category UCFA (LT), Low-Temperature (low hygroscopic).
 - 1. Treat electrical and communications panel backer boards.
- D. Kiln-dry after treatment (KDAT) to maximum moisture content of 19 percent for sawn material and 15 percent for plywood.
- E. Fabrication of FRT Wood:
 - 1. Ripping or milling of boards, lumber, and timber after treatment is not permitted.
 - 2. Field cutting to length and drilling of holes in boards, lumber, and timber are permitted without additional treatment.
 - 3. Field cutting and drilling of holes in plywood are permitted.
- F. Label or brand FRT wood with classification mark of UL (DIR) or ITS (DIR) or other approved inspection agency, the treatment plant, name of treatment, species of wood, flame spread and smoke-developed indexes, method of drying after treatment, and treating standard.

2.05 PRESSURE-PRESERVATIVE TREATMENT (PPT)

- A. Provide factory-treated wood members in accordance with AWPA U1 and use category indicated.
- B. Kiln-dry wood after treatment with waterborne preservative to maximum moisture content of 19 percent for lumber and 15 percent for plywood.
- C. Perform fabrication such as cutting, boring, milling, and surfacing to maximum extent practicable before treatment.
- D. Label preservative-treated wood with marking as required by AWPA U1 and ICC (IBC). Unless otherwise permitted by standard U1 and the building code, include the following markings: AWPA U1, accredited inspection agency's mark, treating plant identification, type of preservative, retention, and end use.
- E. Field Treatment for Cuts and Holes in Preservative-Treated Wood: Comply with AWPA M4.

2.06 ACCESSORIES

- A. Metal and Finish of Fasteners:
 - 1. Fire-Retardant-Treated Wood:
 - a. Nails, timber rivets, wood screws, and lag screws: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
 - 2. Preservative-Treated Wood:
 - a. Nails, timber rivets, wood screws, and lag screws - general use: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
 - 3. Untreated Wood: Unfinished steel.
- B. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.

PART 3 EXECUTION

3.01 PREPARATION

- A. Where wood framing bears on cementitious foundations, install full-width sill flashing over top of foundation, lap ends of flashing minimum of 4 inches, and seal.
- B. Install sill gasket under sill plate bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- C. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to greatest extent possible; clearly separate scrap for use on-site as accessory components, including shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items unless item can be securely fastened to two or more studs or another method of support is explicitly indicated.
- D. Where ceiling mounting is indicated, provide blocking and supplementary supports above ceiling unless another method of support is explicitly indicated.
- E. Provide the following specific nonstructural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Chalkboards and marker boards.
 - 8. Wall paneling and trim.
 - 9. Joints of rigid wall coverings that occur between studs.
 - 10. Toilet, Bath, and Laundry accessories.
 - 11. Toilet Compartments.
 - 12. TV Brackets.
 - 13. Dimensional Letter Signage

3.04 WATERPROOFING-RELATED CARPENTRY

- A. Coordinate installation of carpentry with deck construction, framing of openings, and waterproofing assembly installation.
- B. Provide wood curb at openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: Secure with screws to studs; space fasteners at maximum 24 inches on center.
 - 1. At fire-rated walls, install board over wallboard indicated as part of fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 - 3. Install adjacent boards without gaps.

3.06 SITE-APPLIED WOOD TREATMENT

- A. Apply preservative treatment to field-cut surfaces in accordance with manufacturer's instructions wherever cuts, holes, sawing, or other fabrication of wood members is required after pressure-preservative treatment.
- B. Apply preservative treatment in accordance with manufacturer's instructions.
- C. Allow preservative to dry prior to erecting members.

3.07 CLEANING

- A. Waste Disposal: See Section 01 7419 - Construction Waste Management and Disposal.
 - 1. Comply with applicable regulations.
 - 2. Do not burn scrap on project site.
 - 3. Do not burn scraps that have been pressure treated.
 - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering storm drainage system.

END OF SECTION 06 1053

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**SECTION 06 1600
SHEATHING - USG**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Sheathing.

1.02 RELATED REQUIREMENTS

- A. Section 07 2700 - Air Barriers.

1.03 REFERENCE STANDARDS

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2024.
- B. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- F. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- G. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2025.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on sheathing and application instructions.
- C. Certificate: Certify that products of this section meet or exceed specified requirements.
- D. Specimen warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store products above ground in dry ventilated space to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- C. Store panels over stable soil capable of carrying load of pallets.
- D. Protect materials from soiling and damage.
- E. Deliver materials to site promptly without undue exposure to weather.

- F. Deliver in manufacturer's unopened containers, pallets, or panels fully identified with name, brand, type, and grade.
- G. Do not stack panels over plus or minus 1/2 inch off pallet edge.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide warranty for material defects and fabrication as noted in manufacturer's documentation. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. USG Corporation: www.usg.com/#sle.
- B. Georgia-Pacific Gypsum LLC.
- C. Certainteed; SAINT-GOBAIN.
- D. Substitutions: See Section 01 6000 - Product Requirements.
- E. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.02 SHEATHING

- A. Insulated Wall Sheathing: Polyisocyanurate (ISO) thermal board insulation with Classification indicated, in compliance with ASTM C1289
 - 1. Overall Panel Thickness: 2-5/8". See drawings for thicknesses and locations.
 - 2. Plywood Thickness: 5/8" (nominal). All plywood is not required to be Fire-Retardant treated.
 - 3. Classifications
 - a. Type V: Faced with oriented strand board (OSB) or plywood on one major surface of core foam and glass fiber mat facer on other major surface of core foam.
 - 1) Compressive Strength: 16 psi minimum
 - 2) Thermal Resistance, R-Value: Not less than 6.6, ASTM C518 at 75 degrees F
 - 4. Products
 - a. Atlas; Energy Shield Ply Pro: <https://wall.atlaswri.com>
 - b. Hunter Panels; Xci Ply: www.hunterpanels.com/#sle.
 - c. Substitutions: See Section 01 6000 – Product Requirements.
- B. Glass-mat-faced gypsum wall sheathing, comply with ASTM C1177/C1177M.
 - 1. Thickness: 5/8 inch.
 - 2. Edges: Square.
 - 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 4. Products:
 - a. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Firecode X.
 - b. GP; DensGlass.
 - c. Certainteed; SAINT-GOBAIN.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Glass-mat-faced gypsum wall sheathing with integral water-resistive and air barrier, comply with ASTM C1177/C1177M.
 - 1. Size: 48 by 96 inches, nominal.
 - 2. Thickness: 5/8 inch.

3. Edges: Square.
4. Water Vapor Permeance: 1 perm, minimum, when tested in accordance with ASTM E96/E96M.
5. Air Permeance, Sheathing: 0.001 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
6. Air Permeance, Assembly: 0.04 cfm/sq ft, maximum, when tested in accordance with ASTM E2357.
7. Products:
 - a. USG Corporation; Securock ExoAir 430 Panel.

2.03 ACCESSORIES

- A. Fasteners and Anchors:
 1. General: Refer to manufacturer product information for fastener types and requirements.
 2. Corrosion-resistant steel for 800 hours minimum in accordance with ASTM B117, unless noted otherwise on drawings.
 3. High Humidity and Preservative-Treated Wood Locations: Hot dip galvanized.
 4. Anchors: Toggle bolt type for anchorage to hollow masonry.
- B. Panel Treatment: Use manufacturer-recommended sealant, transition trips, flashing sheets, termination bars, patching materials, and adhesive tapes at control joints, panel connections, and penetrations.
- C. Sealants:
 1. Medium-modulus, low-VOC, polyurethane for use in joints, penetrations, and transition areas.
 - a. USG Corporation; Dymonic 100.
- D. Transition Membrane: Silicone extrusion for expansion joints between panels.
 1. USG Corporation; Proglaze ETA Connections.
- E. Air Barrier: See Section 07 2700.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify wall, roof, and floor framing meet deflection criteria noted in drawings, as recommended by manufacturer and local building code requirements.
- B. Examine substrates and adjoining construction.
- C. Replace damaged framing before installation. Proceed with installation only after unsatisfactory conditions corrected.

3.02 PREPARATION

- A. Coordinate installation of roof and floor deck construction, framing of openings, and other assembly installation.
- B. Coordinate installation of rough carpentry members specified in other sections.

3.03 INSTALLATION

- A. Select material sizes to minimize waste.
- B. Reuse and clearly separate scrap for use on-site as accessory components, including shims, bracing, and blocking.
- C. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws.

1. Install control joints at every building construction joint and as recommended by cladding system manufacturer. Refer to sheathing manufacturer for more information.
- D. Wall Sheathing with Integrated Water-Resistive Barrier and Air Barrier: Secure to studs in accordance with manufacturer's installation instructions.
 1. Install with water-resistive and air barrier on exterior side of sheathing.
 2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
 3. Do not install directly over masonry surfaces; use furring strips or framing.
 4. Apply manufacturer's standard seam sealants and transition membranes.

3.04 TOLERANCES

- A. Variation from Plane; Surfaces Other Than Floors: 1/4 inch in 10 feet, maximum, and 1/4 inch in 30 feet, maximum.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.

3.06 CLEANING

- A. Waste Disposal: See Section 01 7419 - Construction Waste Management and Disposal.
 1. Comply with applicable regulations.
 2. Do not burn scrap on project site.
 3. Do not burn pressure treated scraps.
- B. Clean material debris, shavings, and sawdust prior to Substantial Completion of project.

3.07 PROTECTION

- A. Cover sheathing panels by exterior cladding or other weather-resistive barrier. Do not expose panels to elements for more than 12 months after installation. If exposure anticipated past 12 months, apply joint treatments, weather-resistive barrier, or air barrier according to manufacturer's recommendations.

END OF SECTION 06 1600

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Specialty fabricated cabinet units, including:
 - 1. Base cabinets.
 - 2. Custom display cases.
- B. Hardware.

1.02 RELATED REQUIREMENTS

- A. Section 05 7300 - Decorative Metal Railings: Foot rail.
- B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 06 2000 - Finish Carpentry: Specialty fabricated panelling, trim, etc.
- D. Section 07 9200 - Joint Sealers: Sealant at millwork and countertops at walls.
- E. Section 08 8000 - Glazing.
- F. Section 12 3600 - Countertops.
- G. Division 26 - Electrical: Coordination of lighting and electrical trim and connections.

1.03 ABBREVIATIONS AND ACRONYMS

- A. AWI: Architectural Woodwork Institute.
- B. CLS: Cabinet Liner Standard.
- C. HGS: Horizontal Grade Standard.
- D. HPL: High-Pressure Laminate.
- E. HPL-B: High-Pressure Laminate Backer.
- F. HPDL: High-Pressure Decorative Laminate.
- G. HPDL-B: High-Pressure Decorative Laminate Backer.
- H. MDF: Medium-density fiberboard.
- I. TFL: Thermally-Fused Laminate.
- J. VGS: Vertical Grade Standard.

1.04 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2022.
- B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.
- C. ANSI/AWI 0641 - Architectural Wood Casework; 2019.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- F. AWI 300 - Materials; 2018.
- G. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- H. BHMA A156.9 - Cabinet Hardware; 2020.

- I. ISO 4586-3 - High-Pressure Decorative Laminates (HPL, HPDL) – Sheets Based on Thermosetting Resins (Usually Called Laminates) – Part 3: Classification and Specifications for Laminates Less than 2 mm Thick and Intended for Bonding to Supporting Substrates; 2018.
- J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data For each type of product demonstrating hardware design, quality and finish of including but not limited to the items listed below. : Submit manufacturer's published, product descriptive data.
 - 1. Laminate Edgebanding: For each type, indicate thickness.
 - 2. Hardware: For each type of cabinet and drawer hardware.
 - 3. Locks: For each type of cabinet and drawer lock.
 - 4. Accessory Components: For each type of grommet and shelf standard.
- C. Shop Drawings: Include dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
 - 1. Show locations of furring size, blocking, and hanging strips, including concealed blocking and reinforcement specified in other sections.
 - 2. Include section drawings of typical and special casework, work surfaces and accessories.
 - 3. Indicate locations of plumbing and electrical service field connection by others.
 - 4. Provide one set of shop drawings which includes all products within this section, engineered and built by a single source manufacturer, with seamless coordination amongst all products.
 - 5. Show locations of sizes of cutouts and holes for items installed in plastic laminate architectural cabinets.
- D. Samples:
 - 1. High-Pressure Decorative Laminate (HDPL): Two each, 3 inch by 5 inch, of each type of color, pattern and finish indicated on Drawings.
 - 2. Edgebanding: Two each, of colors and thickness as indicated on Drawings.
 - 3. Cabinet Pull : One physical sample of each type of hardware as indicated on Drawings.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- F. Informational Submittal:
 - 1. Test Reports: Valid AWI "Performance Quality Test Report" indicating compliance with specified ANSI/AWI 0641.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating products specified in this section with minimum five years of documented experience.
 - 1. Company with at least one project in the past 5 years with similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.
 - 2. Not required, but preferred accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
 - 3. Single Source Responsibility: Provide fabrication and installation from single woodworking company.
- B. Quality Certification:

1. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.
2. Unless otherwise indicated, comply with AWI (QCP) Woodwork Quality Certification Service/Program for grades of interior architectural woodwork, construction, finishes and other requirements: www.awiqcp.org/#sle.
3. Comply with WI (CCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section:
<https://woodworkinstitute.com/#sle>.
4. Submit certifications upon completion of installation that verifies that work is in compliance with specified requirements.
5. Replace, repair, or rework all work for which certification is refused.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
- B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.08 FIELD CONDITIONS

- A. Environmental Limitations Without Humidity Control: Do not deliver or install cabinets until the building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
 1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation.
- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction and indicate measurements on Shop Drawings.
- C. Establish Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 PRODUCTS

2.01 ARCHITECTURAL WOOD CASEWORK

- A. Quality Standard : Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- B. Quality Standard (Display Cases) : Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- C. Casework Finish: Wood casework with laminate cladding.
- D. Provide casework and casework components in sizes and profiles as indicated on Drawings.
- E. Adjustable Shelves, Number of Shelves Per Cabinet Unit: As indicated on Drawings.

F. Scribed Fillers:

1. Finish and Materials: Same materials and finish as exposed surfaces.

2.02 PERFORMANCE REQUIREMENTS

A. Typical Casework:

1. Structural Performance: Duty Level 3, in accordance with ANSI/AWI 0641.

B. Display Cases:

1. Aesthetic Performance: Premium Grade in accordance with ANSI/AWI 0641.
2. Structural Performance: Duty Level 4, in accordance with ANSI/AWI 0641.

2.03 WOOD CASEWORK WITH LAMINATE CLADDING

A. Casework Construction:

1. Frameless Cabinet and Door Interface: Flush overlay.
2. Door and Drawer Front Profile: Flush.
3. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets. Mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.
 - a. Tops, bottoms and sides of all cabinets are particleboard core.
4. Cabinet Backs: 1/4 inch thick medium density fiberboard (MDF) panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4 inch by 4 inch particleboard rails will be placed behind the back panel at the top and bottom, and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt glue to further secure back and increase overall strength.
 - a. Exposed back on fixed or movable cabinets: 3/4 inch thick particleboard with the exterior surface finished in VGS decorative laminate as selected.
5. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick plywood. Base is 102mm (nominal 4 inch) high unless otherwise indicated on the Drawings.
6. Base Units: Full sub-top glued and doweled to cabinet sides. Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.
 - a. Exception: Sink base units.
7. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
8. Cabinet Body Face Frame:
 - a. Exposed and Semi-Exposed Edges: 1mm PVC, machine applied.
9. Adjustable Shelves in Cabinets:
 - a. Core: Particleboard.
 - b. Core Thickness: 3/4 inch up to 30 inches wide, 1 inch over 30 inches wide.
10. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.

B. Wood Drawer Boxes Construction:

1. Cladding: TFL.
2. Sides, back and sub front: Minimum 1/2 inch thick particleboard, doweled and glued into sides.

3. Drawer bottom: Minimum 1/2 inch thick particleboard laminated, screwed directly to the bottom edges of drawer box.
- C. Door/Drawer Fronts Construction:
 1. Core: 3/4 inch thick particleboard.
 2. High-pressure VGS decorative laminate exterior, balanced with high-pressure CLS. Use of TFL on exterior or interior surfaces of door/drawer fronts will not be permitted.
 3. Provide double doors in opening in excess of 24 inches wide.
- D. Custom Display Cases:
 1. Base Support Assemblies:
 - a. Material shall be a minimum of 17.5 mm (0.688 inch) thick with a minimum finished installed height of 101.6 mm (4 inches).
 2. Interior of display cases to be HPL over MDF substrate.
 3. Casework Construction: Frameless.
 - a. Horizontal reveal between countertop's bottom edge and false fronts shall be 3.2mm (0.125 inch) to 9.5mm (0.375 inch) and shall be consistent across elevations.
 4. Ends and Divisions:
 - a. On wall-hung cabinets, if cabinet ends or sides extend below the cabinet bottoms, the portion below the cabinet bottom is considered an exposed interior surface and shall be the same color and pattern as the exposed surface.
 - b. Exposed ends shall be of integral construction or secondarily applied.
 - c. When viewed from the side, exposed ends shall conceal all other structural cabinet components, except toe kicks.
 - d. Horizontal components (excluding countertops) shall not extend beyond the exposed end.
 - e. Secondarily applied exposed ends shall be mechanically fastened to the cabinet body.
 5. Backs: Cabinet backs are required.
 - a. At multiple-panel backs, visible joints shall be inconspicuous at exposed or semi-exposed interiors where panels intersect.
 6. Sliding Doors: Laminated Glass.
 - a. Sliding doors more than 1.5 times as tall as they are wide shall be mounted with an overhead metal track and roller hanger to prevent tipping and binding.
 - b. Frameless glass sliding doors require formed or extruded tracks.
 - c. Thickness of frameless glass sliding doors shall be a minimum of 6.4 mm (0.250 inches) laminated glass.
 - d. Stops shall be synthetic or solid stock of compatible species to adjacent surfaces and compatible color to exposed interior surfaces.
 - e. Stops shall be continuous, removable, and on the interior only.
 - f. Silicone or glazing putty used as a stop is not permitted.
 - g. Exposed rabbet shall be painted or stained compatible to the exposed interior surface.
 - h. Glass doors shall have exposed edges flat polished.
 7. Glass Door Hardware:
 - a. Double roller track system, with upper channel and lower track. Designed for use with 1/4 inch laminated glass. Recommended overlap of glass panels 1-1/2 inch.
 - 1) Bottom track with built-in smooth operating nylon rollers.
 - 2) Products:
 - (a) C.R. Lawrence; Double Roller Track System (Basis of Design):
www.crlaurence.com/.

- b. Sliding glass door plunger lock, installed directly onto glass with plunger resting against edge of back sliding door. 1-1/4 inch hole drilled in the front sliding door to accept lock.
 - 1) Products:
 - (a) C.R. Lawrence; Sliding Glass Door Plunger Lock (Basis of Design): www.crlaurence.com/.
- c. Slip-On handles for frameless glass sliding door, secured with silicone no glass fabrication is required.
 - 1) Products:
 - (a) C.R. Lawrence; Slip-On Handle for Frameless Sliding Door (Basis of Design): www.crlaurence.com/.

2.04 SOLID WOOD COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.
- B. Softwood Lumber: NIST PS 20; Graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Grade II/Custom; average moisture content of 5-10 percent; species as follows:
 - 1. Concealed Framing and Blocking: Species - fabricator's choice.

2.05 PLASTIC LAMINATE PANELS

- A. High-Pressure Decorative Laminate (PLAM): NEMA LD 3, types as recommended for specific applications.
 - 1. Panels subject to size limitations, minimum thickness requirements, and fabrication tolerances of specified aesthetic grade and performance duty level in accordance with AWI 300 and ANSI/AWI 0641.
 - 2. Manufacturer and Product: As indicated on Drawings.
 - 3. Style: As indicated on Drawings.
 - 4. Color: As indicated on Drawings.
- B. HPDL Laminates Less than 0.08 inch Thick: Comply with ISO 4586-3.
 - 1. Horizontal Grades:
 - a. HPDL HGS.
 - 2. Vertical Grades:
 - a. HPDL VGS; for exposed casework components, door and drawer fronts, and exposed cabinet end panel applications.
 - 3. Products:
 - a. Arborite: www.arborite.com/#sle.
 - b. Formica Corporation: www.formica.com/#sle.
 - c. Panolam Industries International, Inc: www.panolam.com/#sle.
 - d. Wilsonart LLC: www.wilsonart.com/#sle.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- C. Panel Cores:
 - 1. Particleboard (PTB).

2.06 CONCEALED LAMINATE PANELS

- A. Thermally Fused Laminate (TFL): Melamine-resin-saturated decorative papers; for fusion to composite wood substrates under heat and pressure. Material on interior semi-exposed casework components, unless noted otherwise.
 - 1. Test in accordance with NEMA LD 3 Section 3.
 - 2. No raw core material allowed, even if hidden from view.

- B. Cabinet Liner (CLS): Material on concealed side of door and drawer panels, 0.024 inch nominal thickness.
 - 1. Test in accordance with NEMA LD 3 Section 3.
 - 2. No raw core material allowed, even if hidden from view.
- C. High-Pressure Laminate Backer (HPL-B): Material on concealed side of horizontal surfaces, 0.048 inch nominal thickness.
 - 1. Test in accordance with NEMA LD 3 Section 3.
 - 2. No raw core material allowed, even if hidden from view.
- D. Panel Cores:
 - 1. Particleboard (PTB).
- E. Semi-Exposed Surfaces, Color: White.

2.07 PANEL CORES

- A. Particleboard (PTB):
 - 1. Description: Composite panel composed of cellulosic particles, additives, and bonding system; comply with ANSI A208.1.
 - 2. Grade:
 - a. M-2.
 - 3. Density Average: 45-50 lbs. per cubic foot.
 - 4. Thickness: Varies, see casework construction.
 - 5. Moisture-Resistant Category: MR10.
 - a. Interior applications where exposure to high humidity or intermittent contact with water (i.e. sink base cabinets and countertops with sinks). Comply with ANSI A208.1.

2.08 CABINET AND DRAWER HARDWARE

- A. Cabinet Hardware: Comply with BHMA A156.9 for hardware types and grades indicated below.
- B. Hinges, Self-Closing, Integrated Damper Hinges:
 - 1. Description: European style concealed self-closing hinges with integrated damper mechanisms.
 - 2. Features: Provide soft-closing integrated damper hinges.
 - 3. Opening Range: 120 degrees.
 - a. 90 degrees of opening at all cabinets installed adjacent to a wall.
 - 4. Cabinet door swing restrictor must be incorporated into the hinge mechanism.
 - a. No additional component, such as chins or external limiters, may be attached to the door.
 - b. Swing restrictor must provide a smooth, controlled motion to prevent door over-extension.
 - 5. Material and Finish: Satin stainless steel.
- C. Cabinet Door and Drawer Pulls (CP): Provide one at each door and drawer.
 - 1. Description: Back-mounted pulls.
 - 2. Length: As indicated on Drawings.
 - 3. Material and Finish: As indicated on Drawings.
 - 4. Products:
 - a. Dave Mockett & Company, Inc: www.mockett.com/#sle.
 - b. Titus Cabinet Hardware: www.titusplus.com/us/en/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

D. Drawer Slides:

1. Description: Hardware units that suspend drawers and provide controlled drawer sliding.
2. Features: Soft-closing.
3. Mounting: Side-mounted.
4. Extension: Full extension.
5. Static Capacity: Duty level 3. Minimum load capacity requirements, as measured per BHMA A156.9
 - a. Drawer Bottom: 1112.06 Newtons (250 lbf.).
 - b. Drawer Front: 1334.47 Newtons (300 lbf.).
 - c. General Purpose Drawers - 100 lbs.; drawers more than 3 inches high, but not more than 6 inches high and not more than 24 inches wide.
 - d. File Drawers - 150 lbs.; drawers more than 6 inches high or more than 24 inches wide.
 - e. Lateral File Drawers - 150 lbs.; drawers wider than 24 inches and less than 30 inches.
 - f. Lateral File Drawers - 200 lbs.; drawers wider than 30 inches.
 - g. At drawer bank cabinets, when the total opening height for drawers exceeds 30 inches, an intermediate front stretcher is required.

E. Cabinet Door and Drawer Silencers:

1. Description: Self-adhesive rubber silencers.
2. Doors, Quantity: One silencer at top and bottom of closing edge of each door.
3. Drawers, Quantity: One silencer at back side of each drawer front cover.
4. Size: 1/4 inch diameter; 1/8 inch projection.

F. Cabinet Door Keyed Locks with Latch Bolts:

1. Description: Keyed locks for securing cabinet doors.
2. Keying Action: Key retracts latch bolt.
3. Material and Finish: Steel with chrome finish.
4. Cabinets within same room to be keyed alike. Two keys per lock.

2.09 CASEWORK ACCESSORY COMPONENTS**A. Edgebanding (EB): Extruded PVC, flat, smooth finish; width to match component thickness.**

1. PVC: Well-matched to exposed face; radiused and beveled on edges and corners if thickness is greater than 0.039 inch .
2. Color: As indicated on Drawings.
3. Use 1mm thickness on cabinet box edge, machine applied.
4. Use 1mm thickness on all four sides of adjustable shelf edges.
5. Use 3mm thickness on all four edges of doors/drawers. Machine applied, external edges and outside corners machine profiled to 1/8 inch radius.
6. Use 1mm thickness on top edge of drawer construction.
7. Products:
 - a. Charter Industries; www.charterindustries.com/.
 - b. Formica; www.formica.com/.
 - c. Doelken; www.na.doelken.com/.
 - d. Rehau; www.rehau.com/.
 - e. Substitutions: See Section 01 6000 - Product Requirements.

B. Glass and Glazing Applications:

1. Glass: Clear, tempered, safety glass.
 - a. ASTM C1036, Type I transparent flat; Class I clear.
 - b. ASTM C1048, Kind FT fully tempered; Condition A uncoated; Quality Q3.

- c. Thickness: 1/4 inch nominal, minimum.

2.10 FABRICATION

- A. Shop-fabricate casework to dimensions, profiles, and details indicated on Drawings.
- B. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through standard building openings.
- C. When necessary to cut and fit on site, provide materials with sufficient allowance for cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with PVC edgebanding.
- E. Provide cutouts for plumbing fixtures, appliances, and outlet boxes. Verify locations of cutouts from on-site dimensions. Seal cut edges.
- F. Hardware: Install hardware in accordance with hardware manufacturer's written instructions; use fasteners supplied by hardware manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify casework and materials required for installation have been delivered, handled and stored as specified.
- B. Verify wood blocking that provides casework backing is installed as indicated on Drawings.
- C. Verify location and sizes of rough-in plumbing and rough-in electrical associated with work of this section.
- D. Verify location and sizes of cutouts for appliances and special equipment to be mounted in or adjacent to casework.
- E. The installer must examine the job site and the conditions under which the work under this section is to be performed, and notify the Architect in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been connected in a manner acceptable to the installer.

3.02 INSTALLATION

- A. Install work in accordance with ANSI/AWI 0620 requirements for grade indicated.
- B. Set and secure cabinets in place, assuring that they are rigid, plumb, and level. Shim as required.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/8 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages.
- F. Install cabinet hardware in accordance with hardware manufacturer's documented instructions using hardware manufacturer's furnished fasteners.
- G. See Section 08 8000 for site-glazing of glass applications installed in casework components.

3.03 ADJUSTING

- A. Adjust hardware for smooth operation in accordance with hardware manufacturer's documented instructions.
- B. Adjust moving or operating parts to function smoothly and correctly.

- C. Test installed work for rigidity and ability to support loads.
- D. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets in their entirety. Adjust joinery for uniform appearance.
- E. Lubricate and adjust hardware.

3.04 CLEANING

- A. Clean cabinets inside and out including but not limited to: wiping off fingerprints, pencil marks, and surface soil (i.e. sawdust and glue), in preparation for final cleaning.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.
- C. Clean cabinets on exposed and semi-exposed surfaces.

END OF SECTION 06 4100

SECTION 06 4200 WOOD PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop finishing.
- B. Wood tambour panels.

1.02 RELATED REQUIREMENTS

- A. Section 06 2000 - Finish Carpentry: Field finishing.
- B. Section 09 9300 - Staining and Transparent Finishing: Field finishing.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on fire-retardant treatment materials and application instructions.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide plan of panel number sequencing.
 - 2. Provide information as required by AWI/AWMAC/WI (AWS).
- D. Samples: Submit two samples of finished wood panels, 6 x 6 inch in size, illustrating wood grain and specified finish.

1.05 MOCK-UP

- A. See Section 01 4000-Quality Requirements for general requirements for mock-up.
- B. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect and Owner.
 - 3. Refinish mock-up area as required to produce acceptable work.
 - 4. Mock-ups are to be provided upon request at no cost to the owner.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect work from moisture damage.
- B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.
- C. Do not deliver wood materials to project site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI/AWMAC/WI (AWS).

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for fire-retardant requirements.

2.02 PANELING

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless otherwise indicated.
- B. Tambour Paneling: Thin flexible slats connected by a backing material or flexible substrate.
 - 1. Species: As indicated on Drawings.
 - 2. Panel Style: As indicated on Drawings.
 - 3. Size: As indicated on Drawings.
 - 4. Finish: As indicated on Drawings.
 - 5. Visible Edges and Reveals: As indicated on Drawings.
 - 6. Outside Corners: As indicated on drawings.

2.03 ADHESIVES AND FASTENERS

- A. Adhesives: Type suitable for intended purpose, complying with applicable air quality regulations and manufacturer's recommendation.
- B. Fasteners: Per manufacturer's recommendation.

2.04 SHOP TREATMENT OF WOOD MATERIALS

- A. Provide UL approved identification on fire-retardant treated material.
- B. Deliver fire-retardant treated materials cut to required sizes. Minimize field cutting.

2.05 FABRICATION

- A. Shop prepare and identify panels for grain matching during site erection.
- B. Prepare panels for delivery to site, permitting passage through building openings.
- C. Finish exposed edges of panels as indicated on Drawings.
- D. When necessary to cut and fit on site, provide materials with ample allowance for cutting and scribing.

2.06 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:
 - 1. See Section 09 9300 - Staining and Transparent Finishing.
- E. Prime paint surfaces that will be in contact with.
- F. Back prime woodwork items to be field finished, prior to installation.

2.07 ACCESSORIES

- A. Wood Filler: Tinted to match surface finish color.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that field measurements are as indicated on Shop Drawings.
- B. Verify adequacy of backing and support framing.
- C. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
- B. Do not begin installation until wood materials have been fully acclimated to interior conditions per the manufacturer's written recommendations.
- C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.
- D. Where necessary to cut and fit on site, scribe work abutting other components. Do not use additional overlay trim to conceal gaps.
- E. Coordinate the installation of firestopping as required behind paneling.
- F. Set exposed fasteners, fill with wood filler, and finish to match panel finish.
- G. Touch up damaged finish to match original, using materials provided by fabricator; replace components that cannot be refinished like new.

3.03 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 4200

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SECTION 06 8316
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Fiberglass reinforced plastic panels.
- B. Trim and Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between panels and adjacent construction and fixtures.
- B. Section 09 2116 - Gypsum Board Assemblies: Backer board.

1.03 REFERENCE STANDARDS

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.
- B. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- C. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- E. FDA Food Code - Chapter 6 - Physical Facilities; Current Edition.
- F. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Samples: Submit two standard FRP samples 3 by 3 inch in size illustrating material and surface design of panels.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store panels flat, indoors, on a clean, dry surface. Allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Fiberglass Reinforced Plastic Panels:
 - 1. Marlite, Inc(Basis of Design): www.marlite.com/#sle.
 - 2. Nudo Products, Inc; FiberLite FRP: www.nudo.com/#sle.
 - 3. Panolam Industries International, Inc: www.panolam.com/#sle.
 - 4. Stabilit America Inc; Glasteel: www.stabilitamerica.com/#sl
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL SYSTEMS

- A. Wall Panels; Standard (FRP):
 - 1. Panel Size: 4 by 9 feet.

2. Surface Design: As indicated on Drawings.
3. Color: As indicated on Drawings.
4. Attachment Method: Adhesive only, with trim and sealant in joints.

2.03 MATERIALS

- A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
 1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
 2. Class 1 fire rated when tested in accordance with FM 4880.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 4. Impact Strength: Greater than 6 ft/lb force per inch, when tested in accordance with ASTM D256.
 5. Surface Characteristics and Cleanability: Provide products that are smooth, durable, and easily cleanable, in compliance with FDA Food Code, Chapter 6 - Physical Facilities.
- B. Trim and Accessories: Vinyl; color coordinating with panel.
 1. Typically includes: Inside corner, Outside corner, Edges, or Division bars.
- C. Adhesive: Type recommended by panel manufacturer.
- D. Sealant: Silicone; color matching panel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation
- B. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.
- C. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.
 1. Mark plumb lines on substrate at trim accessory locations for accurate installation.
 2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instructions.

3.03 INSTALLATION - WALLS

- A. Install panels in accordance with manufacturer's written instructions.
- B. Install panels prior to wall base; allow for a maximum of 1/4 inch overlap between panel and wall base.
- C. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.
- D. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
- E. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.
- F. Install panels with manufacturer's recommended gap for panel field and corner joints.
- G. Place trim on panel before fastening edges, as required.

- H. Fill channels in trim with sealant before attaching to panel.
- I. Install trim with adhesive and screws or nails, as required.
- J. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.
- K. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION 06 8316

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**SECTION 07 1113
BITUMINOUS DAMPPROOFING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Bituminous dampproofing.
- B. Protection boards.

1.02 RELATED REQUIREMENTS

- A. Section 07 2100 - Thermal Insulation: Rigid insulation board used as protection board.

1.03 REFERENCE STANDARDS

- A. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011 (Reapproved 2023).
- B. ASTM D449/D449M - Standard Specification for Asphalt Used in Dampproofing and Waterproofing; 2003 (Reapproved 2021).
- C. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2024).
- D. ASTM D1227/D1227M - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013 (Reapproved 2024).
- E. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

1.06 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Karnak Corporation: www.karnakcorp.com/#sle.
- B. Mar-flex Waterproofing & Building Products: www.mar-flex.com/#sle.
- C. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
- D. Substitutions: See Section 01 6000 - Product Requirements.
- E. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.02 BITUMINOUS DAMPPROOFING

- A. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
 - 1. Asphalt-Base Emulsion for Metal Protective Coating: ASTM D1187/D1187M, Type I - Continuous water exposure within few days after drying or Type II - Continuous weather exposure after drying.
 - 2. Emulsified Asphalt for Roofing Protective Coating: ASTM D1227/D1227M, Type II, Class 1 - Mineral colloid emulsifying agents with non-asbestos fibers.
 - 3. VOC Content: Not more than permitted by local, State, and federal regulations.
 - 4. Applied Thickness: 1/16 inch, minimum, wet film.
 - 5. Products:
 - a. Karnak Corporation; 220 Fibered Emulsion Dampproofing: www.karnakcorp.com/#sle.
 - b. W. R. Meadows, Inc; Sealmastic Emulsion Type II (brush/spray-grade): www.wrmeadows.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.03 BITUMEN MATERIALS

- A. Cold Asphaltic Type:
 - 1. Emulsified Asphalt: ASTM D1227/D1227M, with fiber reinforcement other than asbestos, Type II, Class 1 or 2.
 - 2. Asphalt Primer: ASTM D41/D41M, compatible with substrate.

2.04 ACCESSORIES

- A. Protection Board: Rigid insulation; see Section 07 2100.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing.
- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.03 APPLICATION

- A. Foundation Walls: Apply two coats of asphalt dampproofing.
- B. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

- C. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- D. Prime surfaces at a rate approved by manufacturer for application indicated, and allow primer to dry thoroughly.
- E. Apply bitumen with roller.
- F. Apply bitumen at a temperature limited by equiviscous temperature (EVT) plus or minus 25 degrees F; do not exceed finish blowing temperature for four hours.
- G. Apply bitumen in one coat, continuous and uniform, at a rate of 25 sq ft/gal per coat.
- H. Apply from 2 inches below finish grade elevation down to top of footings.
- I. Seal items watertight with mastic, that project through dampproofing surface.
- J. Immediately backfill against dampproofing to protect from damage.
- K. Place protection board directly over dampproofing, butt joints, and adhere to tacky dampproofing.
- L. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION 07 1113

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**SECTION 07 1300
SHEET WATERPROOFING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Self-adhered modified bituminous sheet membrane.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete substrate.
- B. Section 07 2100 - Thermal Insulation: Insulation used for protective cover.

1.03 REFERENCE STANDARDS

- A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.
- D. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers; 2022.
- E. ASTM D5295/D5295M - Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems; 2018.
- F. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 2025.
- G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- H. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for membrane.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- H. Specimen Warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Construct mock-up consisting of 100 sq ft of horizontal and vertical sheet waterproofing panel; to represent finished work including internal and external corners, seam jointing, and attachment method.
- C. Locate where directed.
- D. Mock-up may remain as part of work.

1.07 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Contractor to correct defective Work within period of five years after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS**2.01 SHEET WATERPROOFING APPLICATIONS**

- A. Self-Adhered Modified Bituminous Sheet Membrane:
 - 1. Location: Concrete foundation walls typical below grade. Elevator pits. .
 - 2. Cover with drainage panel.

2.02 SHEET WATERPROOFING MATERIALS

- A. Self-Adhered Modified Bituminous Sheet Membrane:
 - 1. Thickness: 60 mil, 0.060 inch, minimum.
 - 2. Sheet Width: 36 inches, minimum.
 - 3. Tensile Strength:
 - a. Membrane: 325 psi, minimum, measured in accordance with ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches per minute.
 - 4. Elongation at Break: 300 percent, minimum, measured in accordance with ASTM D412.
 - 5. Water Vapor Permeance: 0.05 perm, maximum, measured in accordance with ASTM E96/E96M.
 - 6. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F, 180 degree bend on 1 inch mandrel.
 - 7. Adhesion: 150 psi, minimum, measured in accordance with ASTM D4541.
 - 8. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
 - 9. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 200 feet head of water applied in accordance with test method ASTM D5385/D5385M.
 - 10. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
 - 11. Products:
 - a. Henry, a Carlisle Company; Blueskin WP 200: www.henry.com/#sle.
 - b. W. R. Meadows, Inc; MEL-ROL: www.wrmeadows.com/#sle.

- c. Polyguard Products, Inc..
- d. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

- A. Seaming Materials: As recommended by membrane manufacturer.
- B. Membrane Sealant: As recommended by membrane manufacturer.
- C. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
- D. Protection Board: Rigid insulation; see Section 07 2100.
- E. Cant Strips: Premolded composition material.
- F. Flexible Flashings: Type recommended by membrane manufacturer.
- G. Termination Bars: Stainless steel; compatible with membrane and adhesives.
- H. Adhesives: As recommended by membrane manufacturer.
- I. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting work.
- B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. Verify that items penetrating surfaces to receive waterproofing are securely installed.
- D. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
- E. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
- B. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- C. Fill nonmoving joints and cracks with a filler compatible with waterproofing materials.
- D. Seal moving cracks with sealant and nonrigid filler, using procedures recommended by sealant and waterproofing manufacturers.
- E. Prepare building expansion joints at locations as indicated on drawings.
- F. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
- G. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate in accordance with ASTM D5295/D5295M.
 - 1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
 - 2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in reference standard.
 - 3. Remove and replace areas of defective concrete; see Section 03 3000.

4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in referenced standard.
5. Test concrete surfaces as described in referenced standards, and verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.03 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- B. Roll out membrane, and minimize wrinkles and bubbles.
- C. Self-Adhering Membrane: Remove release paper layer, and roll out onto substrate with a mechanical roller to provide full contact bond.
- D. Overlap edges and ends, minimum 3 inches, seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.
- E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- F. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.
- G. Install building expansion joints at locations as indicated on drawings.
- H. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
- I. Extend membrane over cants and up intersecting surfaces at membrane perimeter minimum 6 inches above horizontal surface for first ply and 6 inches at subsequent plies laid in shingle fashion.
- J. Seal membrane and flashings to adjoining surfaces.
 1. Install termination bar along edges.

3.04 PROTECTION

- A. Do not permit traffic over unprotected or uncovered membrane. Inspect waterproofing for damage
- B. Inspect waterproofing for damage prior to backfilling.
- C. Repair waterproofing as per manufacturer's recommendations.

END OF SECTION 07 1300

SECTION 07 2100 THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board insulation and integral vapor retarder at perimeter foundation wall and exterior wall behind Masonry wall finish.
- B. Batt insulation and vapor retarder in exterior wall construction, and batt insulation alone in interior walls.
- C. Batt insulation for filling crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

- A. Section 07 2700 - Air Barriers: Separate air barrier materials.

1.03 REFERENCE STANDARDS

- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- F. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2025.
- G. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Shop Drawings: Submit drawings that indicate location of joint or termination detail conditions.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.05 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

- A. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.
- B. Insulation Over Metal Stud Framed Walls, Continuous: Polyisocyanurate board.

C. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.

2.02 FOAM BOARD INSULATION MATERIALS

- A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
 2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 4. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
 5. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
 6. Board Edges: Square.
 7. Type and Water Absorption: Type XII, 0.3 percent by volume, maximum, by total immersion.
 8. Products:
 - a. DuPont de Nemours, Inc; Styrofoam Brand ____: building.dupont.com/#sle.
 - b. Kingspan Insulation LLC; GreenGuard GG25-LG XPS Insulation Board: www.kingspan.com/#sle.
 - c. Owens Corning Corporation; FOAMULAR Type ____ Extruded Polystyrene (XPS) Insulation: www.owenscorning.com/en-us/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.
1. Classifications:
 - a. Type I: Faced with aluminum foil on both major surfaces of the core foam.
 - 1) Class 1 - Non-reinforced core foam.
 - 2) Compressive Strength: 16 psi, minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0, minimum, at 75 degrees F.
 2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 4. Water Vapor Permeance: 1.2 perm, maximum, at 1 inch thickness, and when tested in accordance with ASTM E96/E96M, desiccant method.
 5. Comply with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
 6. Board Size: 48 inch by 96 inch.
 7. Board Thickness: 2.0 inch.
 8. Board Edges: Square.
 9. Products:
 - a. Atlas Roofing Corporation; EnergyShield XR Continuous Insulation: www.atlasroofing.com/#sle.
 - b. Carlisle Coatings & Waterproofing, Inc; R2+ Silver: www.carlisleccw.com/#sle.
 - c. Hunter Panels; H-Shield: www.hunterpanels.com/#sle.
 - d. Johns Manville; AP Foil25: www.jm.com/#sle.
 - e. Rmax Inc; ECOMAXci FR: www.rmax.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.

2.03 MINERAL FIBER BLANKET INSULATION MATERIALS

- A. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - 3. Thickness: See wall types. ___ inch.
 - 4. Products:
 - a. Johns Manville; MinWool Sound Attenuation Fire Batts (Interior wall cavity)
 - b. ROCKWOOL; AFB: www.rockwool.com/#sle. (Interior wall cavity)
 - c. ROCKWOOL; AFB evo™: www.rockwool.com/#sle. (Interior wall cavity)
 - d. Thermafiber, Inc; SAFB: www.thermafiber.com/#sle. (Interior wall cavity)
 - e. Thermafiber, Inc; SAFB FF: www.thermafiber.com/#sle. (Interior wall cavity)

2.04 ACCESSORIES

- A. Sill Plate Sealer: Closed-cell foam tape with rubberized adhesive membrane; bridges gap between foundation structure and sill plate or skirt board.
 - 1. Width: 5-1/2 inches.
 - 2. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 30 days of weather exposure.
- B. Support for Cladding and Continuous Insulation: Continuous thermal Z-girts.
 - 1. Fiberglass reinforced plastic (FRP) girts that provide cladding attachment support for exterior wall cladding, brick veneer, CMU veneer, metal wall panels, siding, and ____.
 - 2. Fasteners: As recommended by clip manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Install boards horizontally on foundation perimeter.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.
 - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Install rigid insulation directly to exterior grade sheathing at 16 inches on center with manufacturer recommended mechanical fasteners, and tape joints with manufacturer's minimum 4 inches wide sealant tape; comply with ASTM E2357.
- B. Install boards horizontally on walls.
 - 1. Install in running bond pattern.
 - 2. Butt edges and ends tightly to adjacent boards and protrusions.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

- D. Place 6 inches wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames, and tape seal in place to ensure continuity of vapor retarder and air seal.

3.04 BOARD INSTALLATION USING CLADDING AND CONTINUOUS INSULATION SUPPORTS

- A. Install supports in accordance with manufacturer's installation instructions.
- B. Install supports in compliance with system orientation, sizes, and locations as indicated on drawings and in accordance with approved shop drawings.
- C. Install supports to fill in exterior wall spaces without gaps or voids in insulation.
- D. Trim insulation neatly to fit spaces and provide a continuous thermal layer.

3.05 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in interior wall spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.06 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.

3.07 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 2100

**SECTION 07 2119
FOAMED-IN-PLACE INSULATION**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Foamed-in-place insulation.

1.02 REFERENCE STANDARDS

- A. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2025.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- D. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- E. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.
- F. NFPA 275 - Standard Method of Fire Tests for the Evaluation of Thermal Barriers; 2022.
- G. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- H. UL 1040 - Standard for Safety Fire Test of Insulated Wall Construction; Current Edition, Including All Revisions.
- I. UL 1715 - Standard for Safety Fire Test of Interior Finish Material; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.
- C. Certificates: Certify that products of this section meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
- E. Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- F. Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

1.06 FIELD CONDITIONS

- A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.
- B. Do not apply foam when temperature is within 5 degrees F of dew point.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Foamed-In-Place Insulation:
 - 1. BASF Corporation; WALLTITE US Series Closed Cell: www.spf.basf.com/#sle.
 - 2. Carlisle Spray Foam Insulation; ____: www.carlislesfi.com/#sle.
 - 3. Gaco Western; ____: www.gaco.com/#sle.
 - 4. Henry, a Carlisle Company: www.henry.com/#sle.
 - 5. Huntsman Building Solutions: www.huntsmanbuildingsolutions.com/#sle.
 - 6. Johns Manville; JM No Mix Open Cell (NMOC): www.jm.com/#sle.

2.02 MATERIALS

- A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
 - 1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
 - a. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.
 - 2. Water Vapor Permeance: Vapor retarder; 2 perms, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
 - 3. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
 - 4. Air Permeance: 0.04 cfm per square foot, maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf.
 - 5. Closed Cell Content: At least 90 percent.
 - 6. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.03 ACCESSORIES

- A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify work within construction spaces or crevices is complete before insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.02 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation by spray method, to a uniform monolithic density without voids.

- C. Apply to achieve a thermal resistance R-value that meets current codes..
- D. Patch damaged areas.
- E. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.
- F. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.04 PROTECTION

- A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 2119

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SECTION 07 2600 VAPOR RETARDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor retarders.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.
- B. Section 06 1000 - Rough Carpentry: Vapor retarders on exterior wall sheathing.
- C. Section 07 2100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
- D. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with vapor retarders.

1.03 DEFINITIONS

- A. Vapor Retarder: Airtight barrier made of material that is relatively water vapor impermeable, to degree specified, with seams and joints sealed to adjacent surfaces.
- B. Vapor Retarder Class: A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class is defined using Procedure A, Desiccant Method at 73 degrees F and 50 percent Relative Humidity (RH), in accordance with ASTM E96/E96M and ICC (IBC)-2018, as follows:
 - 1. Class I: 0.1 perm or less.
 - 2. Class II: Greater than 0.1 perm to 1.0 perm.
 - 3. Class III: Greater than 1.0 perm to 10 perms.

1.04 REFERENCE STANDARDS

- A. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; 2016 (Reapproved 2023).
- B. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- C. ICC (IBC)-2018 - International Building Code; 2018.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions.
- D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.06 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Construct vapor retarder mock-up, 14 feet long by 14 feet wide, indicating splice joints, outside edges, and any penetrations .
- C. Locate where directed.
- D. Mock-up may remain as part of work.

1.07 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS**2.01 VAPOR RETARDERS**

- A. Underslab Vapor Retarders: See Section 03 3000.
- B. Vapor Retarder Sheet: Polyethylene sheeting complying with ASTM D4397, clear colored.
 - 1. Thickness: 10 mil, 0.010 inch, nominal.
 - 2. Seam and Perimeter Tape: Polyethylene self-adhering type, mesh reinforced, 2 inches wide; compatible with sheet material, as approved by manufacturer.

2.02 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Vapor Retarder and Adjacent Substrates: As indicated, complying with vapor retarder manufacturer's installation instructions.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Vapor Retarders: Install continuous airtight barrier over surfaces indicated, with sealed seams and sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Mechanically Fastened Sheets - Vapor Retarder On Interior:
 - 1. When insulation is installed within assembly, install vapor retarder over insulation.
 - 2. Anchor to wood framing using large-headed nails or staples at 12 to 18 inches on center along each framing member covered; cover fasteners with seam tape.
 - 3. Anchor to metal framing using seam tape, adhering at least one-half of tape width to metal substrate.
 - 4. Seal seams, laps, perimeter edges, penetrations, tears, and cuts with self-adhesive tape, providing an airtight seal.
 - 5. Locate laps at framing members; at laps fasten one sheet to framing member then tape overlapping sheet to first sheet in shingle fashion to shed water.
 - 6. Seal entire perimeter to structure, window and door frames, and other penetrations.
 - 7. Where conduits, pipes, wires, ducts, outlet boxes, and other items are installed within insulation cavity, pass vapor retarder sheet behind these items and over insulation to maintain airtight seal.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Do not cover installed vapor retarders until required inspections have been completed.
- C. Take digital photographs of each portion of installation prior to covering up vapor retarders.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07 2600

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SECTION 07 2700 AIR BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air barriers.

1.02 RELATED REQUIREMENTS

- A. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with air barriers.

1.03 DEFINITIONS

- A. Air Barrier: Airtight barrier made of material that is virtually air impermeable but water vapor permeable, both to amount as specified, with sealed seams and sealed joints to adjacent surfaces.

1.04 REFERENCE STANDARDS

- A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- B. ASTM D751 - Standard Test Methods for Coated Fabrics; 2019.
- C. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2025).
- D. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- G. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- H. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions.
- D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
- E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification; keep copies of each contractor accreditation and installer certification on site during and after installation, and present on-site documentation upon request.
- G. Manufacturer's qualification statement.

H. Installer's qualification statement.

1.06 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Evaluated Air Barrier Assemblies; www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience, and approved by manufacturer.
- C. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Construct air barrier mock-up, 10 feet long by 10 feet wide, indicating conditions of sealing joints and wrapping typical opening..
- C. Locate where directed.
- D. Mock-up may remain as part of work.

1.08 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR PERMEABLE)

- A. Air Barrier Sheet, Mechanically Fastened:
 - 1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
 - 2. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
 - 3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
 - 4. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, Class A, when tested in accordance with ASTM E84.
 - 5. Seam and Perimeter Tape: Polyethylene self-adhering type, mesh reinforced, 2-1/2 inches wide, compatible with sheet material; unless otherwise indicated.
- B. Air Barrier Sheet, Self-Adhered:
 - 1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
 - 2. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
 - 3. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).
 - 4. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
 - 5. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.

6. Seam and Perimeter Tape: As recommended by sheet manufacturer.
- C. Air Barrier, Fluid-Applied: Vapor semipermeable, elastomeric waterproofing.
 1. Air Barrier Coating:
 - a. Material: 100 percent silicone.
 - b. Dry Film Thickness (DFT): 20 mil, 0.020 inch, minimum.
 - c. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
 - d. Water Vapor Permeance: 11 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method, at 73.4 degrees F.
 - e. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
 - f. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
 - g. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
 - h. Comply with NFPA 285 requirements for wall assembly.
 - i. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
 - j. Sealants, Tapes and Accessories: As approved by coating manufacturer.

2.02 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.
- B. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrate and air barrier materials.
 1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch, nominal thickness.
 2. Color: Green.
 3. Elongation: 1,300 percent, measured in accordance with ASTM D412.
 4. Peel Adhesion: 28 lb/inch, minimum, when tested in accordance with ASTM D903.
 5. Hydrostatic Head Pressure: Resists head pressure of 57 feet, maximum, when tested in accordance with ASTM D751.
 6. Comply with NFPA 285 requirements for wall assembly.
 7. Products:
 - a. Karnak Corporation; 323 K-NRG Gap Seal FR: www.karnakcorp.com/#sle.
 - b. Rubber Polymer Company: www.rubrwall.com/#sle.
 - c. TYPAR; TYPAR HD Heavy-Duty Sealant: www.typar.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Primer: Liquid applied polymer.
 1. Color: Green.
 2. Elongation: 1,300 percent, measured in accordance with ASTM D412.
- D. Flexible Flashing: Self-adhesive sheet flashing.
 1. Width: 4 inches.
 2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 180 days of weather exposure.
- E. Threshold Flashing: Closed-cell foam tape with rubberized adhesive membrane; seals subfloor under threshold.
 1. Width: 5-1/2 inches.
 2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 180 days of weather exposure.

- F. Liquid Flashing: One part, fast curing, nonsag, gun grade, trowelable.
- G. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready for work of this section.
- B. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
- C. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Mechanically Fastened Sheets - On Exterior:
 - 1. Install sheets shingle fashion to shed water, with seams generally horizontal.
 - 2. Overlap seams as recommended by manufacturer, 6 inches, minimum.
 - 3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches, minimum.
 - 4. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
 - 5. Install air barrier underneath jamb flashings.
 - 6. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.
- E. Self-Adhered Sheets:
 - 1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
 - 2. Lap sheets shingle fashion to shed water and seal laps airtight.
 - 3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
 - 4. Use same material, or other material approved by sheet manufacturer, to seal to adjacent substrates, and as flashing.
 - 5. At wide joints, provide extra flexible membrane allowing joint movement.
- F. Fluid-Applied Coatings or Membranes:
 - 1. Prepare substrate in accordance with manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
 - 2. Use flashing to seal to adjacent construction and to bridge joints in coating substrate.
- G. Openings and Penetrations in Exterior Air Barriers:

1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto air barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
4. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements
- B. Do not cover installed air barriers until required inspections have been completed.
- C. Obtain approval of installation procedures from air barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- D. Take digital photographs of each portion of installation prior to covering up air barriers.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07 2700

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**SECTION 07 4213
ALUMINUM COMPOSITE WALL PANELS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes metal composite material wall panels.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include fabrication and installation layouts of metal composite material panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.
- C. Samples: For each type of metal composite material panel indicated.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 MOCK-UPS

- A. See Section 01 4000-Quality Requirements for additional requirements.
- B. Construct 6 feet by 6 feet mock-up; include panel system, glazing, attachments to building frame, associated vapor retarder and air seal materials, weep drainage system, sealants and seals, and related insulation in mock-up.
- C. Locate where directed by Architect.
- D. Mock-up may remain as part of work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419-Construction Waste Management and Disposal for packaging waste requirements.
- B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- C. Store prefinished material off ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage
- D. Prevent contact with materials that cause discoloration or staining.

1.8 FIELD CONDITIONS

- A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite material panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal composite material panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS**2.1 METAL COMPOSITE MATERIAL WALL PANELS**

- A. Metal Composite Material Wall Panel Systems: Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assemblies components, panel stiffeners, and accessories required for weathertight system.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Laminators Inc, Omega Lite + CI Rigid Insulation Panel or comparable product by one of the following:
 - a. ATAS International, SterraCore.
 - b. Alpolic
- B. Aluminum-Faced Composite Wall Panels : Formed with 0.020-inch- thick, anodized aluminum sheet facings.

1. Panel Thickness: 6mm min.
2. Core: Standard.
3. Exterior Finish: Two-coat fluoropolymer.
 - a. Color: As selected by Architect from manufacturer's full range, see exterior elevations for initial color selections.
- C. Attachment Assembly Components: Formed from extruded aluminum.
- D. Installation method: 1-piece tight fitting molding with Reveal-H.
- E. Outside Corners to be Fabricated, in lieu of utilizing molding.

2.2 PERFORMANCE REQUIREMENTS

- A. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
 1. Design Wind Pressure: In accordance with local building code.
 2. Maximum deflection of perimeter framing member of $L/175$ normal to plane of wall; maximum deflection of individual panels of $L/60$.
 3. Maximum anchor deflection of $1/16$ inch at connection points of framing members to anchors.
- B. Structural Performance: Provide metal composite material panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 330:
- C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:
- D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- F. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
- G. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
- H. Provide continuity of air barrier seal at building enclosure elements in accordance with requirements; see Section 07 2700.
- I. Provide continuity of vapor retarder seal at building enclosure elements in accordance with requirements; see Section 07 2600.

- J. Provide continuity of weather barrier seal at building enclosure elements in accordance with requirements; see Section 07 2500.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite material panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite material panels unless otherwise indicated.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite material panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite material panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal composite material panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: ASTM C 920; as recommended in writing by metal composite material panel manufacturer. Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

2.4 FABRICATION

- A. General: Fabricate and finish metal composite material panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal composite material panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

2.5 FINISHES

- A. Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal composite material panel manufacturer's written recommendations.

3.2 METAL COMPOSITE MATERIAL PANEL INSTALLATION

- A. Attachment Assembly, General: Install attachment assembly required to support metal composite material wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
 1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
- B. Installation: Attach metal composite material wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.
 1. Wet Seal Systems: Seal horizontal and vertical joints between adjacent metal composite material wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 07 9200 "Joint Sealants."
 2. **Dry Seal Systems:** Seal horizontal and vertical joints between adjacent metal composite material wall panels with manufacturer's standard gasket system.
 3. Rainscreen Systems: Do not apply sealants to joints unless otherwise indicated.
- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
- D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
- E. Install panels on walls and soffits in accordance with manufacturer's instructions.
- F. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint; allow to dry prior to wall panel installation.
- G. Provide expansion and control joints where indicated on drawings.
- H. Use concealed fasteners unless otherwise indicated by Architect.

- I. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.3 TOLERANCES

- A. Offset From True Alignment Between Adjacent Members Abutting or In Line: 1/16 inch, maximum.
- B. Variation from Plane or Location As Indicated on Drawings: 1/4 inch in 20 ft, maximum.

3.4 CLEANING

- A. See Section 01 7000-Execution and Closeout Requirements for additional requirements.
- B. Remove site cuttings from finish surfaces.
- C. Remove protective material from wall panel surfaces.
- D. Upon completion of installation, completely clean prefinished aluminum surfaces in accordance with AAMA 609 & 610.

3.5 PROTECTION

- A. Protect metal wall panels until completion of project.
- B. Touch up, repair, or replace damaged wall panels and accessories before Date of Substantial Completion.

END OF SECTION

SECTION 07 5300
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Elastomeric roofing membrane application.
- B. Insulation, flat and tapered.
- C. Vapor retarder.
- D. Cover boards.
- E. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

- A. Section 05 3100 - Steel Decking: Placement of acoustical insulation for deck flutes.
- B. Section 06 1000 - Rough Carpentry: Wood cant strips.
- C. Section 07 7100 - Roof Specialties: Prefabricated roofing expansion joint flashing.

1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2024.
- C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
- D. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- E. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- F. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).
- G. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2024.
- H. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- I. ASTM D4263 - Standard Practice for Indicating Moisture in Concrete by the Plastic Sheet Method; 2024.
- J. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).
- K. ASTM D7877 - Standard Guide for Electronic Methods for Detecting and Locating Leaks in Roofing and Waterproofing Membranes; 2025.
- L. ASTM D8231 - Standard Practice for the Use of a Low-Voltage Electronic Scanning System for Detecting and Locating Breaches in Roofing and Waterproofing Membranes; 2024a.
- M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- N. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

- O. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2024.
- P. FM (AG) - FM Approval Guide; Current Edition.
- Q. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2026).
- R. NRCA (RM) - The NRCA Roofing Manual; 2026.
- S. NRCA (WM) - The NRCA Waterproofing Manual; 2021.
- T. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of associated counterflashings installed under other sections.
- B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and R-Value of each roof area .
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.
- E. Samples for Verification: Submit two samples 6 by 6 inches in size illustrating insulation.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Installation Instructions: Indicate membrane seaming precautions, special procedures, and perimeter conditions requiring special attention.
- H. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- I. Manufacturer's qualification statement.
- J. Installer's qualification statement.
- K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- L. Submit installer's written verification that installation complies with warranty conditions for waterproof membrane.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience, and approved by manufacturer.
- C. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and an experienced superintendent on the job at all times roofing work is in progress.

- D. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the Architect and building owner seventy-two (72) hours prior to the manufacturer's final inspection.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.
- C. Store materials in weather protected environment, clear of ground and moisture.
- D. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
- E. Protect foam insulation from direct exposure to sunlight.

1.08 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above manufacturer's threshold for degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a two year period after Date of Substantial Completion.
- C. Provide twenty (20) year manufacturer's material and labor warranty to cover failure to prevent penetration of water, with no dollar limitation, and wind speed coverage up to 72 mph.
- D. Unless otherwise approved by the Architect and accepted by the membrane manufacturer, all products (including insulation, fasteners and fastening plates) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. EPDM Membrane Materials:
 - 1. Carlisle SynTec Systems; Sure-Seal EPDM: www.carlisle-syntec.com/#sle.
 - 2. Elevate; RubberGard EPDM: www.holcimelevate.com/#sle.
 - 3. GenFlex Roofing Systems, LLC; GenFlex II EPDM: www.genflex.com/#sle.
 - 4. Johns Manville; JM EPDM: www.jm.com/#sle.
 - 5. Versico Roofing Systems; VersiGard EPDM: www.versico.com/#sle.
 - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation (Supplied and warranted by roofing membrane manufacturer):
 - 1. GAF: www.gaf.com/#sle.

2. Hunter Panels: www.hunterpanels.com/#sle.
3. Versico Roofing Systems; ____: www.versico.com/#sle.
4. Elevate: www.holcimelevate.com..
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOFING - UNBALLASTED APPLICATIONS

- A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over vapor retarder and insulation.
- B. Roofing Assembly Requirements:
 1. Roof Covering External Fire Resistance Classification: UL (DIR) certified Class B.
 2. Factory Mutual Classification: Class 1 and windstorm resistance of 1-90, in accordance with FM DS 1-28.
 3. Insulation Thermal Resistance (R-Value): R-36 min. 5.7 per inch, minimum; provide insulation of thickness required. At tapered insulation, provide R-36 min. average per each individual area of tapered roof insulation.
- C. Acceptable Insulation Types - Constant Thickness Application:
 1. Minimum 2 layers of polyisocyanurate board.
- D. Acceptable Insulation Types - Tapered Application:
 1. Tapered polyisocyanurate board covered with uniform thickness glass fiber or composite board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: Ethylene-propylene-diene-monomer (EPDM); non-reinforced; complying with minimum properties of ASTM D4637/D4637M.
 1. Thickness: 60 mil, 0.060 inch, minimum.
 2. Sheet Width: 120 inches, minimum; factory fabricate into widest possible sheets.
 - a. Adhered Application: Limit width to 120 inches, maximum, when ambient temperatures are less than 40 degrees F for extended period of time during installation.
 3. Color: Black.
 4. Tensile Strength: 1305 psi, minimum, measured in accordance with ASTM D412.
 5. Ultimate Elongation: 300 percent, minimum, measured in accordance with ASTM D412.
 6. Tear Strength: 150 lbf per inch, measured in accordance with ASTM D624.
 7. Water Vapor Permeability: ____ perm inch, measured in accordance with ASTM E96/E96M.
 8. Brittleness Temperature: -49 degrees F, measured in accordance with ASTM D746.
- B. Seaming Materials: 3" or 6" wide by 100' long splice tape used for splicing adjoining sections of EPDM membrane..
- C. Membrane Fasteners: As recommended by and approved by membrane manufacturer.
- D. Vapor Retarder: Plastic, complying with requirements of fire rating classification; compatible with roofing and insulation materials.
 1. Fire-retardant adhesive.
 2. Vapor Permeability: ____ perm inch, measured in accordance with ASTM E96/E96M.
- E. Flexible Flashing Material: Same material as membrane.
 1. Thickness: 60 mil.
 2. Color: Black.

2.04 COVER BOARDS

- A. Cover Boards: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
 - 1. Thickness: 1/2 inch, fire-resistant.
 - 2. Products:
 - a. Georgia-Pacific; DensDeck Prime: www.densdeck.com/#sle.
 - b. _____.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

2.05 INSULATION

- A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
 - 1. Classifications:
 - a. Type II: Faced with either cellulosic facers or glass fiber mat facers on both major surfaces of the core foam.
 - 1) Class 1 - Faced with glass fiber reinforced cellulosic facers on both major surfaces of the core foam.
 - 2) Compressive Strength: Classes 1-2-3, Grade 2 - 20 psi (138 kPa), minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inches thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F.
 - 2. Board Size: 48 by 96 inches.
 - 3. Board Thickness: 2.0 inch min. per layer.
 - 4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
 - 5. Board Edges: Square.

2.06 ACCESSORIES

- A. Prefabricated Roofing Expansion Joint Flashing: See Section 07 7100.
- B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; elastomeric material compatible with membrane.
- C. Insulation Fasteners: Appropriate for purpose intended.
 - 1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
- D. Membrane Adhesive: As recommended by membrane manufacturer.
- E. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- F. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- G. Insulation Adhesive: As recommended by insulation manufacturer.
- H. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.
- I. Sealants: As recommended by membrane manufacturer.
- J. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Asphaltic with mineral granule surface or Roofing membrane manufacturer's standard.
 - 2. Size: 24 by 24 inches.
 - 3. Surface Color: Match membrane.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips and reglets are in place.

3.02 INSTALLATION - VAPOR RETARDER AND INSULATION, UNDER MEMBRANE

- A. Install vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
 - 1. Extend vapor retarder under cant strips and blocking to deck edge.
 - 2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
- B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.
- C. Attachment of Insulation:
 - 1. Mechanically fasten _____ insulation to deck in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.
- D. Cover Boards: Mechanically fasten cover boards in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.
- E. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.
- F. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- G. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
- H. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- I. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 24 inches.
- J. Do not apply more insulation than can be covered with membrane in same day.

3.03 INSTALLATION - MEMBRANE

- A. Install elastomeric membrane roofing system in accordance with manufacturer's recommendations and NRCA (WM) or NRCA (RM) applicable requirements.
- B. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- C. Shingle joints on sloped substrate in direction of drainage.
- D. Fully Adhered Application: Apply adhesive to substrate at rate of manufacturer's recommended gal per 100 sq ft. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- E. Overlap edges and ends and seal seams by solvent welding, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

- F. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 6 inches onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to reglets.
 - 3. Secure flashing to nailing strips at 4 inches on center.
 - 4. Insert flashing into reglets and secure.
- G. Around roof penetrations, seal flanges and flashings with flexible flashing.
- H. Install roofing expansion joints where indicated. Make joints watertight.
 - 1. Install prefabricated joint components in accordance with manufacturer's instructions.
- I. Coordinate installation of roof drains and sumps and related flashings.
- J. Coordinate installation of associated counterflashings installed under other sections.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Owner will provide testing and inspection services, and Contractor to provide temporary construction and materials for testing in accordance with requirements.
- C. Provide manufacture's requirement for warranties for on-site attendance of roofing and insulation manufacturer's representative during installation of this work.

3.05 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 07 5300

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SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, exterior penetrations, and other items indicated in Schedule.
- B. Sealants for joints within sheet metal fabrications.
- C. Precast concrete splash pads.

1.02 REFERENCE STANDARDS

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- B. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2025.
- C. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement; 2025.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two samples, 3 by 5 inches in size, illustrating metal finish color.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.
- B. Fabricate and install roof edge profiles to comply with ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- C. Maintain one copy of each document on site.
- D. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that could cause discoloration or staining.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 20 years:
 - 1. Chalking: No more than that represented by a No. 8 rating based on ASTM D4214.

2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sheet Metal Flashing and Trim:
 1. ALUCOBOND by 3A Composites USA; ALUCOBOND AXCENT: www.alucobondusa.com/#sle.
 2. Fairview Architectural LLC: www.fairview-na.com/#sle.
 3. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 4. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 5. Tamlyn; XtremeColor Flashing: www.tamlyn.com/#sle.
 6. Taylor Metal Products: www.taylormetal.com/#sle.
 7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
 1. Provide custom profiles where indicated.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- G. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.03 GUTTERS AND DOWNSPOUTS

- A. Gutters: SMACNA (ASMM) Rectangular profile.
- B. Downspouts: Rectangular profile.
- C. Accessories: Profiled to suit gutters and downspouts.
 1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
 2. Gutter Supports: Brackets.
 3. Downspout Supports: Brackets.
- D. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3,000 psi at 28 days, with minimum 5 percent air entrainment.
- E. Downspout Boots: Steel.
- F. Downspout Extenders: Same material and finish as downspouts.
- G. Seal metal joints.

2.04 FLASHING

- A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

2.05 ACCESSORIES

- A. Fasteners: Stainless steel, with soft neoprene washers.
- B. Underlayment: ASTM D226/D226M, organic roofing felt, Type II, No. 30.
- C. Slip Sheet: Rosin-sized sheathing paper.
- D. Primer Type: Zinc chromate.
- E. Protective Backing Paint: Zinc molybdate alkyd.
- F. Concealed Sealants: Non-curing butyl sealant.
- G. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- H. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.
- I. Reglets: Surface-mounted type, galvanized steel; face and ends covered with plastic tape.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.03 INSTALLATION

- A. Insert flashings into reglets to form tight fit; secure in place with plastic wedges; seal flashings into reglets with sealant.
- B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Exterior Flashing Receivers: Install in accordance with manufacturer's recommendations, and in proper relationship with adjacent construction, and as follows:
 - 1. Secure receiver at perimeter of wall opening with adhesives or fasteners.
- F. Seal metal joints watertight.
- G. Secure gutters and downspouts in place with concealed fasteners.
- H. Slope gutters 1/4 inch per 10 feet, minimum.
- I. Connect downspouts to downspout boots, and grout connection watertight.
- J. Set splash pads under downspouts, and set in place with _____.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for field inspection requirements.

- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.05 SCHEDULE

- A. Coping, Cap, Parapet, Sill and Ledge Flashings:

END OF SECTION 07 6200

**SECTION 07 7100
ROOF SPECIALTIES**

PART 1 GENERAL**1.01 SECTION INCLUDES****1.02 RELATED REQUIREMENTS****1.03 REFERENCE STANDARDS**

- A. NRCA (RM) - The NRCA Roofing Manual; 2026.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Samples: Submit two appropriately sized samples of coping and gravel stop.
- E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

PART 2 PRODUCTS**2.01 MANUFACTURERS****2.02 COMPONENTS****2.03 ACCESSORIES**

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Seal joints within components when required by component manufacturer.
- C. Anchor components securely.
- D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- F. Coordinate installation of flashing flanges into reglets.

END OF SECTION 07 7100

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**SECTION 07 7123
MANUFACTURED GUTTERS AND DOWNSPOUTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Gutters and downspouts.
- B. Downspout boots.
- C. Splash guards.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Downspout boots.
- B. Section 07 6200 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2026.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2026.
- C. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.
- D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- E. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2025.
- F. CDA A4050 - Copper in Architecture - Handbook; Current Edition.
- G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on prefabricated components.
- C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- D. Samples: Two sample assemblies, 12 inches long, illustrating component design, finish, color, and configuration.
- E. Manufacturer's installation instructions.
- F. Executed warranty.

1.05 QUALITY ASSURANCE

- A. Documents at Project Site: Maintain at project site one copy of shop drawings and reference standard documents containing execution requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.

- B. Stack material to prevent twisting, bending, or abrasion and to provide ventilation. Slope to drain.
- C. Prevent contact with materials that cause discoloration, staining, or damage.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for material and workmanship. Complete forms in Owner's name and register with manufacturer.
- C. Special Warranty: Provide 30-year warranty for wind damage commencing on Date of Substantial Completion. Complete forms in Owner's name and register with warrantor.
- D. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior PVDF finish. Include provision for replacing units with excessive fading or chalking. Complete forms in Owner's name and register with manufacturer.
 - 1. Color Retention: No fading or color change exceeding 5 Hunter color difference units, calculated in accordance with ASTM D2244.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gutters and Downspouts:
 - 1. Alside, Inc: www.alside.com/#sle.
 - 2. ATAS International, Inc: www.atas.com/#sle.
 - 3. Cheney Flashing Company: www.cheneyflashing.com/#sle.
 - 4. Custom-Bilt Metals: www.custombiltmetals.com/#sle.
 - 5. Drexel Metals Inc: www.drexmet.com/#sle.
 - 6. Hickman Edge Systems; Wind Resistant Gutter: www.hickmanedgesystems.com/#sle.
 - 7. Metal-Era Inc; Seal-Tite WR Gutter: www.metalera.com/#sle.
 - 8. SAF Perimeter Systems, a division of Southern Aluminum Finishing Company, Inc: www.saf.com/#sle.
 - 9. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESIGN CRITERIA

- A. Comply with SMACNA (ASMM) for sizing components for rainfall intensity determined by storm occurrence of 1 in 5 years.
- B. Comply with applicable code for size and method of rainwater discharge.

2.03 GUTTERS AND DOWNSPOUTS

- A. Gutters: SMACNA (ASMM) rectangular profile.
- B. Downspouts: Profile as indicated in construction documents.
- C. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14-inch long legs on corner pieces.
 - 1. Scuppers and Conductor Heads: Welded watertight. Set in sealant and secured to structure.
- D. Anchors and Supports: Profiled to suit gutters and downspouts.
 - 1. Anchoring Devices: Type recommended by manufacturer.
 - 2. Gutter Supports: Brackets.
 - 3. Downspout Supports: Brackets.

- E. Fasteners: Galvanized steel, with soft neoprene washers.

2.04 DOWNSPOUT BOOTS

- A. See Section 05 5000.
- B. Description: Smooth interior without boxed corners or choke points; include integral lug slots and on-body cleanout and cover with neoprene gaskets.
 - 1. Configuration: Angular.
 - 2. Material: Cast iron; ASTM A48/A48M; casting thickness 3/8 inch, minimum.
 - 3. Finish: Manufacturer's standard factory-applied powder coat finish.
 - 4. Color: As selected by Architect from manufacturer's standard range.
 - 5. Color: _____.
 - 6. Accessories: Manufacturer's standard stainless steel fasteners, stainless steel building wall anchors, and rubber coupling.
 - 7. Products:
 - a. Downspoutboots.com, a division of J. R. Hoe & Sons:
www.downspoutboots.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 SPLASH GUARDS

- A. Splash Pans: Same metal type as downspouts, formed to 12 by 18 inches in size; rolled sides 1 inch high for inverted pan placement.
- B. Splash Pads: Precast concrete type, profiles sizes as indicated on drawings; minimum 3,000 psi compressive strength at 28 days, with minimum 5 percent air entrainment.

2.06 SHOP FABRICATION

- A. Form gutters and downspouts of profiles and size indicated in construction documents.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints; comply with CDA A4050
- D. Hem exposed edges of metal.
- E. Fabricate gutter and downspout accessories; seal watertight.

2.07 FINISHES

- A. Prefinished Aluminum Sheets: Factory-applied topcoat systems applied to aluminum flat sheet substrates prior to fabrication by coil coating; topcoat systems consist of primers and organic topcoats on exposed side and backing coats on unexposed side.
 - 1. Aluminum Sheet Substrates: ASTM B209/B209M, alloy and temper as recommended by manufacturer for application.
 - 2. High-Performance Organic Coating System: Comply with AAMA 2604 for aluminum preparation, pretreatment, primer, and finish coat system; provide thermally cured, 50-percent PVDF or silicone-modified polyester systems; tested for weathering for 5 years with 5 delta units color change maximum.
 - 3. Superior Performance Organic Coating System: Comply with AAMA 2605 for aluminum preparation, pretreatment, primer, and finish coat system; provide thermally cured 70-percent PVDF fluoropolymer systems; tested for weathering for 10 years with 5 delta units color change maximum.

2.08 MATERIALS

- A. Prefinished Aluminum Sheet: ASTM B209/B209M; 0.032 inch thick.
 - 1. Finish: Plain, shop precoated with modified silicone coating.
 - 2. Color: As indicated on drawings.

2.09 ACCESSORIES

- A. Flashing: See Section 07 6200.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and interfaces with other work.
- B. Verify surfaces are acceptable for product installation in accordance with manufacturer's written instructions.
- C. Notify Architect in writing of conditions detrimental to completion of work. Do not proceed with installation until detrimental conditions are corrected.

3.02 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Slope gutters 1/4 inch per 10 feet, minimum.
- C. Connect downspouts to downspout boots at 12 inches above grade. Grout connection watertight.
- D. Set splash pans under downspouts.

END OF SECTION 07 7123

**SECTION 07 7200
ROOF ACCESSORIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Roof hatches.

1.02 RELATED REQUIREMENTS

- A. Section 07 7100 - Roof Specialties: Other manufactured roof specialty items.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.

PART 2 PRODUCTS**2.01 ROOF HATCHES AND VENTS**

- A. Roof Hatch Manufacturers:
 - 1. Bilco Company; S-50TB-36-30: www.bilco.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

- A. Clean installed work to like-new condition.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 7200

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SECTION 07 9200 JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

- A. 06 4100- Architectural Wood Casework
- B. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- C. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
- B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- C. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).
- D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2024.
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- H. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.
- I. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.
- J. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
- K. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2025).
- L. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- M. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.

3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 4. Substrates the product should not be used on.
 5. Substrates for which use of primer is required.
 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 7. Sample product warranty.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
- F. Installation Plan: Submit at least four weeks prior to start of installation.
- G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
- H. Installation Log: Submit filled-out log for each length or instance of sealant installed.
- I. Manufacturer's qualification statement.
- J. Installer's qualification statement.
- K. Executed warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
1. Adhesion Testing: In accordance with ASTM C794.
 2. Compatibility Testing: In accordance with ASTM C1087.
 3. Allow sufficient time for testing to avoid delaying the work.
 4. Deliver sufficient samples to manufacturer for testing.
 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
 6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.
- D. Installation Plan: Include schedule of sealed joints, including the following:
1. Joint width indicated in Contract Documents.
 2. Joint depth indicated in Contract Documents; to face of backing material at centerline of joint.
 3. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgment that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
 4. Approximate date of installation, for evaluation of thermal movement influence.

5. Installation Log Form: Include the following data fields, with known information filled out.
 - a. Substrates.
 - b. Sealant used.
 - c. Stated movement capability of sealant.
 - d. Primer to be used, or indicate no primer is used.
 - e. Size and actual backing material used.
 - f. Date of installation.
 - g. Name of installer.
 - h. Actual joint width; provide space to indicate maximum and minimum width.
 - i. Actual joint depth to face of backing material at centerline of joint.
 - j. Air temperature.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Nonsag Sealants:
 1. Adfast USA Inc: www.adfastcorp.com/#sle.
 2. Bostik Inc: www.bostik-us.com/#sle.
 3. Dow: www.dow.com/#sle.
 4. Henry, a Carlisle Company: www.henry.com/#sle.
 5. Hilti, Inc: www.hilti.com/#sle.
 6. Pecora Corporation: www.pecora.com/#sle.
 7. QUIKRETE Companies: www.quikrete.com/#sle.
 8. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 9. Sika Corporation: usa.sika.com/#sle.
 10. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 11. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
 12. Substitutions: See Section 01 6000 - Product Requirements.
- B. Self-Leveling Sealants:
 1. Bostik Inc: www.bostik-us.com/#sle.
 2. Dow: www.dow.com/#sle.
 3. Pecora Corporation: www.pecora.com/#sle.
 4. QUIKRETE Companies: www.quikrete.com/#sle.
 5. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 6. Sika Corporation: usa.sika.com/#sle.
 7. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 8. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
 9. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

- A. Scope:
 1. Exterior Joints:
 - a. Seal the following joints:

- 1) Wall expansion and control joints.
 - 2) Joints between doors, windows, and other frames or adjacent construction.
 - 3) Joints between different exposed materials.
 - 4) Seal open joints except open joints indicated on drawings as not sealed..
2. Interior Joints:
 - a. Do not seal interior joints indicated on drawings as not sealed.
 - b. Seal the following joints:
 - 1) Joints between door frames and window frames and adjacent construction.
 - 2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
 - 3) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.
 - 4) Seal open joints except specific open joints indicated on drawings as not sealed..
3. Do Not Seal:
 - a. Intentional weep holes in masonry.
 - b. Joints indicated to be covered with manufactured expansion joint cover assemblies or other sealing devices.
 - c. Joints where sealant installation is specified in other sections.

2.03 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 NONSAG JOINT SEALANTS

- A. Type General Purpose Exterior Sealant - Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; not expected to withstand continuous water immersion or traffic.
 1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
 2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 5. Color: To be selected by Architect from manufacturer's full range.
 6. Cure Type: Single-component, neutral moisture curing.
 7. Products:
 - a. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
 - b. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle.
 - c. Pecora Corporation; Pecora 864 NST (Non-Staining Technology): www.pecora.com/#sle.
 - d. Sika Corporation; Sikasil WS-290: usa.sika.com/#sle.
 - e. Tremco Commercial Sealants & Waterproofing; Spectrem 1: www.tremcosealants.com/#sle.
 - f. Tremco Commercial Sealants & Waterproofing; Spectrem 2: www.tremcosealants.com/#sle.
 - g. Tremco Commercial Sealants & Waterproofing; Spectrem 3: www.tremcosealants.com/#sle.
 - h. Tremco Commercial Sealants & Waterproofing; Tremsil 200: www.tremcosealants.com/#sle.

- i. Tremco Commercial Sealants & Waterproofing; Tremsil 400:
www.tremcosealants.com/#sle.
 - j. Substitutions: See Section 01 6000 - Product Requirements.
 8. Applications:
 - a. Wall expansion and control joints.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.
 - d. Openings below ledge angles in masonry.
 - e. Control, expansion, and soft joints in masonry.
 - f. Joints between concrete and other materials.
- B. Type Sanitary Sealant - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
 1. Color: As selected by Architect from Manufacturer's full range .
 2. Products:
 - a. Dow Corning Corporation; 786 Mildew Resistant.
 - b. GE Advanced Materials - Silicones; Sanitary SCS1700.
 - c. Pecora Corporation; Pecora 898 NST (Non-Staining Technology):
www.pecora.com/#sle.
 - d. Sika Corporation; Sikasil GP: usa.sika.com/#sle.
 - e. Tremco Incorporated; Tremsil 200 Sanitary.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
 3. Applications:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between kitchen and bath countertops and wall surfaces.
- C. Type Wet Area Floor Sealant - Nonsag Traffic-Grade Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
 1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 20 to 30, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
 4. Products:
 - a. Substitutions: See Section 01 6000 - Product Requirements.
 5. Applications:
 - a. Interior control and expansion joints in concrete floors considered wet areas
- D. Type Acoustical Sealant - Acrylic-Urethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.
 1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
 2. Hardness Range: 15 to 40, Shore A, when tested in accordance with ASTM C661.
 3. Color: White.
 4. Products:
 - a. Acoustical Surfaces, Inc.; GREENchoice Acoustical Sound Sealant:
www.acousticalsurfaces.com
 - b. Hilti, Inc.: CP 506 Smoke and Acoustical Sealant.
 - c. Owens Corning: QuietZone.
 - d. Pecora Corporation; AIS-919 Acoustical and Insulation Latex Sealant.
 - 1) Substitutions: See Section 01 6000 - Product Requirements.

5. Applications:
 - a. In sound-rated wall assemblies, and where not indicated as fire-rated:
 - 1) Gaps between top stud runner and structure, between bottom stud track and
 - 2) Gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
- E. Type General Purpose Interior Sealant - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, nonstaining, nonbleeding, nonsagging; not intended for exterior use.
 1. Color: To be selected by Architect from manufacturer's full range.
 2. Products:
 - a. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle.
 - b. Sherwin-Williams Company; White Lightning 3006 Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - c. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - d. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - e. Tremco Commercial Sealants & Waterproofing; Tremflex 834: www.tremcosealants.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
 3. Applications:
 - a. Interior wall and ceiling control joints in non-wet areas.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Other interior joints for which no other type of sealant is indicated.
- F. Type Moving Joint Sealant - Noncuring Butyl Sealant: Solvent-based, single component, nonsag, nonskinning, nonhardening, nonbleeding; nonvapor permeable; intended for fully concealed applications.
 1. Products:
 - a. Pecora Corporation; Pecora BA-98 Non-Skinning Butyl Sealant: www.pecora.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 2. Applications:
 - a. Lap Joints in Sheet Metal Fabrications
 - b. Lap Joints between Manufactured Metal Panels

2.05 SELF-LEVELING JOINT SEALANTS

- A. Type Exterior Pavement Sealant - Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
 1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
 3. Color: Gray.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Products:
 - a. Pecora Corporation; ____: www.pecora.com/#sle.
 - b. Sherwin-Williams Company; Loxon SL1 Self-Leveling Sealant: www.sherwin-williams.com/#sle.
 - c. Sherwin-Williams Company; Loxon SL2 Multi-Component Self-Leveling Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - d. Sika Corporation; Sikaflex-1c SL: usa.sika.com/#sle.

- e. Sika Corporation; Sikaflex-2c SL: usa.sika.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- 6. Applications:
 - a. Control and Expansion Joints in Concrete Paving
- B. Type Interior Slabs (unpolished) - Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
 - 1. Composition: Multicomponent, 100 percent solids by weight.
 - 2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
 - 3. Color: To be selected by Architect from manufacturer's standard colors.
 - 4. Joint Width, Minimum: 1/8 inch.
 - 5. Joint Width, Maximum: 1/4 inch.
 - 6. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.
 - 7. Products:
 - a. Dayton Superior Corporation; SureFil J52 & Pro-Flex: www.daytonsuperior.com/#sle.
 - b. Euclid Chemical Company; EUCO 700: www.euclidchemical.com/#sle.
 - c. Metzger/McGuire; MM-80.
 - d. Nox-Crete Inc; DynaFlex 502: www.nox-crete.com
 - e. W.R. Meadows, Inc; Rezi-Weld Flex: www.wrmeadows.com
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- C. Type Interior Slabs - Polished - Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
 - 1. Durometer Hardness, Type A: ___, minimum, after seven days when tested in accordance with ASTM D2240.
 - 2. Color: To be selected by Architect from manufacturer's standard colors.
 - 3. Joint Width, Minimum: 1/8 inch.
 - 4. Joint Width, Maximum: 1/2 inch.
 - 5. Joint Depth: Provide product suitable for joints from 1/8 inch to 1 inch in depth excluding space for backer rod.
 - 6. Products:
 - a. BASIS OF DESIGN: Metzger/McGuire; Spal-Pro RS 88: www.metzgermcguire.com..
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

- A. Sealant Backing Rod, Closed-Cell Type:
 - 1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.
 - 2. Size: 25 to 50 percent larger in diameter than joint width.
- B. Sealant Backing Rod, Bi-Cellular Type:
 - 1. Cylindrical flexible sealant backings complying with ASTM C1330 Type B.
 - 2. Size: 25 to 50 percent larger in diameter than joint width.
- C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

- D. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- E. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- F. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated, or recommended by manufacturer:
 - 1. Width/depth ratio of 2:1.
 - 2. Neck dimension no greater than 1/3 of the joint width.
 - 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

- C. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

3.05 POST-OCCUPANCY

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION 07 9200

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**SECTION 07 9513
EXPANSION JOINT COVER ASSEMBLIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Expansion joint cover assemblies for floor, wall, ceiling, soffit, and roof surfaces.

1.02 RELATED REQUIREMENTS**1.03 REFERENCE STANDARDS****1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Installation Templates: For frames and anchors to be embedded in concrete or masonry, furnish templates to relevant installers; include installation instructions and tolerances.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices and available colors and finish.
- C. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, affected adjacent construction, anchorage locations, and ____.
- D. Samples: Submit two samples ____ inch long, illustrating profile, dimension, color, and finish selected.
- E. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 for additional provisions.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Expansion Joint Cover Assemblies:
 - 1. Balco, Inc: www.balcousa.com/#sle.
 - 2. Construction Specialties, Inc: www.c-sgroup.com/#sle.

2.02 EXPANSION JOINT COVER ASSEMBLY APPLICATIONS**2.03 EXPANSION JOINT COVER ASSEMBLIES**

- A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
 - 1. Joint Dimensions and Configurations: As indicated on drawings.
 - 2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
 - 3. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
 - 4. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.

2.04 MATERIALS**2.05 ACCESSORIES****PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.
- B. Verify that frames and anchors installed by others are in correct locations and suitable for installation of remainder of assembly.

3.02 INSTALLATION

- A. Install components and accessories in accordance with manufacturer's instructions.
- B. Align work plumb and level, flush with adjacent surfaces.
- C. Rigidly anchor to substrate to prevent misalignment.

3.03 PROTECTION

- A. Do not permit traffic over unprotected floor joint surfaces.
- B. Provide strippable coating to protect finish surface.

END OF SECTION 07 9513

**SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 9113 - Exterior Painting: Field painting.
- D. Section 09 9123 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

- A. ANSI: American National Standards Institute.
- B. ASCE: American Society of Civil Engineers.
- C. HMMA: Hollow Metal Manufacturers Association.
- D. NAAMM: National Association of Architectural Metal Manufacturers.
- E. NFPA: National Fire Protection Association.
- F. SCIF: Sensitive Compartmented Information Facility.
- G. SDI: Steel Door Institute.
- H. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2026.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- J. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- L. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- M. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.
- N. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
- O. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- P. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
 - 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 moldings, removable stops, and glazing.
 - 6. Details of conduit and preparations for power, signal, and control systems.
- D. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.
- E. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.
- F. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- G. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
- H. Manufacturer's Qualification Statement.
- I. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 - 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 3. Deansteel Manufacturing Company, Inc; Hollow Metal Doors - SP Series: www.deansteel.com/#sle.
 - 4. Fleming Door Products, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 5. Mesker, dormakaba Group; FDJ Series Drywall Frames: www.meskeropeningsgroup.com/#sle.
 - 6. Premier Steel Doors and Frames: www.trustpremier.com/#sle.
 - 7. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
 - 8. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 - 9. Titan Metal Products, Inc; Builders Series 20 - 90 Minute Doors: www.titanmetalproducts.com/#sle.
 - 10. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
 - 1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 - 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 - 4. Door Edge Profile: Manufacturers standard for application indicated.
 - 5. Typical Door Face Sheets: Flush.
 - 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
 - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - a. Based on SDI Standards: Provide at least A40/ZF120 (galvanized) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvanized) for corrosive locations.

- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Door Core Material: Polyisocyanurate, 2 lbs/cu ft minimum density.
 - a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
 3. Door Thermal Resistance: R-Value of 9.9, minimum, for installed thickness of polyisocyanurate.
 4. Door Thickness: 1-3/4 inches, nominal.
 5. Weatherstripping: Refer to Section 08 7100.
 6. Door Finish: Factory primed and field finished.
- B. Interior Doors, Non-Fire-Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 3. Door Thickness: 1-3/4 inches, nominal.
 4. Door Finish: Factory primed and field finished.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Exterior Door Frames: Face welded type.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvanized) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
 2. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
 3. Frame Finish: Factory primed and field finished.
 4. Weatherstripping: Separate, see Section 08 7100.
- C. Interior Door Frames, Non-Fire Rated: Face welded type.
1. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
 2. Frame Finish: Factory primed and field finished.

- D. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- E. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.
- F. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
- G. Transom Bars: Fixed, of profile same as jamb and head.
- H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.06 ACCESSORIES

- A. Door Window Frames: Door window frames with glazing securely fastened within door opening.
- B. Glazing: As specified in Section 08 8000, factory installed.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Astragals for Double Doors: Specified in Section 08 7100.
- E. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
- F. Mineral wool insulation to be packed inside all interior hollow metal frame during installation.
- G. Closed-cell spray-foam: Low-expansion, or minimally expanding, spray foam inside the frame cavity at all exterior doors.
- H. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- I. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Install door hardware as specified in Section 08 7100.

1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- D. Comply with glazing installation requirements of Section 08 8000.
- E. Coordinate installation of electrical connections to electrical hardware items.
- F. Interior Frames: Solidly pack miner-fiber insulation into frames.
- G. Exterior Frames: Fill frames with closed-cell spray-foam insulation.
- H. Touch up damaged factory finishes.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.

3.06 SCHEDULE - SEE DRAWINGS

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 1113

**SECTION 08 1416
FLUSH WOOD DOORS**

PART 1 GENERAL**1.01 SECTION INCLUDES****1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- C. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
- D. Samples: Submit two samples of door veneer, 2 by 2 inches in size illustrating wood grain, stain color, and sheen.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- F. Manufacturer's Installation Instructions: Indicate special installation instructions.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Specimen warranty.
- J. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- C. Woodwork Quality Assurance Program:
 - 1. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 2. Provide designated labels on shop drawings as required by quality assurance program.
 - 3. Provide designated labels on installed products as required by quality assurance program.

4. Submit documentation upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
 1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 1. Oregon Door: www.oregondoor.com/#sle.
 2. VT Industries, Inc; Heritage Collection: www.vtindustries.com/#sle.
 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL) Faced Doors:
 1. Forte Opening Solutions; Aspiro Choice Laminate Doors: www.forteopenings.com/#sle.
 2. Oregon Door: www.oregondoor.com/#sle.
 3. Poncraft Door Co: www.poncraft.com/#sle.
 4. VT Industries, Inc: www.vtindustries.com/#sle.
 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND PANELS

- A. Doors: See drawings for locations and additional requirements.
 1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS), AWMAC/WI (NAAWS) or WDMA I.S. 1A.
 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
 3. High Pressure Decorative Laminate (HPDL) Faced Doors: 5-ply unless otherwise indicated.
 4. Where plastic laminate (P'Lam) is indicated on door schedule, use either high pressure decorative laminate (HPDL) faced doors in compliance with AWI/AWMAC/WI (AWS), AWMAC/WI (NAAWS) or WDMA I.S. 1A, or low pressure decorative laminate (LPDL) faced doors in compliance with WDMA I.S. 1A.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 1. Provide solid core doors at each location.
 2. High pressure decorative laminate (HPDL) finish as indicated on drawings.

2.03 DOOR AND PANEL CORES

2.04 DOOR FACINGS

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.

- B. Cores Constructed with stiles and rails:
 - 1. Provide solid blocks at lock edge for hardware reinforcement.
 - 2. Provide solid blocking for other throughbolted hardware.
- C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
- B. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
 - 1. Transparent:
 - a. System - TR-8, UV Cured Acrylated Polyester/Urethane.
 - b. Stain: As selected by Architect.
 - c. Sheen: Satin.

2.07 ACCESSORIES

- A. Door Hardware: See Section 08 7100.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION 08 1416

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SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
- B. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.
- B. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- C. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2026.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- F. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2026.
- G. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- H. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
 - 1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
- D. Samples: Submit two samples two inches in size illustrating finished aluminum surface, glass, infill panels, glazing materials.

- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents. Coordinate all door hardware for aluminum entrances with door hardware supplier.
- H. Designer's qualification statement.
- I. Manufacturer's qualification statement.
- J. Installer's qualification statement.
- K. Specimen warranty.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of professional structural engineer experienced in design of this work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Locate where directed. Coordinate with Architect for Mock-Up location.
- C. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Aluminum-Framed Storefronts:
 - 1. Basis of Design: Tubelite USA: www.tubeliteusa.com/#sle.

- a. Exterior: Tubelite T/TU14000 : System selection dependent on System U Value requirement
- b. Interior: Tubelite E14000
2. Kawneer North America: www.kawneer.com/#sle.
3. Manko Window Systems, Inc: www.mankowindows.com/#sle.
4. Oldcastle BuildingEnvelope: www.oldcastlebe.com/#sle.
5. YKK AP America, Inc: www.ykkap.com/commercial/#sle.
6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 1. Glazing Position: Centered (front to back).
 2. Finish: Class I natural anodized.
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 3. Finish Color: _____.
 4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 7. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 8. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 10. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel, and heel bead of glazing compound.
- B. Performance Requirements
 1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
 2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 12 psf.
 - a. Static: No uncontrolled water entry at a 12 psf static pressure differential with water applied at a minimum rate of 5 gal/ft² hr when tested per ASTM E 331.
 - b. Dynamic: No uncontrolled water entry at 12 psf dynamic pressure with water applied at a minimum rate of 5 gal/ft²hr when tested per AAMA 501.1.

3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
4. Condensation Resistance Factor of Framing: 69 for dual thermal barrier storefront, minimum, measured in accordance with AAMA 1503.
5. Overall U-value Including Glazing, NFRC 100 System U Value for storefront (and curtainwall) systems:
 - a. Shall not exceed .34 BTU/hr-ft²- degreeF for Climate Zone 6
 - b. Shall not exceed .29 BTU/hr-ft²- degreeF for Climate Zone 7

2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Framing members for interior applications need not be thermally broken.
 2. Glazing Stops: Flush.
 3. Cross-Section: 2 by 4 1/2 inch nominal dimension.
 4. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member as required by manufacturer's delegated design.
- B. Glazing: See Section 08 8000.
- C. Swing Doors: Glazed aluminum.
 1. Basis of Design: Tubelite Therml=Block Doors at Exterior : Standard Doors at Interior
 2. Thickness: 1-3/4 inches.
 - a. Top Rail: 5 inches wide.
 - b. Vertical Stiles: 5 inches wide.
 - c. Bottom Rail: 10 inches wide.
 - d. Glazing Stops: Square.
 - e. Finish: Same as storefront.
 - f. NFRC 100 System U Value at Exterior Doors: Shall not exceed .63 BTU/hr-ft²- degree F

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.
- C. Exposed Flashings: Aluminum sheet, 18 gauge, 0.040" inch minimum thickness; finish to match framing members. This includes aluminum pan flashing with end dams at storefront sills.
- D. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.
- E. Sealant for Setting Thresholds: Non-curing butyl type.
- F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- G. Glazing Accessories: See Section 08 8000.

2.05 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

2.06 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold and continuous hinge.
- B. Other Door Hardware: See Section 08 7100.
- C. Weatherstripping: Continuous and replaceable; provide on all exterior doors.

- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all exterior doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all exterior doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack mineral wool insulation in shim spaces at perimeter of interior assemblies to maintain acoustical continuity and low expansion closed-cell spray-foam in shim spaces at perimeter of exterior assemblies to maintain continuity of thermal barrier.
- I. Set thresholds in bed of sealant and secure.
- J. Install hardware using templates provided.
 - 1. See Section 08 7100 for hardware installation requirements.
- K. Install glass and infill panels using glazing method required to achieve performance criteria; see Section 08 8000.
- L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

3.06 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 4313

DOOR HARDWARE

PART 1 - GENERAL

1.1 CONDITIONS

- A. Conditions of the contract (General and Supplementary Conditions) and Division 01 - General Requirements, govern the work of this section.
- B. This section includes all material, and related service necessary to furnish all finish hardware indicated on the drawings or specified herein.
- C. Furnish UL listed hardware for all labeled and 20 min. openings in conformance with the requirements for the class of opening scheduled. Underwriters' requirements shall have precedence over specification where conflicts exist.
- D. All work shall be in accordance with all applicable state and local building codes. Code requirements shall have precedence over this specification where conflicts exist.

1.2 WORK INCLUDED

- A. This section includes the following:
 - 1. Furnish door hardware (for hollow metal, wood and aluminum doors) specified herein, listed in the hardware schedule, and/or required by the drawings.
 - 2. Cylinders for Aluminum Doors
 - 3. Thresholds and Weather-stripping (Aluminum frame seals to be provided by aluminum door supplier)
 - 4. Electro-Mechanical Devices
 - 5. Access Control components and or systems specified within this section.
- B. Where items of hardware are not definitely or correctly specified and is required for the intended service, such omission, error or other discrepancy should be directed to the Architect prior to the bid date for clarification by addendum. Otherwise furnish such items in the type and quantity established by this specification for the appropriate service intended.

1.3 RELATED WORK IN OTHER SECTIONS

- A. This section includes coordination with related work in the following sections:
 - 1. Division 06 Section "Finish Carpentry".
 - 2. Division 06 Section "Cabinet Hardware"
 - 3. Division 08 Section "Hollow Metal Doors and Frames".
 - 4. Division 08 Section "Wood Doors"
 - 5. Division 08 Section "Aluminum Entrances and Storefronts"
 - 6. Division 26 Sections "Electrical"
 - 7. Division 28 Sections "Electronic Safety and Security".

1.4 REFERENCES

- A. Publications of agencies and organizations listed below form a part of this specification section to the extent referenced.
 - 1. DHI – Installation Guide for Doors and Hardware (2020).
 - 2. NFPA 80 - Standards for Fire Doors and Windows.
 - 3. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
 - 4. UL - Building Material Directory.
 - 5. DHI - Door and Hardware Institute
 - 6. WHI - Warnock Hersey
 - 7. BHMA - Builders Hardware Manufacturers Association
 - 8. ANSI – American National Standards Institute
 - 9. IBC - International Building Code 2021 Edition (as adopted and amended by local building code)

1.5 SUBMITTALS

- A. Within ten days after award of contract, submit detailed hardware schedule in quantities as required by Division 01 - General Requirements.

- B. Schedule format shall be consistent with recommendations for a vertical format as set forth in the Door & Hardware Institute's (DHI) publication "Sequence and Format for the Hardware Schedule". Hardware sets shall be consolidated to group multiple door openings which share similar hardware requirements. Schedule shall include the following information:
1. Door number, location, size, handing, and rating.
 2. Door and frame material, handing.
 3. Degree of swing.
 4. Manufacturer
 5. Product name and catalog number
 6. Function, type and style
 7. Size and finish of each item
 8. Mounting heights
 9. Explanation of abbreviations, symbols, etc.
 10. Numerical door index, indicating the hardware set/ group number for each door.
- C. The schedule will be prepared under the direct supervision of a certified Architectural Hardware Consultant (AHC), or certified Door Hardware Consultant (DHC) employed by the hardware distributor. The hardware schedule shall be signed and embossed or stamped with the DHI certification seal of the supervising AHC or DHC. The supervising AHC or DHC shall attend any meetings related to the project when requested by the architect.
- D. Check the specified hardware for suitability and adaptability to the details and surrounding conditions.
- E. Review drawings from related trades as required to verify compatibility with specified hardware. Indicate unsuitable or in compatible items, and proposed substitutions in the hardware schedule.
- F. Provide documentation for all hardware to be furnished on labeled fire doors indicating compliance with positive pressure fire testing UL 10C.
- G. Furnish manufacturers' catalog data for each item of hardware in quantities as required by Division 01 - General Requirements.
- H. Submit a sample of each type of hardware requested by the architect. Samples shall be of the same finish, style, and function as specified herein. Tag each sample with its permanent location so that it may be used in the final work.
- I. Furnish with first submittal, a list of required lead times for all hardware items.
- J. After final approved schedule is returned, transmit corrected copies for distribution and field use in quantities as required by Division 01 - General Requirements.
- K. Furnish approved hardware schedules, template lists, and pertinent templates as requested by related trades.
- L. Furnish necessary diagrams, schematics, voltage and amperage requirements for all electro-mechanical devices or systems as required by related trades. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.
- M. After receipt of approved hardware schedule, Hardware supplier shall initiate a meeting including the owner's representative to determine keying requirements. Upon completion of initial key meeting, hardware supplier shall prepare a proposed key schedule with symbols and abbreviations as set forth in the door and hardware institute's publication "Keying Procedures, Systems, and Nomenclature". Submit copies of owner approved key schedule for review and field use in quantities as required by Division 01 - General Requirements. Wiring diagrams shall be included in final submittals transmitted for distribution of field use.

1.6 QUALITY ASSURANCE

- A. Manufacturers and model numbers listed are to establish a standard of function and quality. Similar items by approved manufacturers that are equal in design, function, and quality, may be considered for prior approval of the architect, provided the required data and physical samples are submitted for approval as set forth in Division 01 - General Requirements.
- B. Where indicated in this specification, products shall be independently certified by ANSI for compliance with relevant ANSI/BHMA standards A156.1 - A156.36 – Standards for Hardware and Specialties. All

products shall meet or exceed certification requirements for the respective grade indicated within this specification. Supplier shall provide evidence of certification when requested by the architect.

- C. Obtain each type of hardware (hinges, latch & locksets, exit devices, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.
- D. Electrical drawings and electrical specifications are based on the specific electrified hardware components specified in hardware sets. When electronic hardware components other than those indicated in hardware sets are provided, the supplier shall be responsible for all costs incurred by the design team and their consultants to review and revise electrical drawings and electrical specifications. Supplier shall also be responsible for any additional costs associated with required changes in related equipment, materials, installation, or final hook up to ensure the system will operate and function as indicated in the construction documents, including hardware set operational / functional descriptions.
- E. All hardware items shall be manufactured no earlier than 6 months prior to delivery to site.
- F. Installation of hardware shall be installed or directly supervised and inspected by a skilled installer certified by the manufacturer of locksets, door closers, and exit devices used on the project, or with not less than 3 years' experience in successful completion of projects similar in size and scope.
- G. Provide hardware for all labeled fire doors, which complies with positive pressure fire testing UL 10C.
- H. Comply with all applicable provisions of the standards referenced within section 1.4 of this specification.
- I. Hardware supplier shall participate when reasonably requested to meet with the contractor and or architect to inspect any claim for incorrect or non-functioning materials; following such inspection, the hardware supplier shall provide a written statement documenting the cause and proposed remedy of any unresolved items.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Hardware supplier shall deliver hardware to the job site unless otherwise specified.
- B. All hardware shall be delivered in manufacturers' original cartons and shall be clearly marked with set and door number.
- C. Coordinate with contractor prior to hardware delivery and recommend secure storage and protection against loss and damage at job site.
- D. Contractor shall receive all hardware and provide secure and proper protection of all hardware items to avoid delays caused by lost or damaged hardware. Contractor shall report shortages to the Architect and hardware supplier immediately after receipt of material at the job site.
- E. Coordinate with related trades under the direction of the contractor for delivery of hardware items necessary for factory installation.

1.8 PRE-INSTALLATION MEETING

- A. Schedule a hardware pre-installation meeting on site to review and discuss required door operating clearances and the installation of continuous hinges, locksets, door closers, exit devices, overhead stops, and electromechanical door hardware.
- B. Meeting attendees shall be notified 7 days in advance and shall include: Architect, Contractor, Door Hardware Installers (including low voltage hardware), Manufacturers representatives for above hardware items, and any other effected subcontractors or suppliers.
- C. All attendees shall be prepared to distribute installation manuals, hardware schedules, templates, and physical hardware samples.

1.9 WARRANTY

- A. All hardware items shall be warranted against defects in material and workmanship as set forth in Division 01 - General Requirements.
- B. Repair, replace, or otherwise correct deficient materials and workmanship without additional cost to owner.

PART 2 - PRODUCTS

2.1 FASTENERS

- A. All exposed fasteners shall be Phillips head or as otherwise specified and shall match the finish of the adjacent hardware. All fasteners exposed to the weather shall be non-ferrous or stainless steel. Furnish correct fasteners to accommodate surrounding conditions.
- B. Coordinate required reinforcements for doors and frames. Seek approval of the architect prior to furnishing through-bolts. Furnish through-bolts as required for materials not readily reinforced.

2.2 BUTT HINGES

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Ives</u>	<u>Stanley</u>	<u>Hager</u>	<u>McKinney</u>
1. Standard Weight, Plain Bearing	5PB1	F179	****	T2714
2. Standard Weight, Ball Bearing	5BB1	BB179	BB1279	TB2714
3. Standard Weight, Ball Bearing, Non-Ferrous	5BB1	FBB191	BB1191	TB2314
4. Heavy Weight, Ball Bearing	5BB1HW	FBB168	BB1168	T4B3786
5. Heavy Weight, Ball Bearing, Non-Ferrous	5BB1HW	FBB199	BB1199	T4B3386

- B. Hinges shall be independently certified by ANSI for compliance with ANSI A156.1 (2006). Hinges shall meet or exceed the following ANSI grade requirements as indicated below:

- 1. Standard Weight, Plain Bearing Hinges: Grade 3
- 2. Standard Weight, 2 Ball Bearing Hinges: Grade 2
- 3. Heavy Weight, 4 Ball Bearing Hinges: Grade 1

- C. Unless otherwise specified, furnish the following hinge quantities for each door leaf.

- 1. 3 hinges for doors up to 90 inches.
- 2. 1 additional hinge for every 30 inches on doors over 90 inches.
- 3. 4 hinges for Dutch door applications.

- D. Unless otherwise specified, top and bottom hinges shall be located as specified in Division 08 Section "Hollow Metal Doors and Frames". Intermediate hinges shall be located equidistant from others.

- E. Unless otherwise specified, furnish hinge weight and type as follows:

- 1. Standard weight: plain bearing hinge 5PB1 or ball bearing hinge 5BB1 for interior openings through 36 inches wide without a door closer.
- 2. Standard weight: ball bearing hinge 5BB1 for interior opening over 36 through 40 inches wide without a door closer, and for interior openings through 40 inches wide with a door closer.
- 3. Heavyweight: 4 ball bearing hinge 5BB1HW for interior openings over 40 inches wide, and for all vestibule doors.
- 4. Heavyweight: 4 ball bearing hinge 5BB1HWss for exterior openings unless otherwise listed in groups.
- 5. Heavyweight: 4 ball bearing hinge 5BB1HWss 5" for all exterior doors or 4 ball bearing hinge 5BB1HW 5" for interior doors, that have an automatic operator.

- F. At existing frames receiving new hinges, match existing hinge size and weight.

- G. Unless otherwise specified, furnish brass, bronze, or stainless-steel base metal for hinges at exterior doors. Unless otherwise specified, furnish steel base metal for hinges at interior and labeled doors.

- H. Furnish stainless steel base metal for hinges at showers, pools, and wash bay doors.

- I. Unless otherwise specified, furnish hinges in the following sizes:

- 1. 5" x 5" 2-1/4" thick doors
- 2. 4-1/2" x 4-1/2" 1-3/4" thick doors
- 3. 3-1/2" x 3-1/2" 1-3/8" thick doors

- J. Furnish hinges with width to accommodate trim and allow for 180-degree swing.

- K. Unless otherwise specified, furnish hinges with flat button tips with non-rising pins at interior doors, non-removable loose pins (NRP) at exterior, and out-swinging lockable interior doors.

- L. Unless otherwise specified, furnish all hinges to template standards.

2.3 CONTINUOUS PIN AND BARREL HINGES

- A. Acceptable manufacturers and respective catalog numbers:

<u>Ives</u>	<u>Markar</u>	<u>Stanley</u>
-------------	---------------	----------------

- | | | | |
|---|------------|------------|------------|
| 1. Edge Mount Pin & Barrel Stainless Steel Continuous Hinge | 700 Series | 300 Series | 650 Series |
|---|------------|------------|------------|
- B. Hinges shall be independently certified by ANSI for compliance with ANSI A156.26, Grade 1 (2012).
- C. Continuous hinges shall be full height pin and barrel type hinge providing full height door support up to 600 lbs. Edge mount (unless noted otherwise).
- D. Construct hinges of heavy-duty 14-gauge material. The stainless internal pin shall have a diameter of 0.25 and the exterior barrel diameter of 0.438.
- E. Hinge shall be non-handed with symmetrical template hole pattern and factory drilled. Hinge must accept a minimum of 21 fasteners on the door and 21 fasteners on the frame.
- F. Each knuckle to be 2 inches, including split nylon bearing at each separation for quiet, smooth, self-lubricating operation.
- G. Hinge to be able to carry Warnock Hersey Int. or UL for fire rated doors and frames up to 3 hours.
- H. Provide machine screws for doors which have been reinforced to accept machine screws.
- I. Note: Fire label for doors and frames should be placed on the header and top rail of fire rated doors and frames.

2.4 POWER TRANSFERS

- A. Acceptable manufacturers and respective catalog numbers:
- | | | |
|-----------------------|-------------------|-------------|
| | <u>Von Duprin</u> | <u>ASSA</u> |
| 1. Concealed Two Wire | EPT-2 | CEPT-10 |
| 2. Concealed Ten Wire | EPT-10 | CEPT-10 |
- B. Concealed power transfers shall be concealed in the door and frame when the door is closed.
- C. Concealed power transfers shall have a steel tube to protect wires from being cut.
- D. Concealed power transfers with spring tubes shall be rejected.
- E. Concealed power transfers shall be supplied with a mud box to house all terminations.

2.5 FLUSH BOLTS AND DUST PROOF STRIKES

- A. Acceptable manufacturers and respective catalog numbers:
- | | | | |
|--|-------------|---------------|--------------|
| | <u>Ives</u> | <u>Trimco</u> | <u>Hager</u> |
| 1. Dust Proof Strike | DP2 | 3910 | 280X |
| 2. Constant Latching Bolt (Metal Door) | FB51P | 3820 | 293D |
| 3. Constant Latching Bolt (Wood Door) | FB61P | 3825L | 294D |
- B. Unless otherwise specified, provide 12" rods for manual flush bolts for door 7'6" or less, 24" top rods for doors over 7'6" to 8'6".
- C. Unless otherwise specified, provide doors over 8'6" with automatic top bolts.
- D. Provide automatic flush bolts where required to maintain fire door listing and or egress requirements on pairs of doors.
- E. All flush-bolt applications shall be UL listed to be installed with top flush-bolt only. Provide auxiliary fire bolt as required for fire rated openings where less bottom bolt has been specified.
- F. Provide all bottom flush bolts with non-locking dust proof strikes.

2.6 EXIT DEVICES

- A. Acceptable manufacturers and respective catalog numbers:
- | | | | |
|--|-------------------|--------------------|---------------------------|
| | <u>Von Duprin</u> | <u>Falcon</u> | <u>Detex</u> |
| 1. Wide Stile, Push Pad | 78 Series | 25 Series | Advantex (Wide Stile) |
| 2. Wide Stile, Electric Latch Retraction | QEL 78 Series | MEL 25 Series | Advante-ER x (Wide Stile) |
| 3. Lever Trim | 780L Series | 510L / 511L Series | "D/DM" Trim |
| 4. Pull Trim | 785 Series | 512 Series | "C" Trim |
- A. Exit devices shall be independently certified by ANSI for compliance with ANSI A156.3, Grade 1 (2008).

- B. Obtain exit devices from a single manufacturer, although several may be indicated as offering products complying with requirements.
- C. All exit devices shall be equipped with a sound-dampening feature to reduce touch pad return noise.
- D. Quiet Electric Latch Retraction shall be accomplished using a motor driven assembly, and shall incorporate the following features:
 - 1. Motor shall retract both the push pad assembly and latchbolt.
 - 2. Automatic calibration of latch throw and pull.
 - 3. Built-in time delay.
 - 4. On-board installation and troubleshooting diagnostics built into power supply and device.
 - 5. Retry mode if device does not pull on the first try.
- E. On full glass doors there shall be no exposed fasteners on the back of the mechanism visible through the glass.
- F. All exit devices shall be provided with flush end caps to reduce potential damage from impact.
- G. All exit devices shall be provided with dead-locking latch bolts to ensure security.
- H. All exit devices shall be U.L. listed for accident hazard. Exit device for use on fire doors shall also be U.L. listed for fire exit hardware.
- I. Provide optional strikes, special length rods, and adapter plates to accommodate door and frame conditions. Provide narrow style series devices in lieu of wide stile series devices where optional strikes will not accommodate door and frame conditions.
- J. Coordinate with related trades to ensure adequate clearance and reinforcement is provided in doors and frames. Provide thru bolts as required.
- K. Refer to hardware groups for exit device applications utilizing the option of: "less bottom rod and floor strike" (LBR)
- L. All exit devices shall be provided with optional trim designs to match other lever and pull designs used on the project.
- M. Unless specific exit device dogging options are noted within hardware sets, provide dogging options as follows:
 - 1. Fire Rated devices: Dogging not permitted.
 - 2. Non-Rated Exit Only functions not equipped with outside trim or pull: Less Dogging.
 - 3. Non-Rated Classroom functions: Less Dogging.
 - 4. Non-Rated devices utilizing electric latch retraction or electrified outside trim: Less Dogging.
 - 5. All Other Non-Rated devices: Cylinder Dogging utilizing interchangeable core cylinders. Cylinder keyway shall match locksets furnished on this project.
- N. Provide glass bead kits as required to accommodate door conditions. Screws shall not be visible through full glass doors.
- O. Where specified, provide compatible keyed mullions with cylinder for pairs of doors.

2.7 LOCKS AND LATCHES

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Schlage</u>	<u>Corbin</u>
1. Grade 1 Mortise	PM Series RHO	ML2000 NSA
2. Grade 1 Cylindrical	PC Series RHO	CLX3300 NZD
- B. Bored locks shall be independently certified by ANSI for compliance with ANSI A156.2 (2011). Mortise locks shall be independently certified by ANSI for compliance with ANSI A156.13 (2012).
- C. Unless otherwise specified, all locks and latches to have:
 - 1. 2-3/4" Backset
 - 2. 1/2" minimum throw latchbolt
 - 3. 1" throw deadbolt
 - 4. ANSI A115.2 strikes
- D. Provide guarded latch bolts for all locksets, and latch bolts with throw to maintain fire rating of both single and paired door assemblies.

- E. Provide strike with lip length adequate to clear surrounding trim.
- F. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.
- G. Provide Von Duprin #154 or equivalent mullion/frame stabilizers at the following application(s) unless provided with deadbolt:
 - 1. Lockable exterior or vestibule paired openings with a fixed or removable hollow metal or aluminum mullion.
 - 2. Lockable exterior or vestibule single doors in aluminum frames.

2.8 PULLS, PUSH BARS, PUSH/PULL PLATES

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Ives</u>	<u>Burns</u>	<u>Trimco</u>
1. Offset Door Pull (1" dia., 10" CTC)	8190-0	39C	1191-3
2. Offset Pull / Push-Bar (1" dia., 10" CTC Pull)	9190-0	422 x 39C	1737
3. Push Plate (.050 6" X 16")	8200 6" X 16"	56	1001-9
4. Pull Plate (1" dia., 10" CTC - .050" X 4" X 16")	8303-0 4" X 16"	5426C	1018-3B

- A. Adjust dimensions of push plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, push plates shall be factory drilled for cylinders or other mortised hardware. All push plates shall be beveled 4 sides and counter sunk.
- B. Where required on wide stile doors, install straight pull offset of cylinder to allow for access to cylinder.
- C. Where possible, provide back-to-back, and concealed mounting for pulls and push bars. Push bar length shall be 3" less door width, or center of stile to center of stile for stile & rail or full glass doors.

2.9 CLOSERS

- A. Acceptable manufacturers and respective catalog numbers:

<u>LCN</u>	<u>Norton</u>
1. 4050A / 4050A EDA	R7500 / PR7500
2. 1450A / 1450A EDA FC	8501 FC

- B. Door closers shall be independently certified by ANSI for compliance with ANSI A156.4, Grade 1 (2013).
- C. Obtain door closers from a single manufacturer, although several may be indicated as offering products complying with requirements.
- D. Provide extra heavy-duty arm (EDA / HD) when closer is to be installed using parallel arm mounting.
- E. Hardware supplier shall coordinate with related trades to ensure aluminum frame profiles will accommodate specified door closers.
- F. Closers shall use aluminum cylinders.
- G. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UL10C.
- H. Unless otherwise specified, all door closers shall have full covers and separate adjusting valves for sweeps, latch, and backcheck.
- I. Provide closers for all labeled doors. Provide closer series and type consistent with other closers for similar doors specified elsewhere on the project.
- J. Provide closers with adjustable spring power. Size closers to ensure exterior and fire rated doors will consistently close and latch doors under existing conditions. Size all other door closers to allow for reduced opening force not to exceed 5 lbs.
- K. Install closers on the room side of corridor doors, stair side of stairways and interior side of exterior doors.
- L. Closers shall be furnished complete with all mounting brackets and cover plates as required by door and frame conditions, and by adjacent hardware.

2.10 LOW ENERGY ELECTRO-MECHANICAL AUTOMATIC OPERATORS

- A. Acceptable manufacturers and respective catalog numbers:

	<u>LCN</u>	<u>Stanley</u>
1. Electro-Mechanical Operator	9500 Sr. Swing	MagicForce

- B. Low energy operators shall be independently certified by ANSI for compliance with ANSI A156.19 (2002).
- C. Where low kinetic energy, as defined by ANSI/BHMA Standard A156.19, power operators are indicated for doors required to be accessible to the disabled, provide electrically powered operators complying with the ADA for opening force and time to close standards.
- D. Operator operation shall consist of Push button, push plate, switch-activated, manual or manual/electric power assisted Push 'N' Go opening with power boost closing and holding as specified in hardware sets.
- E. Operators shall comply with ANSI A156.19, UL 325, and the American with Disabilities Act.
- F. In event of power failure, make door operate manually with controlled spring close as though equipped with a #3 manual door closer, without damage to operator components.
- G. Provide adjustment by microprocessor control for:
 - 1. Opening speed.
 - 2. Backcheck.
 - 3. Hold-open, from 5 to 30 seconds.
 - 4. Closing speed.
 - 5. Opening force.
 - 6. Acceleration during opening and recycling, for soft start.
 - 7. Door will safely stop and reverse if an object is encountered in the opening or closing cycle.
- H. Operator equipment shall be completely electromechanical and include the following features:
 - 1. Close and center door against stop after each cycle, and hold against drafts, winds and stack pressure.
 - 2. Manual opening force: 14 lb-force (62 N) maximum.
 - 3. Closing force: 6 lb-force (26.6 N).
 - 4. Factory-set door hold-open voltage.
 - 5. Control box and motor/gear box shall be contained in protective housing; utilize precision-machined gears and bearing seats, all-weather lubricant, and shall be mounted on vibration isolators.
 - 6. Gears shall be manufactured by operator manufacturer specifically for operators.
 - 7. Motor shall consist of a DC permanent magnet motor with shielded ball bearings. Motor shall stop when door stops or is fully open and when breakaway is operated.
 - 8. Door operating arm shall be fabricated from forged steel and attached at natural pivot point of door. Do not use slide block in top of door.
 - 9. Exposed arms shall be factory-polished and finished to match operator enclosure.
 - 10. Control circuits for actuators and safeties shall be low-voltage, NEC Class II.
 - 11. Power operators will require 115 VAC power supply.
- I. Enclosure shall consist of a extruded aluminum header concealing all operating parts except arms and manual control switches.
- J. Exterior switches shall be weather resistant and mount on a single gang electrical box furnished by Division 26.
- K. Power Operators shall be warranted by the manufacturer to be free from defects in material and workmanship for a period of two years.

2.11 KICK PLATES AND MOP PLATES

- A. Furnish protective plates as specified in hardware groups.
- B. Where specified, provide 10" kick plates, 34" armor plates, and 4" mop plates. Unless otherwise specified, metal protective plates shall be .050" thick; plastic plates shall be 1/8" thick.
- C. Protective plates shall be 2" less door width, or 1" less door width at pairs. All protective plates shall be beveled 4 sides and counter sunk.
- D. Protection plates over 16" shall not be provided for labeled doors unless specifically approved by door manufacturers listing. When protection plates over 16" are provided for labeled doors, the plate shall be labeled.

- E. Where specified, provide surface mounted door edges. Edges shall butt to protective plates. Provide edges with cutouts as required adjacent hardware.
- F. Adjust dimensions of protection plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware.

2.12 OVERHEAD STOPS

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Glynn-Johnson</u>	<u>Rixson</u>	<u>Sargent</u>
1. Heavy Duty Surface Mount	GJ900 Series	9 Series	590
2. Heavy Duty Concealed Mount	GJ100 Series	1 Series	690

- B. Unless otherwise specified, furnish GJ900 series overhead stop for hollow metal or 1-3/4" solid core doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall, for hollow metal or 1-3/4" solid core doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in hardware groups.
- C. Furnish sex bolt attachments for wood and mineral core doors unless doors are supplied with proper reinforcing blocks.
- D. Provide special stop only ("SE" suffix) overhead stops when used in conjunction with electronic hold open closers.
- E. Do not provide holder function for labeled doors.

2.13 WALL STOPS AND HOLDERS

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Ives</u>	<u>Trimco</u>	<u>Burns</u>
1. Wrought Concave Wall Stop	WS406CCV	1270CV	575
2. Automatic Wall Holder	WS40	1254	533

- B. Furnish a stop or holder for all doors.
- C. Provide concave style wall stop at all adjacent integral push button locks; provide convex style wall stop at all other locations.
- D. Where wall stops are not applicable, furnish overhead stops.
- E. Furnish floor stops or hinge pin stops only where specified in hardware sets.
- F. Do not provide holder function for labeled doors.

2.14 WEATHERSTRIP, GASKETING

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Zero</u>	<u>Pemko</u>	<u>NGP</u>	<u>Reese</u>
1. Weatherstrip	429	2891_PK	700NA	755
2. Adhesive Gasket	188	S88	5050	797
3. Sweep w/ drip	8198	345_N	C627	354
4. Drip Cap	142	346	16	R201

- B. Weatherstrip and gasketing shall be independently certified by ANSI for compliance with ANSI A156.22 (2005).
- C. Where specified in the hardware groups, furnish the above products unless otherwise detailed in groups.
- D. Provide weatherstripping all exterior doors and where specified.
- E. Provide intumescent and other required edge sealing systems as required by individual fire door listings to comply with positive pressure standards UL 10C.
- F. Provide Zero 188 smoke gaskets at all fire rated doors and smoke and draft control assemblies.
- G. Provide gasketing for all meeting edges on pairs of fire doors. Gasketing shall be compatible with astragal design provided by door supplier as required for specific fire door listings.

2.15 THRESHOLDS

- A. Acceptable manufacturers and respective catalog numbers:

	<u>Zero</u>	<u>Pemko</u>	<u>NGP</u>	<u>Reese</u>
1. Saddle Thresholds	8655	171	425	S205
2. Half Saddle Thresholds	1674	227	324	S239
3. Interlocking Threshold	74A	114	442-5	T550
4. ¼" Saddle Thresholds	63	151	411	S263
5. Threshold	653	169	****	****

- A. Thresholds shall be independently certified by ANSI for compliance with ANSI A156.21 (2001).
- B. Hardware supplier shall verify all finish floor conditions and coordinate proper threshold as required to ensure a smooth transition between threshold and interior floor finish.
- C. Threshold Types:
1. Unless otherwise specified, provide saddle threshold similar to Zero 8655 for all exterior openings with an interior floor finish less than or equal to 1/4" in height.
 2. Unless otherwise specified, provide half saddle threshold similar to Zero 1674 for all exterior openings with an interior floor finish greater than 1/4" in height. Threshold height shall match thickness of interior floor finish.

2.16 FINISHES AND BASE MATERIALS

- A. Unless otherwise indicated in the hardware groups or herein, hardware finishes shall be applied over base metals (steel-based at labeled doors) as specified in the following finish schedule:

<u>HARDWARE ITEM</u>	<u>BHMA FINISH AND BASE MATERIAL (AT INTERIOR DOORS)</u>
1. Butt Hinges: Exterior, or Non-Ferrous	630 (US32D - Satin Stainless Steel)
2. Butt Hinges: Interior or Ferrous	652 (US26D - Satin Chromium on Steel)
3. Continuous Hinges	630 (US32D - Satin Stainless Steel)
4. Flush Bolts	626 (US26D - Satin Chromium)
5. Exit Devices	626 (US26D - Satin Chromium)
6. Locks and Latches	626 (US26D - Satin Chromium)
7. Pulls and Push Plates/Bars	630 (US32D - Satin Stainless Steel)
8. Closers	689 (Aluminum)
9. Protective Plates	630 (US32D - Satin Stainless Steel)
10. Overhead Stops	630 (US32D - Satin Stainless Steel)
11. Wall Stops and Holders	630 (US32D - Satin Stainless Steel)
12. Thresholds	719 (Mill Aluminum)
13. Weather-strip, Sweeps Drip Caps	Aluminum Anodized
14. Weather-strip, Sweeps Drip Caps (aluminum doors)	Match finish of aluminum doors.
15. Miscellaneous	626 (US26D - Satin Chromium)

- B. Unless otherwise indicated in the hardware groups or herein, hardware finishes shall be applied over base metals (steel-based at labeled doors) as specified in the following finish schedule:

<u>HARDWARE ITEM</u>	<u>BHMA FINISH AND BASE MATERIAL (ALUMINUM AND EXTERIOR DOORS)</u>
1. Butt Hinges: Exterior, or Non-Ferrous	614 (US10A - Oxidized Bronze)
2. Butt Hinges: Interior or Ferrous	641 (US10A - Oxidized Bronze on Steel)
3. Continuous Hinges	710 (313AN - Dark Bronze Anodized)
4. Flush Bolts	643e (Aged Bronze)
5. Exit Devices	313AN (Anodized Duranodic)
6. Locks and Latches	643e (Dark Bronze)
7. Pulls and Push Plates/Bars	695 (Dark Bronze)
8. Closers	695 (Dark Bronze)
9. Protective Plates	695 (Dark Bronze)
10. Overhead Stops	SP313 (Powder coat dark bronze)
11. Wall Stops and Holders	643e (Aged Bronze)
12. Thresholds	719 (Mill Aluminum)
13. Weather-strip, Sweeps Drip Caps	Dark Bronze Anodized

- 14. Weather-strip, Sweeps Drip Caps (aluminum doors)
- 15. Miscellaneous

Match finish of aluminum doors.
613 (US10B - Oil Rubbed Bronze)

2.17 KEYING

- A. Acceptable manufacturers and respective catalog numbers:
 - Schlage Corbin
 - 1. Everest 29 Access
- B. Provide all locks and cylinders utilizing a patented keyway to prevent manufacturing and distribution of aftermarket key blanks by anyone other than factory authorized dealers.
- C. All locks under this section shall be keyed as directed by the owner to a new Patented Master Key System.
- D. Keying shall be by lock manufacturer where permanent records shall be kept.
- E. Furnish a total of 2 keys per cylinder. Actual cut keys to be determined by owner.
- F. Furnish a total of 10 construction keys. Furnish a total of 2 construction control keys.
- G. Furnish a minimum of 2 permanent control keys. Actual number to be determined by owner during keying meeting.
- H. Master keys, control keys to be delivered by registered mail to the owner. Change keys shall be delivered in a set up key cabinet. Construction keys shall be delivered to the contractor.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, installer shall examine door frame installation to ensure frames have been set square and plumb. Installer shall examine doors, door frames, and adjacent wall, floor, and ceiling for conditions, which would adversely affect proper operation and function of door assemblies. Do not proceed with hardware installation until such deficiencies have been corrected.

3.2 INSTALLATION

- A. Before hardware installation, general contractor/construction manager shall coordinate a hardware installation seminar with a 1 week notice to all parties involved. The seminar is to be conducted on the installation of hardware, specifically of locksets, closers, exit devices, continuous hinges and overhead stops. Manufacturer's representative of the above products to present seminar. Seminar to be held at the job site and attended by installers of hardware (including low voltage hardware) for aluminum, hollow metal and wood doors. Training to include use of installation manuals, hardware schedule, templates and physical products samples.
- B. Shim doors as required to maintain proper operating clearance between door and frame.
- C. Install all hardware in accordance with the approved hardware schedule and manufacturer's instructions for installation and adjustment.
- D. Set units level, plumb and true to the line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Provide blocking or reinforcement for all hardware mounted to drywall construction, including wall mounted door stops and holders.
- F. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accord with industry standards.
- G. Drill appropriate size pilot holes for all hardware attached to wood doors and frames.
- H. Unless otherwise specified, locate all hardware in accordance with the recommended locations for builders hardware for standard doors and frames as published by the Door and Hardware Institute (TDH-007-20).
- I. Use only fasteners supplied by or approved by the manufacturer for each respective item of hardware.
- J. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.
- K. Conceal push and pull bar fasteners where possible. Do not install through bolts through push plates.
- L. Install hardware on UL labeled openings in accordance with manufacturer's requirements to maintain the label.

- M. Apply self-adhesive gasketing on frame stop at head & latch side and on rabbet of frame at hinge side.
- N. Install hardware in accordance with supplemental "S" label instructions on all fire rated openings.
- O. Install wall stops to contact lever handles or pulls. Do not mount wall stops on casework, or equipment.
- P. Where necessary, adjust doors and hardware as required to eliminate binding between strike and latchbolt. Doors should not rattle.
- Q. Overhead stops used in conjunction with electrified hold open closers shall be templated and installed to coincide with engagement of closer hold open position.
- R. Install door closers on corridor side of lobby doors, room side of corridor doors, and stair side of stairways.
- S. Adjust spring power of door closers to the minimum force required to ensure exterior and fire rated doors will consistently close and latch doors under existing conditions. Adjust all other door closers to ensure opening force does not to exceed 5 lbs.
- T. Adjust "sweep", "latch", & "back check" valves on all door closers to properly control door throughout the opening and closing cycle. Adjust total closing speed as required to comply with all applicable state and local building codes.
- U. Install "hardware compatible" (bar stock) type weatherstripping continuously for an uninterrupted seal. Adjust templating for parallel arm door closers, exit devices, etc., as required to accommodate weatherstripping.
- V. Unless otherwise specified or detailed, install thresholds with the bevel in vertical alignment with the outside door face. Notch and closely fit thresholds to frame profile. Set thresholds in full bed of sealant.
- W. Compress sweep during installation as recommended by sweep manufacturer to facilitate a water-resistant seal.
- X. Deliver to the owner 1 complete set of installation and adjustment instructions, and tools as furnished with the hardware.

3.3 FIELD QUALITY CONTROL

- A. After installation has been completed, the hardware supplier for locksets, door closers, exit devices, and overhead stops shall check the project and verify compliance with installation instructions, adjustment of all hardware items, and proper application according to the approved hardware schedule. Hardware representative shall submit a list of all hardware that has not been installed correctly.
- B. After installation has been completed, the hardware supplier shall meet with the owner to explain the functions, uses, adjustment, and maintenance of each item of hardware. Hardware supplier shall provide the owner with a copy of all wiring diagrams. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.

3.4 ADJUSTMENT AND CLEANING

- A. At final completion, and when H.V.A.C. equipment is in operation, installer shall make final adjustments to and verify proper operation of all door closers and other items of hardware. Lubricate moving parts with type lubrication recommended by the manufacturer.
- B. All hardware shall be left clean and in good operation. Hardware found to be disfigured, defective, or inoperative shall be repaired or replaced.

3.5 HARDWARE SCHEDULE

- A. The following schedule of hardware groups are intended to describe opening function. The hardware supplier is cautioned to refer to the preamble of this specification for a complete description of all materials and services to be furnished under this section.

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HW SET 01

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	CLASSROOM LOCK	PC70	SCH
1	EA	WALL STOP	WS406/407CCV	IVE

FUNCTION: (F84) CLASSROOM LOCK. LATCH RETRACTED BY LEVER EITHER SIDE. OUTSIDE KEY LOCKS/UNLOCKS OUTSIDE LEVER. INSIDE LEVER ALWAYS UNLOCKED.

HW SET 02

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	CLASSROOM LOCK	PC70	SCH
1	EA	SURFACE CLOSER	1450 FC / 1450 EDA FC	LCN
1	EA	KICK PLATE	8400 10"	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
1	EA	GASKETING	188S (AT RATED OR SMOKE & DRAFT CONTROL DRS ONLY)	ZER

FUNCTION: (F84) CLASSROOM LOCK. LATCH RETRACTED BY LEVER EITHER SIDE. OUTSIDE KEY LOCKS/UNLOCKS OUTSIDE LEVER. INSIDE LEVER ALWAYS UNLOCKED.

HW SET 03

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	FLUSH BOLT	CONSTANT LATCHING (TOP BOLT ONLY)	IVE
1	EA	CLASSROOM LOCK	PC70	SCH
1	EA	OH STOP & HOLDER	90H	GLY
1	EA	WALL STOP/HOLDER	WS40	IVE

FUNCTION: (F84) CLASSROOM LOCK. LATCH RETRACTED BY LEVER EITHER SIDE. OUTSIDE KEY LOCKS/UNLOCKS OUTSIDE LEVER. INSIDE LEVER ALWAYS UNLOCKED.

HW SET 04

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	FLUSH BOLT	CONSTANT LATCHING	IVE
1	EA	STOREROOM	PC80	SCH
1	EA	OH STOP	90S	GLY
1	EA	SURFACE CLOSER	1450 SCUSH FC	LCN
2	EA	KICK PLATE	8400 10"	IVE

FUNCTION: (F86) STOREROOM LOCK. FIXED OUTSIDE TRIM - OUTSIDE KEY OR INSIDE LEVER RETRACTS LATCH. INSIDE LEVER ALWAYS UNLOCKED.

HW SET 05

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	BATH/BEDROOM PRIVACY LOCK W/ OUTSIDE INDICATOR	PM040 OS-OCC	SCH
1	EA	SURFACE CLOSER	1450 FC / 1450 EDA FC	LCN
1	EA	KICK PLATE	8400 10"	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
1	EA	PERIMETER SEAL	188S	ZER

FUNCTION: (F22) PRIVACY LOCK. OUTSIDE LEVER LOCKED BY INSIDE TURN. OUTSIDE LEVER UNLOCKED BY INSIDE TURN, INSIDE LEVER, OUTSIDE EMERGENCY KEY, OR CLOSING DOOR. INSIDE LEVER ALWAYS UNLOCKED. OUTSIDE INDICATOR DISPLAYS OCCUPIED/VACANT STATUS.

HW SET 06

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HARDWARE	BY DOOR SUPPLIER	B/O

HW SET 07

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	POWER TRANSFER	EPT2/EPT10	VON
1	EA	ELEC PANIC HARDWARE	QEL-78-NL	VON
1	EA	IC CYLINDER	AS REQUIRED	
1	EA	SURFACE CLOSER	4050A SCUSH	LCN
1	EA	ARMOR PLATE	8400 34"	IVE
1	EA	RAIN DRIP	142	ZER
1	SET	GASKETING	429 (MOUNT PRIOR TO CLOSER)	ZER
1	EA	DOOR SWEEP	8198 W/DRIP	ZER
1	EA	THRESHOLD	AS REQUIRED	ZER
1	EA	CREDENTIAL READER	BY OWNER VENDER	B/O
1	EA	POWER SUPPLY	CENTRALIZED	
1	EA	WIRING DIAGRAMS	RISER & POINT-TO-POINT (BY HARDWARE SUPPLIER)	

FUNCTION: NIGHT LATCH PANIC HARDWARE WITH ELECTRIC LATCH RETRACTION. FIXED OUTSIDE TRIM - LATCH RETRACTED BY KEY. LATCH ELECTRICALLY RETRACTED BY ACCESS CONTROL SYSTEM FOR PUSH/PULL OPERATION. INSIDE PUSH PAD RETRACTS LATCH FOR EGRESS.

HW SET 08

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	700 EPT	IVE
1	EA	POWER TRANSFER	EPT2/EPT10	VON
1	EA	ELEC PANIC HARDWARE	QEL-78-NL-OP	VON
1	EA	IC CYLINDER	AS REQUIRED	
1	EA	90 DEG OFFSET PULL	8190 10"	IVE
1	EA	OH STOP	100S	GLY
1	EA	SURFACE CLOSER	4050A / 4050A EDA	LCN
1	EA	RAIN DRIP	142	ZER
1	EA	WEATHERSTRIPPING	BY DOOR SUPPLIER	B/O
1	EA	DOOR SWEEP	8198 W/DRIP	ZER
1	EA	THRESHOLD	AS REQUIRED	ZER
1	EA	CREDENTIAL READER	BY OWNER VENDER	B/O
1	EA	POWER SUPPLY	CENTRALIZED	
1	EA	WIRING DIAGRAMS	RISER & POINT-TO-POINT (BY HARDWARE SUPPLIER)	

FUNCTION: NIGHT LATCH PANIC HARDWARE WITH ELECTRIC LATCH RETRACTION. FIXED
OUTSIDE TRIM - LATCH RETRACTED BY KEY. LATCH ELECTRICALLY RETRACTED BY CREDENTIAL
READER FOR PUSH/PULL OPERATION. INSIDE PUSH PAD RETRACTS LATCH FOR EGRESS.

HW SET 09

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	700	IVE
1	EA	CONT. HINGE	700 EPT	IVE
1	EA	POWER TRANSFER	EPT2/EPT10	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	VON
1	EA	PANIC HARDWARE	LD-78-EO	VON
1	EA	ELEC PANIC HARDWARE	QEL-78-NL-OP	VON
2	EA	IC CYLINDER	AS REQUIRED	
1	EA	90 DEG OFFSET PULL	8190 10"	IVE
2	EA	OH STOP	100S	GLY
1	EA	SURFACE CLOSER	4050A / 4050A EDA	LCN
1	EA	SURF. AUTO OPERATOR	9542IQ	LCN
2	EA	ACTUATOR, WALL OR JAMB MOUNT	8310-853 OR 8310-818 AS REQD (VERIFY TYPE AND MOUNTING LOCATION)	LCN
1	EA	RAIN DRIP	142	ZER
1	EA	WEATHERSTRIPPING	BY DOOR SUPPLIER	B/O
2	EA	DOOR SWEEP	8198 W/DRIP	ZER
1	EA	THRESHOLD	AS REQUIRED	ZER
1	EA	CREDENTIAL READER	BY OWNER VENDER	B/O
1	EA	POWER SUPPLY	CENTRALIZED	
1	EA	WIRING DIAGRAMS	RISER & POINT-TO-POINT (BY HARDWARE SUPPLIER)	

FUNCTION: NIGHT LATCH PANIC HARDWARE WITH ELECTRIC LATCH RETRACTION. FIXED OUTSIDE TRIM - LATCH RETRACTED BY KEY. LATCH ELECTRICALLY RETRACTED BY CREDENTIAL READER FOR PUSH/PULL OPERATION. INSIDE PUSH PAD RETRACTS LATCH FOR EGRESS. OUTSIDE PUSH PLATE ACTUATOR AUTOMATICALLY OPENS DOOR ONLY WHILE LATCH IS ELECTRICALLY RETRACTED. INSIDE PUSH PLATE ACTUATOR ELECTRICALLY RETRACTS LATCH AND AUTOMATICALLY OPENS DOOR AT ALL TIMES.

HW SET 10

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	PANIC HARDWARE	CD-78-NL	VON
2	EA	IC CYLINDER	AS REQUIRED	
1	EA	SURFACE CLOSER	4050A SCUSH	LCN
1	EA	KICK PLATE	8400 10"	IVE
1	EA	RAIN DRIP	142	ZER
1	SET	GASKETING	429 (MOUNT PRIOR TO CLOSER)	ZER
1	EA	DOOR SWEEP	8198 W/DRIP	ZER
1	EA	THRESHOLD	AS REQUIRED	ZER

FUNCTION: NIGHT LATCH EXIT HARDWARE. FIXED OUTSIDE TRIM - LATCH RETRACTED BY KEY. INSIDE PUSH PAD RETRACTS LATCH FOR FREE EGRESS.

HW SET 11

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	700	IVE
2	EA	PUSH/PULL BAR	9190 10"	IVE
2	EA	OH STOP	100S	GLY
1	EA	SURFACE CLOSER	4050A / 4050A EDA	LCN
1	EA	SURF. AUTO OPERATOR	9542IQ	LCN
2	EA	ACTUATOR, WALL OR JAMB MOUNT	8310-853 OR 8310-818 AS REQD (VERIFY TYPE AND MOUNTING LOCATION)	LCN

FUNCTION: PUSH/PULL. INSIDE OR OUTSIDE ACTUATOR AUTOMATICALLY OPENS DOOR.

HW SET 12

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
1	EA	PUSH PLATE	8200 6" X 16"	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	IVE
1	EA	SURFACE CLOSER	4050A / 4050A EDA	LCN
1	EA	KICK PLATE	8400 10"	IVE
1	EA	WALL STOP	WS406/407CCV	IVE

FUNCTION: PUSH/PULL.

HW SET 13

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
2	EA	PUSH PLATE	8200 6" X 16"	IVE
2	EA	PULL PLATE	8303 10" 4" X 16"	IVE
2	EA	SURFACE CLOSER	1450 FC / 1450 EDA FC	LCN
2	EA	WALL STOP	WS406/407CCV	IVE

FUNCTION: PUSH/PULL.

HW SET 14

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	HINGE	AS REQUIRED	IVE
2	EA	PUSH PLATE	8200 6" X 16"	IVE
2	EA	PULL PLATE	8303 10" 4" X 16"	IVE
1	EA	SURFACE CLOSER	4050A / 4050A EDA	LCN
1	EA	SURFACE CLOSER	4050A SCUSH	LCN
1	EA	WALL STOP	WS406/407CCV	IVE

FUNCTION: PUSH/PULL.

END OF SECTION

SECTION 08 8000 GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.nf
- B. Glazing units.
- C. Glazing compounds.

1.02 RELATED REQUIREMENTS

- A. Section 07 2600 - Vapor Retarders.
- B. Section 07 2700 - Air Barriers.
- C. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
- D. Section 08 4413 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
- I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2024.
- J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- K. GANA (GM) - GANA Glazing Manual; 2022.
- L. GANA (SM) - GANA Sealant Manual; 2008.
- M. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- N. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).
- O. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

- Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2026.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit and Coated, Laminated, Tinted and Spandrel glass. Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 12 by 12 inch in size of glass units, showing coloration and design.
- E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- F. Delegated Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.
- G. Certificate: Certify that products of this section meet or exceed specified requirements.
- H. Manufacturer's qualification statement.
- I. Installer's qualification statement.
- J. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience and approved by manufacturer.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide on-site glazing mock-up with the specified glazing components.
- C. Locate where directed.
- D. Mock-ups may remain as part of the Work.

1.08 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
- C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Glass Fabricators:
 - 1. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
 - 2. Viracon, Inc: www.viracon.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Float Glass Manufacturers:
 - 1. Cardinal Glass Industries: www.cardinalcorp.com/#sle.
 - 2. Guardian Glass, LLC: www.guardianglass.com/#sle.
 - 3. Saint Gobain North America: www.saint-gobain.com/#sle.
 - 4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: Calculated in accordance with ASCE 7. See Structural Notes on Drawings.
 - 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 4. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
 - 1. In conjunction with weather barrier related materials described in other sections, as follows:
 - a. Vapor Retarders: See Section 07 2600.
 - b. Air Barriers: See Section 07 2700.
 - 2. To utilize inner pane of multiple pane insulating glass units for continuity of vapor retarder and/or air barrier seal.
 - 3. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 - 1. Center of Glass U-Factor: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
 - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.

3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
 1. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
 2. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
 3. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.

2.04 INSULATING GLASS UNITS

- A. Manufacturers:
 1. Glass: Any of the manufacturers specified for float glass.
 2. Cardinal Glass Industries: www.cardinalcorp.com/#sle.
 3. Guardian Glass, LLC: www.guardianglass.com/#sle.
 4. Pilkington North America Inc: www.pilkington.com/na/#sle. Pilkington North America Inc: www.pilkington.com/na/#sle.
 5. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.
 6. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
 7. Oldcastle.
 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
- C. Insulating Glass Units: Types as indicated.
 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 3. Warm-Edge Spacers: Low-conductivity thermoplastic with desiccant warm-edge technology design.
 - a. Spacer Width: As required for specified insulating glass unit.
 - b. Spacer Height: Manufacturer's standard.
 4. Spacer Color: Black.
 5. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 - b. Single-sealed systems are prohibited.
 - c. Color: Black.
 6. Purge interpane space with dry air, hermetically sealed.
- D. Type IG-1 - Insulating Glass Units: Vision glass, double glazed; vacuum seal.
 1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with argon.
 3. Vacuum seal space between lites.
 4. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Low-E (passive type), on #2 surface.
 5. Warm-edge spacer.
 6. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.

7. Total Thickness: 1 inch.
 8. Visible Light Transmittance (VLT): 70 percent, nominal.
 9. Solar Heat Gain Coefficient (SHGC): .39, nominal.
 10. Visible Light Reflectance, Outside: 11 percent, nominal.
 11. Glazing Method: Dry glazing method, gasket glazing.
- E. Type IG-4 - Insulating Glass Units: Spandrel glazing.
1. Applications: Exterior spandrel glazing unless otherwise indicated.
 2. Space between lites filled with argon.
 3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Sputter Coated on second surface, on #2 surface.
 4. Warm-edge spacer.
 5. Inboard Lite: Fully tempered float glass, 1/4 inch thick.
 - a. Tint: Clear.
 - b. Opacifier: Water-based silicone spandrel coating, on #4 surface.
 - 1) Opacifier Color: Opaci-Coat-300 #3-0770 Warm Gray.
 6. Total Thickness: 1 inch.
 7. Thermal Transmittance (U-Value), Summer - Center of Glass: .22, nominal.
 8. Visible Light Reflectance, Outside: 10 percent, _____.
 9. Glazing Method: Dry glazing method, gasket glazing.

2.05 GLAZING UNITS

- A. Type G-2 - Monolithic Interior Vision Glazing:
1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Fully tempered float glass.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.
 - a. Provide 3/8 inch where spans exceed 6 feet.
 - b. Provide 1/2 inch where spans exceed 8 feet.
 - c. Provide 5/8 inch where spans exceed 10 feet.
 - d. Provide 3/4 inch where spans exceed 12 feet.

2.06 GLASS COATINGS

- A. Opacifying Coating: One component, water-based silicone elastomeric opaque color coating for roll coat and spray applications.
1. Application: Exterior spandrel location as indicated on drawings.
 - a. Glass and Coating Orientation at Spandrels: On surface facing interior.
 2. Fabrication of Glass Unit with Coating: Solely by Approved Factory Fabricators trained and certified annually by coating manufacturer.
 3. Dry Film Thickness: Between 0.004 inch and 0.006 inch, minimum.
 4. Color: Selected from manufacturer's standard range and indicated on drawings.
 5. Products:
 - a. ICD High Performance Coatings; OPACI-COAT-300: www.icdcoatings.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.07 GLAZING COMPOUNDS

- A. Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.
- B. Manufacturers:

1. Bostik Inc: www.bostik-us.com/#sle.
2. Dow Corning Corporation: www.dowcorning.com/construction/#sle. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
3. Pecora Corporation: www.pecora.com/#sle.
4. Tremco Commercial Sealants & Waterproofing; Proglaze: www.tremcosealants.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.08 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color black.
- C. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry immediately before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 08 8000

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SECTION 08 8700
ARCHITECTURAL WINDOW FILMS

PART 1 - GENERAL**1.01 SECTION INCLUDES**

- A. Privacy window film.

1.02 RELATED SECTIONS

- A. Section 08 80 00 – Glazing: Windows to receive architectural window film

1.03 REFERENCES

- A. ASTM E903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- B. ASTM E308 - Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.

1.04 SUBMITTALS

- A. Product Data: Provide manufacturers' data sheets on film and accessories.
- B. Shop Drawings: indicate layout, profiles, and product components, including dimensions, anchorage, and accessories.
- C. Samples for Verification: 4 inch by 4 inch samples of specified color and pattern of each type.
- D. Maintenance Data: Include operation and maintenance data for installed products, including precautions against harmful cleaning materials and methods.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Film: Furnish 2 percent extra material at time of installation. Deliver in protective packaging for storage and label contents appropriately.

1.05 QUALITY ASSURANCE

- A. Obtain all products in this section from a single Manufacturer with a minimum of 10 years' experience.
- B. Installer: Installation shall be performed by a trained and qualified installer, specialized and experienced in work required for this project. A list of experienced installation integrators is available at 3M.com/AMD or 3M Commercial Solutions Division at 1-888-650-3497.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier.
- C. Product must remain in original plastic bag and boxes and have storage conditions as follows:
 - 1. 40 °F – 90 °F (4 °C - 32 °C).
 - 2. Out of direct sunlight.
 - 3. Clean dry area.
 - 4. Original container.
 - 5. Do not stack boxes over six (6) units high. Excessive weight can damage the film.
 - 6. Products are not recommended for interior applications where condensation consistently occurs.
 - 7. Handle products in accordance with manufacturer's instructions.
 - 8. Shelf life: 2 years.

1.07 PROJECT/SITE CONDITIONS

- A. Confirm appropriate substrate is suitable for mounting of glass finish components prior to start of installation.
- B. Apply materials when environmental conditions are within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits. Application temperature range is 60 °F – 100 °F (16 °C – 38 °C).
- C. Environmental Limitations: Do not install until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.08 WARRANTY

- A. Manufacturer's Warranty: Submit manufacturer's standard warranty document by authorized manufacturer.
- B. Standard Product Warranty: Refer to the applicable 3M Technical Data Sheet for product warranty.

PART 2 - PRODUCTS**2.01 MANUFACTURER**

- A. Solyx Films.
- B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIAL STANDARD

- A. Design based upon 3M™ CRYSTAL Glass Finishes.

2.03 MATERIAL PROPERTIES

- A. General: Glass finishes field-applied application to glass or plastic material as visual opaque or decorative film.
- B. Film: Vinyl.
- C. Adhesive: Pressure Sensitive.
- D. Liner: Silicone-coated Polyester.
- E. Thickness (Film and Adhesive without Liner):
 - 1. Frosted - 4 mils.
- F. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84 , Class A:
 - 1. Flame Spread: 25 maximum.
 - 2. Smoke Developed: 450 maximum.

2.04 OPTICAL PERFORMANCE

- A. Frosted Decorative / Privacy Glazing Film:
 - 1. Ultraviolet Transmittance (ASTM E903): 4 percent.
 - 2. Visible Light Transmittance (ASTM E903, ASTM E308): 23 percent.

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. Examine substrate(s) for compliance. Do not proceed with installation until unsatisfactory conditions have been corrected.

- B. Refer to the applicable Solyx Technical Data Sheet to determine compatibility of finish to substrate.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.
- D. Responsibility for state of surfaces prior to installation to be pre-determined by installation specialist.
- E. Proceeding with installation implies installer's acceptance of substrate and conditions.

3.02 SURFACE PREPARATION

- A. Comply with all manufacturer's instructions for surface preparation.
- B. Thoroughly clean substrate of substances that could impair the overlay's bond, including mold, mildew, oil, grease.
- C. Re-clean surfaces with appropriate surface prep solvent and remove any haze or surface

3.03 APPLICATION

- A. Application must be performed by qualified installer.
- B. Do not proceed with installation until all finishing work has been completed in and around the work area.
- C. Verify pattern prior to material acquisition.
- D. Comply with manufacturer's installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- E. Install substrates with no gaps or overlaps. Form smooth, wrinkle-free, bubble-free surface for finished installation.
- F. Remove air bubbles, wrinkles, blisters and other defects. Use approved procedures to prevent the formation of air bubbles, wrinkles, blisters and other defects.
- G. Refer to the applicable Solyx Installation Guide for additional details.

3.04 CLEANING AND PROTECTION

- A. Use cleaning methods recommended by architectural surfacing manufacturer for applicable environment.
- B. Protect completed glass finish during remainder of construction period.
- C. Consult with authorized installation specialist for project specifics.

END OF SECTION 08 8700

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**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Acoustic insulation.
- E. Cementitious backing board.
- F. Gypsum wallboard.
- G. Joint treatment and accessories.
- H. Textured finish system.

1.02 RELATED REQUIREMENTS

- A. Section 05 4000 - Cold-Formed Metal Framing: Structural steel stud framing.
- B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 2100 - Thermal Insulation: Acoustic insulation.
- D. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
- E. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- F. Section 09 2216 - Non-Structural Metal Framing.

1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2024.
- B. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
- C. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- D. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2020.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
- G. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2025.
- H. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- I. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- J. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- K. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.

- L. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
- M. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- N. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
- O. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- P. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- Q. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2024.
- R. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019 (Reapproved 2024).
- S. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- T. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- U. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- V. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.
- W. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
 - 2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
 - 1. Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.
- D. Samples: Submit two samples of gypsum board finished with proposed texture application, 18 by 18 inches in size, indicating finish color and texture.
- E. Mockups: Provide an area of approximately 10' by 10' with the proposed texture application for an onsite mockup. Schedule at least one week in advance, for review of the Architect/Owner, prior to proceeding. Coordinate location with Architect. Mockup may remain as part of the work, upon approval.
- F. Steel Framing Industry Association (SFIA) Certification:

1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.
- G. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- H. SSFSA Manufacturer Qualification: Submit documentation of manufacturer association membership.
- I. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.
- J. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- B. SFIA Code Compliance Certification Program: www.CFSteel.org/#sle: Use metal studs and connectors certified for compliance with International Building Code.
- C. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com/#sle.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- E. Documents at Project Site: Maintain at the project site a copy of manufacturer's instructions, erection drawings, and shop drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- C. Store metal products to prevent corrosion.
- D. Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- E. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- F. Do not install panels that are wet, moisture damaged, and mold damaged.
- G. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
- H. Indications that panels are mold damaged include, but are not limited to, fuzzy or plotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
 1. See PART 3 for finishing requirements.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:

1. Acoustic Attenuation: STC of 45-49, or as indicated on drawings, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
2. Refer to drawings for additional STC requirements of wall systems.
- C. Grid Suspension Systems: Provide grid suspension systems in accordance with ASTM C840 and GA-216 complying with the following:
 1. ICC-ES Evaluation Report No. _____.
- D. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:

2.02 METAL FRAMING MATERIALS

- A. Material and Product Requirements: AISI S201 and AISI S220.
- B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
 1. Structural Grade: As required to meet design criteria.
 2. Corrosion Protection Coating Designation: G40, or equivalent in accordance with AISI S220.
- C. Manufacturers - Metal Framing, Connectors, and Accessories:
 1. ClarkDietrich: www.clarkdietrich.com/#sle.
 2. Jaimes Industries: www.jaimesind.com/#sle.
 3. MarinoWARE: www.marinoware.com/#sle.
 4. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
 5. R-stud: www.rstud.com/#sle.
 6. SCAFCO Corporation: www.scafco.com/#sle.
 7. Steel Construction Systems: www.steelconsystems.com/#sle.
 8. Substitutions: See Section 01 6000 - Product Requirements.
- D. Nonstructural Steel Framing for Application of Gypsum Board: See Section 09 2216.
- E. Structural Steel Framing for Application of Gypsum Board: See Section 05 4000.
- F. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
 1. Studs: C-shaped with knurled or embossed faces.
 2. Runners: U shaped, sized to match studs.
 3. Ceiling Channels: C-shaped.
 4. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.
 5. Furring Members: U-shaped sections, minimum depth of 3/4 inch.
 6. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.
- G. Shaft Wall Studs and Accessories: Galvanized sheet steel.
- H. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent rotation of studs while maintaining structural performance of partition.
 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
 2. Material: ASTM A653/A653M steel sheet, SS Grade 50, with G60 hot-dip galvanized coating.
 3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.

4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-resistance rating of the wall assembly.
- I. Nonstructural Framing Accessories:
 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
 3. Framing Connectors: ASTM A653/A653M, G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 1. American Gypsum Company: www.americangypsum.com/#sle.
 2. CertainTeed Corporation: www.certainteed.com/#sle.
 3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 4. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
 5. PABCO Gypsum: www.pabco gypsum.com/#sle.
 6. USG Corporation: www.usg.com/#sle.
 7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold resistant board is required _____.
 4. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 5. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
 6. Paper-Faced Products:
 7. Mold-Resistant, Paper-Faced Products:
- C. Abuse Resistant Wallboard:
 1. Application: High-traffic areas indicated.
 2. Surface Abrasion: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 4. Soft Body Impact: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 6. Type: Fire-resistance-rated Type X, UL or WH listed.
 7. Thickness: 5/8 inch.
 8. Edges: Tapered.
- D. Backing Board For Wet Areas: One of the following products:
 1. Application: Surfaces behind tile in wet areas, including tub and shower surrounds and shower ceilings.

- E. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 4. Type: Regular and Type X, in locations indicated.
 5. Type X Thickness: 5/8 inch.
 6. Regular Board Thickness: 5/8 inch.
 7. Edges: Tapered.
 8. Products:
 - a. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
 - b. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board: www.gpgypsum.com/#sle.
 - c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.

2.04 GYPSUM BOARD ACCESSORIES

- A. Acoustic Insulation: See Section 07 2100.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
1. Products:
 - a. Franklin International, Inc; Titebond Acoustical Smoke & Sound Sealant: www.titebond.com/#sle.
 - b. Liquid Nails, a brand of PPG Architectural Coatings: www.liquidnails.com/#sle.
 - c. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
1. Corner Beads: Low profile, for 90 degree outside corners.
 - a. Products:
 - 1) CertainTeed Corporation; No-Coat Drywall Corner: www.certainteed.com/#sle.
 - 2) ClarkDietrich; Strait-Flex OS-300: www.clarkdietrich.com/#sle.
 - 3) Flannery, Inc; Corner Beads: www.flannerytrim.com/#sle.
 - 4) Phillips Manufacturing Co; Everlast Corner Bead: www.phillipsmfg.com/#sle.
 - 5) Trim-Tex, Inc: www.trim-tex.com/#sle.
 2. Splayed Corner Beads with Paper Face: _____.
 3. L-Trim with Tear-Away Strip: Sized to fit 5/8-inch thick gypsum wallboard.
 4. Expansion Joints:
 - a. Fire-Resistance Rated: 1 hour when joint system tested in accordance with UL 2079.
 - b. Type: V-shaped metal with factory-installed protective tape.
- D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
- E. Textured Finish Materials: Latex-based compound; plain.
1. Products:

- a. CertainTeed Corporation; Extreme Texture Coat/Acrylic Texture with M2Tech: www.certainteed.com/#sle.
- b. Sherwin-Williams; Tuff Surface Premium Texture Finish: www.sherwin-williams.com/#sle.
- F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
- B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

3.03 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
- C. Studs: Space studs at 16 inches on center.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - 1. Orientation: Vertical.
 - 2. Spacing: As indicated.
- F. Blocking: Install wood blocking for support of:
 - 1. Framed openings.
 - 2. Wall-mounted cabinets.
 - 3. Toilet accessories.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 1. Place continuous bead at perimeter of each layer of gypsum board.

2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.05 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- E. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated on drawings.
 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 2. Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.07 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish, continuous planes greater than 30' in any direction, and other areas specifically indicated.
 - a. Include walls to receive wall coverings and custom-printed films.
 - b. Include gypsum board ceilings.
 2. Level 4: Walls and ceilings to receive paint finish, unless otherwise indicated.
 3. Level 3: Walls to receive textured wall finish.
 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 5. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.08 TEXTURE FINISH

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes, prior to surface being textured. Apply primer to surfaces that are clean, dry, and smooth.
- B. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
- C. Texture Required: Light Orange Peel.

3.09 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.10 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Clean walls and all surrounding materials of drywall dust, texture overspray, and other incidental blemishes. .

3.11 PROTECTION

- A. Protect installed gypsum board assemblies from subsequent construction operations.
- B. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- C. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- D. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 09 2116

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SECTION 09 2216
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

1.02 RELATED REQUIREMENTS**1.03 REFERENCE STANDARDS**

- A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
- E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2025.
- F. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.
- G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
 - 2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. Manufacturer Reports: Include research reports indicating compliance with applicable building codes.
- F. Manufacturer's qualification statement.
- G. SFIA Manufacturer Qualification: Submit documentation of manufacturer association membership.
- H. SSFSA Manufacturer Qualification: Submit documentation of manufacturer association membership.
- I. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.

- J. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.
- B. Manufacturer Qualifications:
1. Company specializing in manufacturing the types of products specified in this section, and with minimum 3 years of documented experience.
 2. Member of Steel Framing Industry Association (SFIA).
 3. Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com/#sle.
 4. Member of Supreme Steel Framing System Association (SSFSA): www.ssfsa.com/#sle.

1.06 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide mock-up of stud wall, ceiling, and soffit framing including insulation, sheathing, window frame, and door frame and finish specified in other sections. Coordinate with installation of associated work specified in other sections.
1. Mock-up Size: Full-height, minimum 12 feet long, including corner.
 2. Mock-up Size and Location: As indicated on drawings.
 3. Mock-up may remain as part of the Work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
1. CEMCO: www.cemcosteel.com/#sle.
 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 3. Jaimes Industries: www.jaimesind.com/#sle.
 4. MarinoWARE: www.marinoware.com/#sle.
 5. MRI Steel Framing: www.mristeel framing.com/#sle.
 6. R-stud: www.rstud.com/#sle.
 7. SCAFCO Corporation: www.scafco.com/#sle.
 8. Simpson Strong Tie: www.strongtie.com/#sle.
 9. Steel Construction Systems: www.steelconsystems.com/#sle.
 10. Steeler Inc: www.steeler.com/#sle.
 11. Super Stud Building Products, Inc: www.buysuperstud.com/#sle.
 12. Telling Industries: www.tellingindustries.com/#sle.
 13. The Steel Network, Inc: www.SteelNetwork.com/#sle.
 14. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220.
1. Structural Grade: As required to meet design criteria.
 2. Corrosion Protection Coating Designation: G40, or equivalent in accordance with AISI S220.
- B. Material and Product Requirements: AISI S201 and AISI S220.
- C. Nonstructural Framing System Components: Sheet steel, of size and properties necessary for spacing indicated on drawings, with maximum wall framing deflection of L/120 at 10 psf.

1. Studs: C-shaped with flat faces.
 - a. Products:
 - 1) ClarkDietrich; ProSTUD: www.clarkdietrich.com/#sle.
 - 2) Ironline Metals; Bantam Stud: www.ironlinemetals.com/#sle.
 - 3) MarinoWARE; ViperStud Drywall Framing: www.marinoware.com/#sle.
 - 4) MBA Building Supplies; ProSTUD: www.mbastuds.com/#sle.
 - 5) MRI Steel Framing; MRI Traditional - Non-Structural: www.mristeel framing.com/#sle.
 - 6) R-stud; R-stud: www.rstud.com/#sle.
 - 7) Steeler Inc; ELITE Steel Framing System: www.steeler.com/#sle.
 - 8) Super Stud Building Products, Inc; The EDGE: www.buysuperstud.com/#sle.
 - 9) Substitutions: See Section 01 6000 - Product Requirements.
 2. Runners: U-shaped, sized to match studs.
 - a. Products:
 - 1) Ironline Metals; Bantam Track: www.ironlinemetals.com/#sle.
 - 2) MRI Steel Framing; MRI Smart EQ Track: www.mristeel framing.com/#sle.
 - 3) Substitutions: See Section 01 6000 - Product Requirements.
 3. Ceiling Channels: U-shaped.
 - a. Products:
 - 1) MRI Steel Framing; MRI U-Channel: www.mristeel framing.com/#sle.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.
 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
 - a. Products:
 5. Furring: Z-shaped sections, minimum depth of 1 inch.
 - a. Thickness: 25 gauge, 0.0209 inch.
 - b. Products:
 - 1) MRI Steel Framing; MRI Z-furring: www.mristeel framing.com/#sle.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.
 6. Steel Angle: 90-degree angle-shaped sections, minimum leg length of 3/4 inch.
 - a. Thickness: 25 gauge, 0.0209 inch.
 - b. Products:
 - 1) MRI Steel Framing; MRI Angle: www.mristeel framing.com/#sle.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.
- D. Nonstructural Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
 - a. Material: ASTM A653/A653M steel sheet with factory-welded steel plate base.
 - 1) Height: 34 inches.
 - 2) Products:
 - (a) SCAFCO Corporation: www.scafco.com/#sle.
 - (b) Steeler, Inc: www.steeler.com/#sle.
 - b. Materials: ASTM A1011/A1011M sheet steel support member with factory-welded ASTM A36/A36M steel plate base.
 - 1) Height: 23-5/8 inches.
 - 2) Products:
 - (a) ClarkDietrich; Pony Wall (PW): www.clarkdietrich.com/#sle.
 - (b) Substitutions: See Section 01 6000 - Product Requirements.

3. Partial Height Wall Base Connector: Provides reinforcement at base of partial height walls.
 - a. Material: ASTM A653/A653M, G90 galvanized steel.
4. Bracing and Bridging: ASTM A653/A653M, G90 galvanized steel; for lateral bracing of wall studs with slots for engaging on-module studs.
 - a. Products:
 - 1) Simpson Strong-Tie; DBR Drywall Spacer Bracer: www.strongtie.com/#sle.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.

2.03 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.
- C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING

- A. Install non-structural members in accordance with ASTM C754.
- B. Install structural members and connections in accordance with ASTM C1007.
- C. Extend partition framing to structure where indicated and to ceiling in other locations.
- D. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- E. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs as indicated.
- F. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- G. Align and secure top and bottom runners at 24 inches on center.
- H. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- I. Install studs vertically at 12 inches on center.
- J. Install studs vertically at spacing indicated on drawings.
- K. Align stud web openings horizontally.
- L. Secure studs to tracks using crimping method. Do not weld.
- M. Stud splicing is not permissible.
- N. Stud splicing is permissible; splice studs with 8 inch nested lap, secure each stud flange with flush head screw.
- O. Fabricate corners using a minimum of three studs.
- P. Install double studs at wall openings, door and window jambs, not more than 2 inches from each side of openings.
- Q. Brace stud framing system rigid.

- R. Coordinate erection of studs with requirements of door frames; install supports and attachments.
- S. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- T. Sound Isolation Clips: Mechanically attach to framing or structure with fasteners recommended by clip manufacturer. Install at spacing indicated on drawings.
- U. Furring: Coordinate with sound isolation clip spacing and locations. Lap splices a minimum of 6 inches.

3.03 CEILING AND SOFFIT FRAMING

- A. Comply with requirements of ASTM C754.
- B. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- C. Install furring independent of walls, columns, and above-ceiling work.
- D. Securely anchor hangers to structural members or embed them in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- E. Space main carrying channels at maximum 72 inches on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- F. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- G. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
- H. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.
- I. Laterally brace suspension system.

3.04 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION 09 2216

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SECTION 09 3000 TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Tile for stairs.
- D. Edge-protection and transition profiles for floors.
- E. Finishing and edge-protection for walls.
- F. Finishing and edge protection profiles for stair nosings.
- G. Movement joint and cove-shaped profiles.
- H. Uncoupling membrane.
- I. Waterproofing membrane.
- J. Cementitious backer board as tile substrate.
- K. Coated glass mat backer board as tile substrate.
- L. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.
- C. Section 10 2800 - Toilet, Bath, and Laundry Accessories.
- D. Section 22 4000 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
- B. ASTM D2370 - Standard Test Method for Tensile Properties of Organic Coatings; 2016 (Reapproved 2021).
- C. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2025-2026.
- D. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2026.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct conference at the project site.
 - 1. Convene one month prior to commencing work of this section.
 - 2. Require attendance of installation material manufacturer, tile supplier, tile installer and installers of related work. Review installation procedures and coordination required with related work.
 - 3. Meeting agenda includes but is not limited to:
 - a. Surface preparation.
 - b. Tile and installation material compatibility.
 - c. Manufacturer and installer warranty duration and scope covered by warranty.
 - d. Edge protection, transition, and pre-fabricated movement joint profiles.

- e. Waterproofing techniques.
- f. Crack isolation techniques.
- g. Control and expansion joints.
- h. Floor drain in coordination with floor tile.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples for Verification:
 - 1. Full-size units of each type of composition of tiles.
 - 2. Metal edge strips in 6-inch lengths.
 - 3. Physical sample deck of grout color options.
- E. Manufacturer's Certificate: Certify products of this section meet or exceed specified requirements.
- F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than 5 boxes of each color and type.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.
 - a. Installer to provide references and examples upon request of Architect and/or Owner.
- B. Documents on Site: Maintain one copy of ANSI A108/A118/A136, TCNA (HB), and TCNA (HB-GP) on site.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect and Owner.
 - 3. Refinish mock-up area as required to produce acceptable work.
 - 4. Mock-ups are to be provided upon request at no cost to the owner.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

- C. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- D. Store aggregates where grading and other requirement characteristics can be maintained and contamination can be avoided.
- E. Store liquid materials in unopened containers and protected from freezing.

1.09 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at levels indicated in referenced standards and manufacturer's written instructions.

1.10 WARRANTY

- A. The contractor warrants the work of this section to be in accordance with the contract documents and free from faults and defects in materials and workmanship for a period of 10 years.
 - 1. Warranties that are affected by a single-source manufacturer requirement is expected and should be included.
- B. The manufacturer of adhesives, mortars, grouts, and/or other installation materials shall provide a warranty in accordance with requirements for this project.
- C. Warranty document showing duration and scope to be submitted with product submittals.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Source limitations for tile: Obtain tile of each type and color or finish from single source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area. If area covered requires more than one production run of material coordination with Architect on pattern/blending as required.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this section from a single manufacturer.
 - 1. Waterproof membrane.
 - 2. Crack isolation membrane.
 - 3. Metal edge strips.

2.02 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with standard grade requirements unless otherwise indicated.
 - 2. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.2, ANSI standards referenced in other articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
 - 3. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved samples.

4. Mounting: For factory-mounted tile, provide back or edge mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - a. Where tile is indicated for installation in wet areas, do not use back or edge mounted tile assemblies unless tile manufacturer specified in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.03 TILE PRODUCT

- A. Tile Type: As indicated on Drawings.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include those indicated on Drawings.
 1. Size: As indicated on Drawings.
 - a. Where indicated on Drawings, any tile product with a single side at 24" in length or greater will require a tile leveling system to be utilized during installation.
 2. Face: As indicated on Drawings.
 3. Tile Color and Pattern: As indicated on Drawings.

2.04 TRIM AND ACCESSORIES

- A. Edge Protection and Transition Profiles for Floors: Angle or L-Shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; exposed-edge material.
 1. Applications: As indicated on Drawings.
 - a. Thresholds at door openings.
 - b. Open edges of floor tile.
 - c. Transition between floor finishes of different heights.
 2. Profile: As indicated on Drawings.
 3. Finish: As indicated on Drawings.
 4. Accessories: Include matching inside and outside corners, internal connectors, and anchoring legs matching trim profiles.
 5. Products:
 - a. Schluter-Systems; (Basis of Design): www.schluter.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Finishing and Edge Protection for Walls: Angle or L-Shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for wall applications; op and vertical wall sections that together form the visible surface.
 1. Applications: As indicated on Drawings.
 - a. Open edges of wall tile.
 - b. Inside and outside wall corners.
 - c. Transition between different finishes or as designated on Drawings.
 2. Profile: As indicated on Drawings.
 3. Finish: As indicated on Drawings.
 4. Accessories: Include matching inside and outside corners, internal connectors, and anchoring legs matching trim profiles.
 5. Products:
 - a. Schluter-Systems; (Basis of Design): www.schluter.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Finishing and Edge Protection for Stair Nosings: Roll-Formed Metal Profile with exposed surface and leading edge, and anchoring leg. Height to match tile and setting-bed thickness.

1. Applications: As indicated on Drawings.
 2. Profile: As indicated on Drawings.
 3. Finish: As indicated on Drawings.
 4. Accessories: Provide with matching end caps are required.
 5. Products:
 - a. Schluter-Systems; (Basis of Design): www.schluter.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Movement Joints and Cove Shaped Profiles: Metal Profile with integrated anchoring legs, connected at a 90-degree angle by a cove shaped radius that forms the visible surface. Height to match tile and setting-bed thickness.
1. Applications: As indicated on Drawings.
 2. Profile: As indicated on Drawings.
 3. Finish: As indicated on Drawings.
 4. Accessories: Include matching inside and outside corners, internal connectors, and end caps matching trim profiles.
 5. Products:
 - a. Schluter-Systems; (Basis of Design): www.schluter.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- E. Surface and Expansion Joint Profiles: Prefabricated movement joint profile with anchoring legs that forms the visible surface.
1. Applications: Floor and wall surfaces including but not limited to cold and soft joints, or as indicated on Drawings.
 - a. As required by ASTM 108 and TCNA.
 - b. All expansion, construction, cold, saw-cut, isolation, contraction, and seismic joints.
 - c. Perimeter and field movement joints within a tile installation, unless other profile is indicated.
 - d. Changes in plane and interior-movement joints at all inside corners, unless other profile is indicated.
 - e. Same plane movement joints.
 - 1) Maximum of 24 feet in each direction. If in direct sunlight, heat or moisture maximum of 12 feet in each direction.
 2. Profile: As indicated on Drawings.
 3. Finish: As indicated on Drawings.
 4. Products: As indicated on Drawings.
 - a. Schluter-Systems; (Basis of Design): www.schluter.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 SETTING MATERIALS

- A. Provide setting and grout materials from same manufacturer, unless otherwise noted and or indicated in manufacturer's warranty
- B. Latex-Portland Cement Mortar Bond Coat (thinset):
1. Applications: For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.15 and A118.1
 2. Products:
 - a. TEC Specialty Products LLC: www.tecspecialty.com/#sle.
 - b. LATICRETE International, Inc: www.laticrete.com/#sle.
 - c. Mapei Corporation: www.mapei.com/#sle.
 - d. Schluter-Systems: www.schluter.com/#sle.

- e. Substitutions: See Section 01 6000 - Product Requirements.

2.06 GROUTS

- A. Provide setting and grout materials from same manufacturer, unless otherwise noted and or indicated in manufacturer's warranty.
- B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
 - 1. Applications: Standard interior non-wet locations.
 - 2. Grout Joints: As indicated in TCNA guidelines.
 - 3. Color(s): As indicated on Drawings.
 - 4. Products:
 - a. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 - 1. Applications: Wet locations, excluding kitchens.
 - 2. Grout Joints: As indicated in TCNA guidelines.
 - 3. Color(s): As indicated on Drawings.
 - 4. Products:
 - a. TEC Specialty Products LLC; TEC AccuColor EFX Epoxy Special Effects Grout: www.tecspecialty.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Epoxy Grout: Chemical resistant industrial grade epoxy grout.
 - 1. Applications: Kitchens.
 - 2. Grout Joints: As indicated in TCNA guidelines.
 - 3. Color(s): As indicated on Drawings.
 - 4. Products:
 - a. LATICRETE International, Inc; SPECTRALOCK 2000 IG: www.laticrete.com/#sle.

2.07 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, modified silane polymer, or urethane sealant; moisture- and mildew-resistant type.
 - 1. Applications: Between tile and plumbing fixtures, inside corners of tiled walls, and between tile wall and countertops .
 - 2. Color(s): To match grout color or countertop color. Coordinate with Architect.

2.08 ACCESSORY MATERIALS

- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
 - 1. Crack Resistance: No failure at 1/8 inch gap, minimum.
 - 2. Bonded Sheet Membrane Type:
 - a. Material: Polyethylene sheet membrane with polyester fleece laminated to underside
 - b. Products:
 - 1) Schluter-Systems (Basis of Design); DITRA: www.schluter.com/#sle.
 - 2) Laticrete; STRATA MAT XT: www.laticrete.com/#sle.
 - 3) Substitutions: See Section 01 6000 - Product Requirements.
- B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 - 1. Bonded Sheet Membrane Type:

- a. Material: High-density polyethylene sheet membrane with nonwoven polypropylene laminated to its underside
 - b. Products:
 - 1) Schluter-Systems (Basis of Design); DITRA: www.schluter.com/#sle.
 - 2) Waterproofing Seaming Membrane : Schluter-Systems; (Basis of Design); KERDI BAND: www.schluter.com/#sle.
 - (a) Location: Seams and corners.
 - 3) Substitutions: See Section 01 6000 - Product Requirements.
- C. Cementitious Backer Panel:
- 1. Application: Wall Surfaces as Required by ANSI A118.9, ASTM A108.11 and ASTM C1325 provide with manufacturer's standard edges.
 - 2. Products:
 - a. Manufacturer: USG Corporation, LLC (Basis of Design); USG Durock Cement Board.
 - b. Thickness: 5/8 inches.
 - c. Mold Resistance: ASTM D3273 and ASTM D3274.
 - d. Minimum Bending Radius: 6 feet.
 - 3. Fastener Requirements: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and application.
 - a. Screws for fastening gypsum sheathing to cold-formed metal framing with corrosion-resistant coating.
 - b. See sections as it relates to waterproofing requirements.
- D. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.
- E. Surface and Expansion Joint Profiles: One component, neutral cure, exterior grade silicone sealant and meeting the following requirements (product must meet ASTM C920).
- 1. Application: Floor and wall surfaces including but not limited to cold and soft joints.
 - a. As required by ASTM 108 and TCNA.
 - b. All expansion, construction, control, cold, saw-cut, isolation, contraction, and seismic joints.
 - c. Perimeter and field movement joints within a tile installation.
 - d. Changes in the plane and interior-movement joints at all inside corners.
 - e. Same plane movement joints.
 - 1) Maximum of every 24 feet in each direction. If in direct sunlight, heat or moisture maximum of 12 feet in each direction.
 - 2. Tensile Strength (ASTM C794): 280 PSI (1.9 MPa).
 - 3. Hardness (ASTM D751; Shore A): 25 (colored sealant)/15 (clear sealant).
 - 4. Weather Resistance (QUV Weather-ometer): 10,000 (no change).
 - 5. VOC Emissions: ≤ 0.5 mg/m³
 - 6. VOC Content: ≤ 37.16 g/L
 - 7. Products:
 - a. LATICRETE International, Inc: www.laticrete.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.
 - 1. Sub-contractor is responsible for notifying General Contractor and Architect if subfloor surfaces do not meet requirements.

2. In project instances where additional leveling work is needed, the sub-contractor is required to include this as an allowance if needed in bid.
- B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

3.02 INSTALLATION - GENERAL

- A. Install tile, thresholds, stair treads, and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- B. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Install non-ceramic trim in accordance with manufacturer's instructions.
- F. Install thresholds where indicated per manufacturer's instructions..
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep control and expansion joints free of mortar, grout, and adhesive.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.
- K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.03 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Remove grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.04 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

- B. Prohibit foot and wheel traffic over finished floor surface for at least seven days after installation.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 09 3000

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**SECTION 09 5100
ACOUSTICAL CEILINGS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

- A. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
- C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- D. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- G. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.
- H. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.
- I. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.
- J. ISO 14644-1 - Cleanrooms and Associated Controlled Environments - Part 1: Classification of Air Cleanliness by Particle Concentration; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical tile ceiling installation.
- B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension-system members.
 - 2. Structural members to which suspension system will be attached.

3. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Diffusers.
 - c. Grilles.
 - d. Speakers.
 - e. Sprinklers.
 - f. Access panels.
 - g. Perimeter moldings.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Samples: Submit one sample 6 by 6 inches in size illustrating material and finish of acoustical units.
- E. Samples: Submit one sample each, 6 inches long, of suspension system main runner, cross runner, and perimeter molding.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Manufacturer's qualification statement.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 01 6000 - Product Requirements, for additional provisions.
 2. Extra Acoustical Units: Quantity equal to 2 percent of total installed.

1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Mockup at owner's discretion at no cost to the owner.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspended-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical tiles, permit them to reach room temperature and stabilized moisture content.
- C. Handle tiles carefully to avoid chipping edges or damaging units in any way.

1.08 FIELD CONDITIONS

- A. Maintain uniform temperatures to manufacturer's recommended temperatures and humidity requirements prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling tile and its supporting suspension system from a single source.

- B. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc (Basis of Design): www.armstrongceilings.com/#sle.
 - 2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
 - 3. Chicago Metallic Corporation
 - 4. USG Corporation: www.usg.com/ceilings/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- C. Suspension Systems:
 - 1. Same as for acoustical units.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 .

2.03 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Tiles (ACT): Painted mineral fiber, with the following characteristics:
 - 1. Application(s): Typical.
 - 2. Classification: ASTM E1264 Type A.
 - 3. Size: 24 by 24 inches.
 - 4. Thickness: 3/4 inch.
 - 5. Light Reflectance: Not less than 0.85, determined in accordance with ASTM E1264.
 - 6. NRC Range: Not less than 0.75, determined in accordance with ASTM E1264.
 - 7. Ceiling Attenuation Class (CAC): Not less than 35, determined in accordance with ASTM E1264.
 - 8. Tile Edge: Tegular.
 - 9. Color: As indicated on Drawings.
 - 10. Suspension System: Exposed grid.
 - 11. Basis-of-Design Products:
 - a. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
 - b. USG Corporation: www.usg.com/ceilings/#sle.
- C. Acoustical Panels, (ACT): Mineral fiber with scrubbable finish, with the following characteristics:
 - 1. Classification: ASTM E1264 Type A.
 - 2. Size: 24 by 24 inches.
 - 3. Thickness: 5/8 inch.
 - 4. Panel Edge: Square.
 - 5. Color: As indicated on Drawings.
 - 6. Suspension System: Exposed grid.

2.04 SUSPENSION SYSTEMS

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, and splices as required.
 - 1. Materials:
 - a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
 - b. Aluminum Grid: Aluminum sheet, ASTM B209/B209M.

- B. Exposed Suspension System: Hot-dip galvanized steel grid with steel cap.
 - 1. Applications: ACT-1, ACT-3.
 - 2. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
 - 3. Profile: Tee; 15/16 inch face width.
 - 4. Finish: Baked enamel.
 - 5. Color: White.
- C. Exposed Suspension System: Aluminum grid and cap.
 - 1. Applications: ACT-2.
 - 2. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
 - 3. Clean Room Classification: ISO 14644-1, Class 5.
 - 4. Profile: Tee; 15/16 inch face width.
 - 5. Finish: Baked enamel.

2.05 ACCESSORIES

- A. Hanger Wire, Carbon-Steel, and Ties:
 - 1. 12 gauge, 0.08 inch galvanized steel wire.
 - 2. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
- B. Hold-Down Clips: Manufacturer's standard clips to suit application.
 - 1. Basis-of-Design: Armstrong #44 or equivalent.
 - 2. Use one clip every 24 inches.
- C. Perimeter Moldings: Same metal and finish as grid.
 - 1. Size: As required for installation conditions.
 - 2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
 - 3. Alternates to be approved by Architect.
- D. Metal Edge Trim for Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
 - 1. Trim Height: 6 inch.
 - 2. Finish: Baked enamel.
 - 3. Color: To match adjacent trim.
 - 4. Products:
 - a. Armstrong World Industries, Inc. (Basis of Design); AXIOM Classic:
www.armstrongceilings.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 - 1) Brake metal trim is not acceptable.
- E. Touch-up Paint: Type and color to match acoustical tile and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- C. Verify that layout of hangers will not interfere with other work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Install after major above-ceiling work is complete.
- B. Coordinate the location of hangers with other work.
- C. Layout openings for penetrations centered on the penetrating items.
- D. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

3.03 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions, as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected plan.
- D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Miter corners.
- E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's written instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twists, warps, and dents.
- E. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.
- F. Install hold-down clips on panels within 20 ft of an exterior door .

3.05 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.06 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- C. Replace damaged or abraded components.

END OF SECTION 09 5100

**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Resilient base.
- B. Resilient stair accessories.
- C. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 4100 - Architectural Wood Casework.

1.03 REFERENCE STANDARDS

- A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers; 1998 (Reapproved 2023).
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- C. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine; 2025.
- D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- E. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).
- F. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- H. UL 2824 - GREENGUARD Certification Program Method for Measuring Microbial Resistance from Various Sources Using Static Environmental Chambers; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Verification Samples: Submit one sample, illustrating color and pattern for each resilient flooring and accessory product specified.
- D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- E. Certification: Prior to installation of flooring, submit a written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

- I. Maintenance Materials: Furnish extra materials from the same product run, that match products installed and that are packaged with protective covering for storage and identified with label describing contents.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Wall Base: 10 linear feet for every 500 linear feet or fraction thereof, of each type and color, pattern, and size.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between as recommended by the manufacturer.
- D. Do not double stack pallets.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F or recommended by manufacturer.

PART 2 PRODUCTS

2.01 STAIR COVERING

- A. Stair Nosings (RN): 1-1/2 inch horizontal return, 1-1/8 inch vertical return, full width of stair tread in one piece.
 - 1. Manufacturers:
 - a. Tarkett Flooring (Basis of Design): www.tarkett.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Material: Rubber.
 - 3. Nominal Thickness: 0.125 inch.
 - 4. Striping: 2 inch wide contrasting color abrasive strips.
 - 5. Texture: Smooth.
 - 6. Color: As indicated on Drawings.

2.02 RESILIENT BASE

- A. Resilient Base (RB): ASTM F1861, Type TS, rubber, vulcanized thermoset; style as scheduled.
 - 1. Manufacturers:
 - a. Tarkett Flooring (Basis of Design): www.tarkett.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Height: As indicated on Drawings.
 - 3. Thickness: As indicated on Drawings.
 - 4. Length: 8 foot lengths
 - 5. Color: As indicated on Drawings.

6. Accessories: Job formed external corners and internal corners.

2.03 ACCESSORIES

- A. Moldings, Transition and Edge Strips: Rubber.
 1. Material & Color: As indicated on Drawings.
 2. Type: As indicated on Drawings.
 3. Size: As indicated on Drawings.
 4. Manufacturers:
 - a. Tarkett; Finishing Accessories (Basis of Design): www.commercial.tarkett.com/.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
 1. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
 3. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 4. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by flooring manufacturer. Do not use solvents.
- D. Fill cracks, holes, and depressions in substrates with trowable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- E. Verify that required floor-mounted utilities are in correct location.
- F. Do not install flooring until materials are the same temperature as space where they are to be installed.
 1. At least 48 hours in advance of installation, move resilient floor and installation materials into space where they will be installed.
- G. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient flooring.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.

- C. Finished resilient products to be installed in a fully conditioned building to maintain consistent temperature and humidity levels throughout the process. Avoid using space heaters or any other methods that can cause sudden fluctuations in heat, this can lead to expansion or contraction of the flooring material, potentially causing gaps, warping, or uneven installation.
- D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
 - 1. Resilient Strips: Attach to substrate using adhesive.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.

3.05 INSTALLATION - STAIR COVERINGS

- A. Install stair coverings in one piece for full width and depth of tread.
- B. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
- C. Tightly adhere to substrates throughout length of each piece.
- D. For treads installed as separate, equal-length units, install to produce a flush joint between units.
- E. Adhere over entire surface. Fit accurately and securely.

3.06 INSTALLATION - ACCESSORIES

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Install accessories on solid backing. Bond tightly to floor surfaces.
- C. Scribe and fit to door frames and other interruptions.

3.07 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.
- C. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surface thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.

3.08 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.
- B. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- C. Cover floor tile until Substantial Completion.

END OF SECTION 09 6500

**SECTION 09 6813
TILE CARPETING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.
- B. Section 09 3000 - Tiling - Adjacent tiling and metal profiles.
- C. Section 09 6500 - Resilient Flooring: Resilient wall base and accessories installed with carpet.

1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- F. CRI 104 - Standard for Installation of Commercial Carpet; 2018.
- G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's written data on specified products, describing physical, performance, durability, and fade resistance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: For carpet tile installation, plans showing the following:
 - 1. Columns, doorways, enclosed walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation and pattern of installation location and direction.
 - 5. Location of edge, transition, and other accessory strips.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet type selected.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and recommendations for each type of substrate.
- F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

- G. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Full-sized units equal to 5 percent of total installed of each color and pattern, but not less than 1 carton.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.
 - 1. References upon owners request
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
- B. Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have a pH range recommended by carpet tile manufacturer.

1.07 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. More than 10 percent edge raveling, snags, and runs.
 - 2. Dimensional instability.
 - 3. Loss of face fiber.
 - 4. Delamination.
- B. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tile Carpeting: Manufacturers subject to compliance with requirements, provide products indicated on Drawings by the following:
 - 1. J&J Flooring; J&J Industries Inc.: www.jjflooringgroup.com.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Tile CarpetingWOM: Tufted, manufactured in one color dye lot.
 - 1. Tile Size: As indicated on Drawings.
 - 2. Color: As indicated on Drawings
 - 3. Pattern: As indicated on Drawings
 - 4. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").

2.03 ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type. Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects.
- C. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- D. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- E. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH). Verify that finishes comply with requirements in Section 03 3000 - Cast-in-Place Concrete and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- F. Verify that required floor-mounted utilities are in correct location.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- B. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- C. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- D. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
- E. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- F. Vacuum and broom clean substrate to be covered immediately before installing carpet tile.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's written instructions.
- C. Maintain dye-lot integrity. Do not mix dye-lots in same area.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottom obstructions, removeable flanges, alcoves and similar openings.
- F. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- G. Fully adhere carpet tile to substrate.
- H. Trim carpet tile neatly at walls and around interruptions.
- I. Complete installation of edge strips, concealing exposed edges.
- J. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device

3.04 CLEANING

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive and other surface blemishes without damage, from floor, base, and wall surfaces.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Clean and vacuum carpet surfaces using commercial machine with face-beater element.
- B. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 6813

**SECTION 09 9123
INTERIOR PAINTING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints. Refer to project drawings for substrates defined throughout project. Project may include but is not limited to:
 - 1. Metal: Aluminum and galvanized.
 - 2. Galvanized Metal: Ceilings and ductwork.
 - 3. Hollow metal doors and Frames.
 - 4. Wood: Walls, ceilings, doors and trim.
 - 5. Gypsum Board: Walls, ceilings, and similar items.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - 1. Prime surfaces to receive wall coverings.
 - 2. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. Paint interior surfaces of air ducts and convectors and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - d. Paint dampers exposed behind louvers, grilles, and convectors and baseboard cabinets to match face panels.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
 - 6. Floors, unless specifically indicated.
 - 7. Ceramic and other tiles.
 - 8. Brick, architectural concrete, cast stone, integrally colored plaster, and stucco.
 - 9. Glass.
 - 10. Acoustical materials, unless specifically indicated.

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: For shop priming structural steel.
- B. Section 07 2119 - Spray-On Insulation.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.

- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.
- C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.
- D. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2024.
- E. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).
- F. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- G. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- H. SSPC-SP 2 - Hand Tool Cleaning; 2024.
- I. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.
- J. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct conference at the project site.
 - 1. Convene one month prior to commencing work of this section.
 - 2. Require attendance of installation material manufacturer, paint supplier, paint installer and installers of related work. Review installation procedures and coordination required with related work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Product characteristics.
 - 2. Surface preparation instructions and recommendations.
 - 3. Primer requirements and finish specification.
 - 4. Storage and handling requirements and recommendations.
 - 5. Application methods.
 - 6. Clean-Up information.
 - 7. Cross-reference to specified paint system products to be used in project; include description of each system.
- C. Samples: Submit two paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Paint and Finish Materials: 5 percent, but not less than 1 gal of each material and color applied, unless otherwise approved by owner. Paint to be from the same product run, unopened and labeled "For _____ use only".
3. Label each container with color and room locations in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with a minimum of 5 years experience.
 1. References and examples available upon request by owner/architect.

1.07 MOCK-UP

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 1. Vertical and Horizontal Surfaces: Provide samples of at least 100 square feet.
 2. Other Items: Architect will designate items or areas required.
- C. Final approval of color selections will be based on mockups.
 1. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
- D. Approval of mock-ups does not constitute approval of deviations from the contract documents contained in mock-ups unless Architect specifically approves such deviations in writing.
- E. Subject to compliance with requirements, approved mock-up may remain as part of the work if undisturbed at time of substantial completion.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Maintain containers in clean condition, free of foreign materials and residue.
- D. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's written instructions.

1.09 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.
- D. Apply paints only when the temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 degrees F.
- E. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Provide paints and finishes used in any individual system from the same manufacturer; unless otherwise specified.
- B. Subject to compliance with requirements, provide products that meet or exceed performance and physical characteristics of basis of design.
- C. Manufacturers:
 - 1. Benjamin Moore & Company: www.benjaminmoore.com/.
 - 2. PPG Paints: www.ppgpaints.com/.
 - 3. Diamond Vogel Paints: www.diamondvogel.com/.
 - 4. Rust-Oleum Corporation: www.rustoleum.com/.
 - 5. Valspar Corporation: www.valspar.com/.
 - 6. Scuffmaster; Product of Wolf-Gordon Inc.: www.scuffmaster.com/.
 - 7. Sherwin-Williams Company (Basis of Design): www.sherwin-williams.com/#sle.
- D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of paint.
- C. Volatile Organic Compound (VOC) Content: See Section 01 6116.
- D. Color and Finish Sheen:
 - 1. Color: As indicated on Drawings.
 - 2. Finish Sheen: As recommended per substrate listed.
 - a. Overhead ferrous metals, exposed structure and MEP: Flat with dryfall enamel.
 - b. Wood: Semi-gloss.
 - c. Gypsum board (walls): Eg-shel.
 - d. Gypsum board (ceilings): Flat.
 - 3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling under which they are mounted.

2.03 PAINT SYSTEMS - INTERIOR

- A. General:
 - 1. Refer to project drawings for colors, finishes, substrates defined throughout project. The following systems are utilizing Sherwin-Williams as the basis of design; substitutions subject to compliance with requirements, provide products that meet or exceed performance and physical characteristics of basis of design.
- B. Metal, Galvanized: Ceilings and ductwork.
 - 1. Dryfall Waterborne Topcoats:
 - a. Flat Finish:

- 1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-181 Series.
- C. Hollow Metal Doors and Frames: Single Component Pre-Catalyzed Waterbased Epoxy.
 1. Alkyd Systems, Water-Based.
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series .
- D. Wood: Walls, ceilings, doors, and trim.
 1. Alkyd Systems, Water-Based: LEED VOC only.
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Multi-Purpose Int./Ext. Primer/Sealer, B51-450.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series.
- E. Gypsum Board: Walls, ceilings, and similar items.
 1. Latex Systems:
 2. Eg-Shel Finish:
 - a. 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
 - 1) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series.
 3. Flat Finish:
 - a. 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
 - b. 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series.

2.04 TEXTURED COATING

- A. Primer for textured coating, latex, and flat: As recommended in writing by topcoat manufacturer.
- B. Intermediate coat for textured coating, latex, and flat: As recommended in writing by topcoat manufacturer.

2.05 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to project site, samples may be taken at project site. Samples will be identified, sealed, and certified by testing.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying paint materials from project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Do not begin application of paints and finishes until substrates have been adequately prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Fill bug holes, air pockets, and other voids with cement patching compound.
 - 3. Prepare surface as recommended by top coat manufacturer and in accordance with SSPC-SP 13/NACE No.6.
- H. Masonry:
 - 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
 - 2. Prepare surface as recommended by top coat manufacturer.
- I. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- J. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.
- K. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- L. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- M. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- N. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.

2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- O. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- P. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniformed paint finish, color, and appearance.
- F. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brushmarks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- H. Sand wood and metal surfaces lightly between coats to achieve required finish.
- I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- J. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 1. Paint the following work where exposed in equipment rooms:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Plastic conduit.
 - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, included panelboards.
 - b. Uninsulated metal piping. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Plastic conduit.
 - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

- g. Other items as directed by Architect.
- K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.05 PROTECTION

- A. Protect finishes until completion of project. Including work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 09 9123

SECTION 10 1416 PLAQUES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Plaques.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of plaque sign, indicating style, font, foreground and background colors, locations, and overall dimensions of each sign.
- C. Shop Drawings: Indicate dimensions, locations, elevations, materials, text and graphic layout, Fonts, and attachment details.
- D. Selection Samples: Where materials, colors, and finishes are not specified, submit two sets of color selection charts or chips.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
 - 1. Provide references and examples upon request of Architect and/or Owner.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package plaque signs as required to prevent damage before installation.
- B. Store under cover and elevated above grade.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Plaques:
 - 1. Takeform: www.takeform.net/#sle.
 - 2. A.R.K. Ramos Architectural Signage: www.arkramos.com
 - 3. Gemini, Inc.:
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PLAQUES

- A. Metal Plaques -Exterior Signage:
 - 1. Material: Aluminum casting.
 - 2. Material Thickness: 1 inch, minimum.
 - 3. Size: As indicated on drawings 36" Diameter.
 - 4. Text and Typeface:
 - a. Character Font: As Indicated on Drawings.
 - b. Character Case: As Indicated on Drawings.
 - 5. Border Style: As Indicated on Drawings.

6. Background Texture: As selected by Architect from manufacturer's standard background textures.
 7. Surface Finish: As selected by Architect from manufacturer's full range.
 8. Painted Background Color: As selected by Architect from manufacturer's standard background colors.
 9. Protective Coating: Manufacturer's standard clear coating.
 10. Mounting: Blind studs.
 11. Products:
 - a. A.R.K. Ramos; Cast Plaques: www.arkramos.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Metal Plaques -Dedication Plaque -Interior:
1. Material: Aluminum casting.
 2. Material Thickness: 1/2 Inch (12.7 mm), minimum.
 3. Size: 18 inches by 24 inches.
 4. Text and Typeface:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - b. Character Case: Upper case only.
 - c. Character Color: Contrast with background color.
 5. Border Style: As selected by Architect from manufacturer's standard borders.
 6. Background Texture: As selected by Architect from manufacturer's standard background textures.
 7. Surface Finish: As selected by Architect from manufacturer's full range.
 8. Painted Background Color: As selected by Architect from manufacturer's standard background colors.
 9. Protective Coating: Manufacturer's standard clear coating.
 10. Mounting: Blind studs.
 11. Products:
 - a. A.R.K. Ramos; Cast Plaques: www.arkramos.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Acrylic Plaques:
1. Material Thickness: 1/4 inch, minimum.
 2. Size: As Indicated on Drawings.
 3. Text and Typeface:
 - a. Character Font: As Indicated on Drawings.
 - b. Character Case: As Indicated on Drawings.
 - c. Character Color: Contrast with background color.
 4. Border Style: As Indicated on Drawings.
 5. Background Texture: Smooth.
 6. Mounting: Wall standoffs.
 - a. Standoff Diameter: 1 inch.

2.03 ACCESSORIES

- A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Locate plaque signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 1416

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SECTION 10 1419 DIMENSIONAL LETTER SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dimensional letter signage.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.
- D. Selection Samples: Where materials, colors, and finishes are not specified, submit two sets of selection charts or chips.
- E. Verification Samples: Submit samples showing colors and finishes specified.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Package dimensional letter signs as required to prevent damage before installation.
- B. Store under cover and elevated above grade.
- C. Store tape adhesive at a normal room temperature of 68 to 72 degrees F.

1.05 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Dimensional Letter Signs:
 - 1. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
 - 2. Inpro Corporation: www.inprocorp.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DIMENSIONAL LETTERS

- A. Metal Letters:
 - 1. Material: Aluminum sheet, fabricated reverse channel.
 - 2. Thickness: Manufacturer's standard for letter size.
 - 3. Letter Height: As indicated on drawings.
 - 4. Text and Typeface:
 - a. Character Font: Bahnschrift Condensed .
 - 5. Finish: Brushed, satin.
 - 6. Color: As selected.
 - 7. Mounting: Projected mount with collars.

2.03 ACCESSORIES

- A. Concealed Screws: Noncorroding metal; stainless steel.
- B. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION 10 1419

**SECTION 10 1423
PANEL SIGNAGE****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Panel signage.

1.02 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
- D. Samples: Submit one sample of each type of sign, of size similar to that required for project, indicating sign style, font, and method of attachment. Provide physical color sample charts or chips of manufacturer's full range for color selection.
- E. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- F. Manufacturer's qualification statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
 - 1. Provide references and examples upon request of Architect and/or Owner.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store under cover and elevated above grade.
- D. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain minimum ambient temperature during and after installation.

1.07 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or delamination of sheet materials and components.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Panel Signage:
 - 1. Best Sign Systems, Inc: www.bestsigns.com/#sle.
 - 2. Inpro Corporation: www.inprocorp.com/#sle.
 - 3. Takeform: www.takeform.net/#sle.
 - 4. 2/90 Sign Systems: www.290signs.com/#sle.
 - 5. ASI Sign Systems: www.asisignage.com/#sle.
 - 6. Rowmark: www.rowmark.com/#sle.
 - 7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 REGULATORY REQUIREMENTS

- A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.03 PANEL SIGNAGE

- A. Panel Signage:
 - 1. Application: Room and door signs.
 - 2. Description: Flat signs with engraved panel media, tactile characters.
 - 3. Sign Size: As indicated on Drawings.
 - 4. Total Thickness: Manufacturer's standard for size of signs indicated on Drawings.
 - 5. Sign Edges: As indicated on Drawings.
 - 6. Corners: As indicated on Drawings.
 - 7. Color and Font, unless otherwise indicated:
 - a. Character Font: As indicated on Drawings.
 - b. Character Case: Upper case only.
 - c. Background Color: As selected by Architect from full range of color.
 - d. Character Color: Contrasting color selected by Architect from full range of color.
 - 8. Material: Laminated colored plastic engraved through face to expose core as background color.
 - 9. Profile: As indicated on Drawings.
 - 10. Tactile Letters: Raised 1/32 inch minimum.
 - 11. Braille: Grade II, ADA-compliant.
 - 12. One-Sided Wall Mounting: Tape adhesive.

2.04 SIGNAGE APPLICATIONS

- A. Room and Door Signs:
 - 1. As indicated on Drawings.

2.05 ACCESSORIES

- A. Tape Adhesive: Double-sided tape, Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick.

2.06 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Preassemble signs in the shop to the greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

2.07 GENERAL FINISH REQUIREMENTS

- A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
- B. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- C. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install signs level, plumb, true to line, with sign surfaces free of distortion and other defects in appearance.
- C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and administrative authority having jurisdiction.
- D. Install signs so they do not protrude or obstruct according to the accessibility standard.
- E. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

3.03 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 1423

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SECTION 10 2113.19 PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic toilet compartments.
- B. Urinal screens.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking and supports.
- B. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- C. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings, location of cutouts for compartment-mounted toilet accessories, show locations of centerlines of toilet fixtures, show locations for floor drains, show ceiling mounted items with ceiling grid, and overhead support or bracing locations.
- D. Samples: Submit two samples of partition panels, 6 by 6 inch in size illustrating panel finish, color, and sheen. Also include each type of hardware and accessory.
- E. Manufacturer's Instructions: Indicate special procedures and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Tested in accordance with NFPA 286, testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 0-25.
 - 2. Smoke-Development Index: 450 or less.
 - 3. Selection of colors need to meet NFPA 286 , regardless of upcharge.
- B. Regulatory Requirements: Comply with Applicable provisions in ICC A117.1 for toilet compartments designated as accessible.

2.02 MANUFACTURERS

- A. Solid Plastic Toilet Compartments: Subject to compliance with requirements, provide products by one of the following:

1. All American Metal Corp - AAMCO: www.allamericanmetal.com/#sle.
2. American Sanitary Partition Corporation: www.am-sanitary-partition.com/.
3. ASI Accurate Partitions: www.asi-accuratepartitions.com/#sle.
4. ASI Global Partitions (Basis of Design): www.asi-globalpartitions.com/#sle.
5. Bradley Corporations: www.bradleycorp.com/.
6. General Partitions Mfg. Corp. : www.generalpartitions.com/.
7. Hadrian: www.hadrian-inc.com/#sle.
8. Scranton Products: www.scrantonproducts.com/#sle.

2.03 SOLID PLASTIC TOILET COMPARTMENTS

- A. General Description: Factory-fabricated doors, pilasters, and divider panels made of solid, molded, high-density polyethylene (HDPE); floor-mounted, headrail-braced.
- B. Color: As indicated on Drawings.
- C. Doors:
 1. Thickness: 1 inch.
 2. Width: 24 inches.
 3. Width for Handicapped Use: 36 inches, outswinging.
 4. Height: 55 inches.
- D. Panels:
 1. Thickness: 1 inch.
 2. Height: 82 inches.
- E. Pilasters:
 1. Thickness: 1 inch.
 2. Width: As required to fit space; minimum 3 inches.
- F. Urinal Screens: Without doors; to match compartments; mounted to wall with continuous panel bracket.

2.04 ACCESSORIES

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
- B. Brackets (Fittings):
 1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.
- C. Headrails: Extruded aluminum, anti-grip profile.
 1. Size: Manufacturer's standard size.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper-proof type.
 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
 2. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.
- E. Hinges: Stainless steel, manufacturer's standard finish.
 1. Continuous- cam type hinge, self closing. Allow emergency access by lifting door.
- F. Door Hardware: Stainless steel, manufacturer's standard finish. Designated to resist damage due to slamming.
 1. Door Latch: Slide type with exterior emergency access feature.
 2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.
 3. Provide door pull for outswinging doors to comply with regulatory requirements for accessibility.

4. Provide outswing doors with second door pull and door stop at compartments designated as accessible.
- G. Coat Hook: One per compartment, mounted on door. Manufacturer's heavy-duty, rubber-tipped, cast-stainless steel bumper.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
- B. Verify dimensions, tolerances, and interfaces with other work.
- C. Verify spacing of and between plumbing fixtures.
- D. Verify location of built-in framing, anchorage, and bracing.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, straight and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and 3/8 inch to 1/2 inch between panels and pilasters.
- C. Attach panel stirrup brackets securely to walls and pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel.
 1. Locate wall brackets, so holes for wall anchors occur in masonry or tile joints
 2. Align brackets at pilasters with brackets at walls.
- D. Attach panels and pilasters to brackets. Locate headrail joints at pilaster center lines.
- E. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hand doors to align tops of doors with top of panels and adjust, so tops of doors are parallel with overhead brace when doors are in closed position.
- F. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.
- G. Replace damaged or scratched materials with new materials. Do not touch up scratches or damaged finish in field.

3.03 ADJUSTING

- A. Adjust, lubricate and align hardware to uniform clearance at vertical edge of doors according to hardware manufacturer's written instructions for proper operation.
- B. Adjust hinges on in-swing doors to position in approximately 30 degrees from closed position when unlatched. Return out-swinging doors to closed position.

3.04 CLEANING

- A. Clean partitions and hardware.
- B. Remove any protective film.

END OF SECTION 10 2113.19

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SECTION 10 2600
WALL AND DOOR PROTECTION

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Corner guards.
- B. Protective wall covering.
- C. Protective wall panel system.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Corner guards fabricated from rolled metal sections or bent plate.
- B. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.
- C. Section 09 2116 - Gypsum Board Assemblies: Placement of supports in stud wall construction.
- D. Section 09 2216 - Non-Structural Metal Framing: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.
- C. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2021.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.
- F. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, rough-in measurements, construction details, material description, impact strength, and finishes.
- C. Shop Drawings: Include plans, elevations, sections, and attachment and trim details.
- D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
 - 1. Submit two sections of each type and color of corner guards, 24 inches long.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Stock Materials: Minimum, one full size of each kind of corner guard used in project.

- G. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
- B. Protect work from moisture damage.
- C. Protect work from UV light damage.
- D. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
- E. Store products in either horizontal or vertical position, in compliance with manufacturer's written instructions.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty for corner guards. Complete forms in Owner's name and register with manufacturer.
- C. Installer Warranty: Provide 5-year warranty for corner guards commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Corner Guards:
 - 1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Protective Wall Covering:
 - 1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- C. Protective Wall Panel System:
 - 1. Construction Specialties, Inc: www.c-sgroup.com/#sle..
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE CRITERIA

- A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.
- B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.
- C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.03 PRODUCT TYPES

- A. Corner Guards - Surface Mounted:
 - 1. Corner guards fabricated from rolled section or bent plate are specified in Section 05 5000.

2. Material: Type 304 stainless steel, No. 4 finish, 16 gauge thick.
 3. Thickness: 0.075 inch.
 4. Performance: Resist lateral impact force per manufacturer's standard at any point without damage of permanent set.
 5. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 6. Width of Wings: 2 inches.
 7. Corner: 90 degrees typical, see Drawings for unique conditions.
 8. Color: As indicated on Drawings.
 9. Length: One piece; see Drawings.
 10. Mounting: Countersunk screws through factory-drilled holes.
 11. Preformed end caps.
- B. Protective Wall Covering:
1. Material: High-impact acrylic-modified vinyl.
 2. Thickness: 0.040 inch.
 3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 4. Color: As indicated on Drawings.
 5. Accessories: Provide manufacturer's standard color-matched trim and moldings.
 6. Mounting: Adhesive.
- C. Protective Wall Panel System:
1. Panel Material: High-impact acrylic-modified vinyl.
 2. Wainscot and Wall Base Trim Material: High-impact acrylic-modified vinyl formed over shaped 3/4" medium density fiber board.
 3. Panel Thickness: 0.060 inch.
 4. Panel Size: 4 feet by 10 feet.
 5. Trim Material Height: 4".
 6. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 55 or less, when tested in accordance with ASTM E84.
 7. Color and Pattern: As indicated on Drawings.
 8. Texture: As indicated on Drawings.
 - a. Texture Direction: Vertical.
 9. Accessories: Provide manufacturer's standard color-matched trim and moldings.
 - a. Wall Base: SFR-WB; 4" Height, 1/2" Thick.
 - b. Notched Wainscot Trim: SFR-WR; 4" Height, 1/2" Thick.
 - c. Inside Corner Trim: SFR-IVC; 2" Wing, 3/8" Thick.
 - d. Outside Corner Trim: SFR-OVC; 2" Wing, 3/8" Thick..
 10. Mounting: Adhesive.
- D. Adhesives and Primers: As recommended by manufacturer.
- E. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

2.04 FABRICATION

- A. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.
- B. Pre-drill holes for attachment.

2.05 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify that field measurements are as indicated on drawings.
- C. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of the Work.
- D. For wall protection attached with adhesive, verify compatibility with the suitability of substrates, including compatibility with existing finishes or primers, and for adhered items are clean and smooth.
 - 1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.
- E. Start of installation constitutes acceptance of project conditions.

3.02 PREPARATION

- A. Complete finishing operations, including painting, before installing wall and door protection.
- B. Before installation, clean substrate to remove dust, debris, loose particles, oils, grease, and dirt.

3.03 INSTALLATION

- A. Install components in accordance with manufacturer's written instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Position corner guard 4 inches above finished floor typical unless noted otherwise on drawings.
- C. Position protective wall covering no less than 1 inch above finished floor to allow for floor level variation.
 - 1. Wainscot Installation: Establish a level line at the specified height for entire length of run. Install by aligning top of edge of covering with this line.
 - 2. Apply adhesive with 1/8 inch V-notch trowel to an area of wall surface that can be completed within cure time of the adhesive.
 - 3. Install trim pieces as required for a complete installation. Allow tolerance for thermal movement.
 - 4. At inside and outside corners cut covering sheets to facilitate installation of trim pieces or corner guards.

3.04 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

3.05 CLEANING

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.
 - 1. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 10 2600

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SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Commercial toilet accessories.
- B. Changing stations.
- C. Utility room accessories.

1.02 RELATED REQUIREMENTS

- A. Section 09 3000 - Tiling: Ceramic washroom accessories.
- B. Section 10 2113.19 - Plastic Toilet Compartments.
- C. Division 22 - Plumbing Fixtures.

1.03 ABBREVIATIONS AND ACRONYMS

- A. PETG: Polyethylene Terephthalate Glycol.

1.04 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- D. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2025.
- E. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2025b.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
- G. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- H. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.
- I. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).
- J. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- K. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- L. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.
- M. ASTM D4802 - Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet; 2016 (Reapproved 2024).
- N. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- O. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

- P. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.
- B. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- C. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.
- D. Coordinate accessories with electrical engineer as needed.

1.06 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
- C. Samples: Submit one full-sized sample(s) of each accessory, illustrating color and finish, upon request.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
- B. Keys: Provide 2 keys for each applicable accessory to Owner; master key lockable accessories.
- C. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

2.02 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Back paint components where contact is made with building finishes to prevent electrolysis.

2.03 COMMERCIAL TOILET ACCESSORIES

- A. Toilet Paper Dispenser (TPD) : Owner-furnished, Vendor-installed.
- B. Paper Towel Dispenser (PTD) : Owner-furnished, Vendor-installed.
- C. Soap Dispenser (SD): Owner-furnished, Vendor-installed.
- D. Mirrors (MIR): Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
 - 1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 - 2. Size: As indicated on Drawings.
 - 3. Frame: 0.05 inch angle shapes, with mitered , welded and ground corners, and tamperproof hanging system; satin finish.
 - 4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.

5. Products:
 - a. Bradley Corporation; 7B1: www.bradleycorp.com/
 - b. Substitutions: Section 01 6000 - Product Requirements.
- E. Grab Bars (GB): Stainless steel, peened surface.
 1. Standard Duty Grab Bars:
 - a. Push and Pull Point Load: Minimum 250 lbf.
 - b. Dimensions: 1-1/2 inch outside diameter, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Finish: Smooth, ASTM A480/A480M No. 4 finish Satin on ends and slip-resistant texture in grip area.
 - d. Length and Configuration: As indicated on Drawings.
 - e. Frame: Stainless steel channel with concealed mounting.
 - f. Products:
 - 1) Bradley Corporation.; Model 812 : www.bradleycorp.com/
 - 2) Substitutions: Section 01 6000 - Product Requirements.
- F. Sanitary Napkin Disposal Unit (SND): Owner-furnished, Vendor-installed.
- G. Hook: Heavy-duty stainless steel, double-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
 1. Products:
 - a. Bradley Corporation.; Model 9124: www.bradleycorp.com/
 - b. Substitutions: Section 01 6000-Product Requirements.

2.04 CHANGING STATIONS

- A. Baby Changing Station(BCS) : Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 1. Material: Stainless steel.
 2. Mounting: Surface; horizontal.
 3. Color: Selected by Architect from full range..
 4. Minimum Rated Load: 250 pounds.
 5. Products:
 - a. Koala Kare; Model KB310-SSWM : <https://www.koalabear.com/>
 - b. Substitutions: 01 6000 - Product Requirements.

2.05 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
 1. Drying rod: Stainless steel, 1/4 inch diameter.
 2. Hooks: Two, 0.06 inch stainless steel rag hooks at shelf front.
 3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
 4. Length: 30 inches.
 5. Products:
 - a. American Specialties, Inc; 1315-3: www.americanspecialties.com/#sle.
 - b. Substitutions: 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.

- C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' written instructions in locations indicated on drawings, using fasteners appropriate to substrate indicated and recommended by unit manufacturer.
- B. Install plumb and level, securely and rigidly anchored to substrate in locations and at heights indicated.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION, ADJUST

- A. Protect installed accessories from damage due to subsequent construction operations.
- B. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- C. Remove temporary labels and protective coatings.
- D. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 10 2800

**SECTION 10 2814
ELECTRIC HAND DRYERS**

PART 1 GENERAL**1.01 CONDITIONS AND REQUIREMENTS**

- A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

1.02 SECTION INCLUDES

- A. Electric hand dryers.

1.03 RELATED SECTIONS

- A. Division 26 - Electrical: Electrical systems and components.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 3300.
- B. Product Data: Provide construction details, dimensions, anchoring and mounting requirements, material and finish descriptions, electrical requirements, and manufacturer's warranty.
- C. Operation and Maintenance Data: Provide for electric hand dryers to include in maintenance manuals.
- D. Warranty: Provide sample of manufacturer's standard warranty for parts and labor.

1.05 QUALITY ASSURANCE

- A. Product Certification: ETL listed in accordance with UL 507. National Sanitation Foundation (NSF) Protocol P335 "Hygienic Commercial Hand Dryers" compliant.
- B. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle electric hand dryers in manufacturer's protective packaging.
- B. Store electric hand dryers off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

1.07 COORDINATION

- A. Coordinate locations of electric hand dryers with other work to prevent interference with clearances required for access, and for proper installation, adjustment, operation, cleaning, and servicing of electric hand dryers.

1.08 WARRANTY

- A. Manufacturer's Standard Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective electric hand dryer components and labor within specified warranty period.
 - 1. Warranty Period: Five (5) years limited for labor and five (5) years for parts.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the electric Bradley Aerix hand dryers manufactured by Bradley Corporation, www.bradleycorp.com, or comparable product acceptable to the Architect.
- B. Substitutions will be considered under provisions of Section 01 25 00.

2.02 ELECTRIC HAND DRYERS

- A. Electric Hand Dryers: Bradley Aerix Hand Dryer, Model 2902-2874.
 - 1. Mounting: Surface mounted on aluminum baseplate; protrudes four inches from wall, no recessing required; ADA compliant.
 - 2. Construction: Stainless steel cover with satin finish.
 - 3. Color Finish: Satin.
 - 4. Operation: Touch-free capacitive sensor activation.
 - a. Hand dry time: 12-15 seconds.
 - b. Airspeed at nozzle: 4,920-9,840 LFM
 - c. Operating Airflow: 36-58 CFM.
 - d. Rated Operating Noise Power: 64-70 db(A).
 - 5. Motor: Universal-type with high-speed, universal brush, fully adjustable (3,800–8,200 RPM) potentiometer, Class A; Aluminium centrifugal double asymmetrical inlet fan wheel; aluminum scroll fan and safety thermal cut-off.
 - 6. Electrical Requirements: 100-120 V, 208 V, 220-240 V, Bradley recommends a dedicated circuit with GFCI protection.
 - 7. Operating Temperature Range: 0 - 40 degrees C.
 - 8. Standby Power Consumption: Less than 0.5 W.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify availability and characteristics of electrical power. Drill minimum two (2) inch diameter holes for electrical service entrance through backplate.
- B. Do not begin installation until substrates are complete and ready for installation of electric hand dryers.

3.02 INSTALLATION

- A. Locate and install mounting bracket in accordance with manufacturer's written instructions. Use minimum 0.25-inch anchors to mount bracket. Mount electric hand dryer at height above finished floor recommended by manufacturer.
- B. Install electric hand dryer in accordance with manufacturer's written instructions, using fasteners appropriate to substrate indicated and recommended by manufacturer. Install electric hand dryers level, plumb, and firmly anchored in locations and at heights indicated.

3.03 CLEANING AND PROTECTION

- A. Adjust electric hand dryers for smooth operation. Replace damaged or defective components.
- B. Remove protective coverings from finished surfaces.
- C. Clean exposed surfaces using materials and methods recommended by manufacturer.

END OF SECTION 10 2814

**SECTION 10 4400
FIRE PROTECTION SPECIALTIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking.

1.03 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- B. FM (AG) - FM Approval Guide; Current Edition.
- C. NFPA 10 - Standard for Portable Fire Extinguishers; 2026.
- D. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide extinguisher operational features.
- C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
- D. Manufacturer's Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Operation and Maintenance Data: Include test, refill, or recharge schedules and recertification requirements.

1.05 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature causes freezing of extinguisher ingredients.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Fire Extinguishers:
 - 1. Activar Construction Products Group, Inc. - JL Industries; Cosmic Extinguisher - Multipurpose Chemical: www.activarcpg.com/#sle.
 - 2. Ansul, a Tyco Business; Cleanguard: www.ansul.com/#sle.
 - 3. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
 - 4. Oval Brand Fire Products; Oval Dry Chemical Fire Extinguisher - Multipurpose ABC: www.ovalfireproducts.com/#sle.
 - 5. Potter-Roemer: www.potterroemer.com/#sle.
 - 6. Larsens Manufacturing Company.
 - 7. Guardian Fire Equipment, Inc.
 - 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. Activar Construction Products Group, Inc. - JL Industries; Ambassador Series: www.activarcpg.com/#sle.
 - 2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
 - 3. Larsen's Manufacturing Co: www.larsensmfg.com/#sle.

4. Oval Brand Fire Products; Cabinets for Low Profile Extinguishers:
www.ovalfireproducts.com/#sle.
5. Potter-Roemer: www.potterroemer.com/#sle.
6. Babcock-Davis.
7. Guardian Fire Equipment, Inc.
8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. General Requirements: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated on drawings.
- B. Multipurpose Dry-Chemical-Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
 1. Stored Pressure Operated: Deep drawn.
 2. Class: A:B:C.
 3. Size: 5 pound.
 4. Size and classification as scheduled on drawings.
 5. Finish: Baked polyester powder coat, color as selected.
 6. Temperature range: Minus 65 degrees F to 120 degrees F.
- C. Wet-Chemical-Type Fire Extinguishers: Stainless steel tank, with pressure gauge.
 1. Class: K.
 2. Size and classification as scheduled on drawings.
 3. Finish: Polished stainless steel.
 4. Temperature Range: Minus 20 to 120 degrees F.

2.03 FIRE EXTINGUISHER CABINETS

- A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire-resistance rating of walls where cabinet installed.
- B. Cabinet Construction: Non-fire rated.
 1. Formed primed steel sheet; 20-gauge, 0.036-inch thick base metal.
- C. Fire-Rated Cabinet Construction: One-hour fire rated.
 1. Steel; double wall or outer and inner boxes with 5/8-inch thick fire barrier material.
- D. Cabinet Configuration: Semi-recessed type.
 1. Size to accommodate accessories.
 2. Trimless type.
- E. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with continuous piano hinge.
- F. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, flat shape, and set in resilient channel glazing gasket.
- G. Cabinet Mounting Hardware: Appropriate to cabinet, with predrilled holes for placement of anchors.
- H. Fabrication: Weld, fill, and grind components smooth.
- I. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.
- J. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

- A. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
- B. Extinguisher Brackets: Formed steel, galvanized and enamel finished.
- C. Extinguisher Theft Alarm: Battery-operated alarm, 10-second delay for disarming, activated by opening cabinet door.
- D. Graphic Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect. .
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - 2. Identify fire extinguisher cabinet with the words "FIRE EXTINGUISHER" applied to cabinet door.
 - a. Orientation: Vertical
- E. Lettering: "FIRE EXTINGUISHER" decal, or vinyl self-adhering, prespaced lettering in accordance with authorities having jurisdiction (AHJ).

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and interfaces with other work.
- B. Verify substrate and site conditions for product installation are in accordance with manufacturer's written instructions.
- C. Verify rough openings for cabinet are sized and located in accordance with manufacturer's written instructions.
- D. Notify Architect in writing of conditions detrimental to completion of work. Do not proceed with installation until detrimental conditions are corrected.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure rigidly in place.
- C. Place extinguishers and accessories in cabinets and on wall brackets.

3.03 MAINTENANCE

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Provide separate maintenance contract for specified maintenance service.

END OF SECTION 10 4400

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SECTION 10 5126 PLASTIC LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic lockers.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete base construction.

1.03 REFERENCE STANDARDS

- A. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan and combination lock code.
- D. Samples: Submit two samples 3 by 6 inches in size, of each color scheduled.
- E. Manufacturer's Installation Instructions: Indicate component installation assembly.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solid Plastic Lockers:
 - 1. ASI Storage Solutions (Basis of Design): www.asi-storage.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SOLID PLASTIC LOCKERS

- A. Lockers: Factory assembled, made of solid plastic panels, tested in accordance with NFPA 286, homogenous color throughout.
 - 1. Doors: Full overlay without frame.
 - 2. Door Color: As indicated on Drawings.
 - 3. Body Color: Manufacturer's standard white or light color.
- B. Component Thicknesses:
 - 1. Doors: 1/2 inch minimum thickness.
 - 2. Locker Body: Tops, bottoms, backs, and shelves 3/8 inch minimum.
- C. Hinges: Full height of locker, manufacturer's standard heavy duty type.
- D. Coat Hooks: High impact plastic.
- E. Locks: Locker manufacturer's standard type indicated above.
- F. Locker Base: Solid plastic base, 4 inches high, field assembled.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared bases are in correct position and configuration.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Place and secure on prepared base.
- C. Install lockers plumb and square.
- D. Install end panels and filler panels.
- E. Install fittings if not factory installed.
- F. Replace components that do not operate smoothly.

END OF SECTION 10 5126

SECTION 1140 00 - FOODSERVICE EQUIPMENT**PART 1 GENERAL****1.01 SCOPE OF WORK**

- A. The Foodservice Equipment Contractor (FSEC) shall provide the labor, equipment, and materials specified in this Section in a timely manner consistent with the construction schedule. The FSEC shall procure, fabricate, store, deliver, unload, uncrate, assemble, set-in-place, level, and ready equipment for utility connections.
1. The work in this Section shall be under a separate sub-contract or a prime contract by a single qualified FSEC who shall report to the Prime Contractor and/or Owner's Representative and coordinate with other subcontractors for this project.
 2. The FSEC shall submit written notification of any manufacturer or construction-related issues that are causing a delay in the equipment delivery and/or installation.
 3. All specified equipment shall be installed according to the Manufacturer's written instructions, original design, and applicable codes. The FSEC shall remove all installation debris and protective coverings from all finished surfaces. Wash, clean and polish all equipment, glass, plastic, hardware, accessories, fixtures, and fittings prior to the inspection and acceptance of the work for this section. Remove all factory applied film and adhesive residue before start-up.
 4. The FSEC shall provide a Project Manager as the primary point of contact to the Prime Contractor, Architect, and Owner's Representative for coordination and responding to questions pertaining to the foodservice equipment Scope of Work.
 5. Tests, permits, and inspections required by the authorized having jurisdiction (AHJs) and directly related to the construction and installation of the specified foodservice equipment shall be secured and paid for by the FSEC unless otherwise specified in this Section.
 6. The FSEC shall provide start-ups and demonstrations for all new Fabricated Equipment and serialized equipment specified in this Section.
 7. The FSEC shall provide warranties for all new foodservice equipment specified in this Section.
 8. The FSEC shall perform all operations in connection with the execution of the Work as represented in the plans and specifications including that which is reasonably inferred. The foodservice equipment bid drawings and specifications complement each other. Therefore, neither is complete without the other.
 9. The FSEC shall request written clarification when the drawings and specifications contain conflicting requirements. The FSEC shall provide the better quality or greater quantity of work or material. Costs incurred by failure to clarify conflicting requirements are the responsibility of the FSEC.
 - a. Where model numbers, quantities, sizes, or gauges of material differ on plans and specifications, it shall be understood that the FSEC shall figure the larger quantities, larger size, and/or heavier gauge unless advised otherwise in writing.
 - b. Where an item, accessory, or option is required for a piece of equipment that is shown on the plans or elevations it shall be deemed to be provided by the FSEC even if it is not listed in the item specifications.
 - c. Where all or part of an item, accessory, or option is referred to in the singular number, it is intended that such reference shall apply to as many such items, accessories, or options as necessary to complete the installation.
 10. The Owner reserves the right to accept the manufacturer's replacement or equipment from a manufacturer specified as equal when equipment specified is no longer available. The Owner reserves the right to reject equipment when a specified manufacturer is sold, when sale is pending, when filing for Chapter 7 or 11 status, and receive equipment from a specified equal manufacturer.
- B. Related Scopes of Work included in this Section:
1. The general conditions and all applicable supplementary conditions including drawings, specifications, addendums, instruction to bidders, Division 00, and Division 01 shall apply to the Foodservice Equipment Contractor in providing all items, equipment, submittals, materials, transportation, installation, operation is, along with methods listed, mentioned, referenced, or reasonably inferred to the work in this Section.
 2. The FSEC shall coordinate and verify all items provided in this Section with all drawings, specifications, manufacturer's requirements, actual site conditions, building elements, and other equipment to ensure that there are no discrepancies or conflicts. This shall include but not limited to verification of quantities, dimensions, clearances, direction of operation, door swings, utilities, fabrication details, and required methods of installation for the Prime Contractor, Owner's Representative, and Subcontractors.

3. The FSEC shall coordinate mechanical and electrical rough-in services, manufactured equipment and fabricated equipment construction, ceiling heights, recessed floors, sleeves, wall openings, refrigeration lines, service access, existing building conditions that affect equipment, and all other building conditions required to accommodate the specified equipment including new, existing, Owner furnished and future equipment with other trades. Cut holes in equipment to accommodate pipes, drains, electrical conduit and outlets as required.
 4. The FSEC shall coordinate temporary building openings required for equipment too large to be moved through the permanent building openings.
 5. The FSEC shall coordinate existing/relocated, Owner furnished, and other Vendor furnished foodservice equipment as specified in this Section.
 6. The FSEC shall provide necessary filler and trim panels and seal all vertical and horizontal edges of equipment adjacent to walls, ceilings and/or adjacent other equipment. All sealants shall be NSF and FDA approved for the application and shall not exceed a 3/8" bead width.
 7. The foodservice equipment Bid Drawings shall not be used as construction documents or shop drawings. The foodservice equipment Bid Drawings and specifications complement each other. Therefore, neither is complete without the other. The bid drawings are for reference, assistance, and guidance only. The drawings indicated the preferred final location of equipment. The exact final location will be dictated by the building conditions.
 8. The FSEC shall provide a licensed Refrigeration Contractor to install the specified remote refrigeration systems. Provide all refrigeration piping, valves, racks, insulation, pipe racking, refrigerants, and other required accessories (excluding curbs which shall be furnished by the Prime Contractor) to provide functional remote refrigeration system(s).
 - a. The FSEC shall coordinate the sizes and locations of wall penetrations and sleeves with the Prime Contractor or Owner's Representative.
 - b. FSEC shall coordinate the sizes and locations of the roof top compressor curbs, roof rails, and pitch pockets required for the roof top walk-in compressors specified in this Section with the Prime Contractor or Owner's Representative.
- C. Related Scopes of Work Excluded from this Section:
1. Division 22 – Plumbing: Refer to Division 22 for applicable requirements regarding the materials, plumbing and mechanical services required to complete the foodservice equipment installation, including but not limited to:
 - a. Provide all plumbing rough-ins per the Foodservice Equipment Plumbing Rough-in Plans, and notify FC Design, the Architect, and the Plumbing Engineer of any code issues you find.
 - b. Provide the required devices specified in Division 22, such as pipes, fittings, valves, backflow prevention devices, p-traps, tailpieces, atmospheric vents, air-gap assemblies, shock-arrestors, floor drains, floor sinks, and clean-outs required for the installation of the foodservice equipment, unless otherwise specified in this Section.
 - c. Provide gas supply piping, extensions, manifolds, regulators, and valves required to complete the foodservice equipment installation including final connections.
 - d. Provide softened hot and/or cold water meeting the operational requirements of the specified warewashing machine(s).
 - e. Install the FSEC furnished plumbing fixtures including faucets, disposers, overhead sprayers, hose reels, lever/modular waste drains, floor troughs, water filter systems, mechanical or electronic gas valves, gas regulators, flexible gas lines, and quick disconnects.
 - f. Extend the utilities from rough-in locations to final connection points on the equipment and interconnections between equipment and remote components. Provide required fittings, such as tee fittings, as needed. Purge all water supply lines prior to any foodservice equipment connections.
 - g. Extend indirect waste piping from the specified foodservice equipment to an appropriate indirect waste fixture as shown on the Foodservice Equipment Plumbing Rough-in plans.
 - h. Provide all grease trap(s)/interceptor(s), including permits and fee(s) required for the foodservice equipment installation, unless otherwise specified in this Section.
 - i. Disconnect the utilities of the existing foodservice equipment that is relocated or removed.
 - j. Verify the utility requirements of all Owner and Other Vendor furnished foodservice equipment with the Architect and/or Owner's Representative.
 2. Division 23 – Mechanical: Refer to Division 23 for the requirements regarding materials and ventilation services to complete the foodservice installation including but not limited to:

- a. FSEC to provide the kitchen ventilation hood(s), including condensate hood(s), required for the foodservice equipment installation. Provide and install all stainless-steel wall panels and components located below the hoods as required per code.
 - b. FSEC to provide the kitchen exhaust hood fire protect system(s), including testing and certification, required for the foodservice equipment installation.
 - c. Div. 23 to provide the exhaust fan(s) required for the foodservice equipment installation.
 - d. Div. 23 to provide the supply fan(s) required for the foodservice equipment installation.
 - e. FSEC to provide the ventilation system controls, including VFDs if required.
 - f. Provide the start-up, testing, balancing, and certification of the systems required for the foodservice equipment installation.
 - g. Provide all ductwork connecting the kitchen exhaust hood(s), including the condensate hood(s), to the corresponding exhaust and supply fans. Include duct insulation as required per code.
 - h. Disconnect the utilities of the existing foodservice equipment that is relocated or removed.
 - i. Verify the utility requirements of all Owner and Other Vendor furnished foodservice equipment with the Architect and/or Owner's Representative.
3. Division 26 – Electrical: Refer to Division 26 for the requirements regarding materials and electrical services to complete the foodservice installation including but not limited to:
 - a. Provide all electrical rough-ins per the Foodservice Equipment Electrical Rough-in Plans, and notify FC Design, the Architect, and the Plumbing Engineer of any code issues you find.
 - b. Provide electrical service panels, conduits, rough-ins, wiring, disconnect switches, outlets, switches, remote controls required for the foodservice equipment installation.
 - c. Provide interconnections and final connections for the specified foodservice equipment to the Building Management System (BMS), data systems, and alarm systems required to complete the installation of the remote refrigeration systems.
 - d. Provide wiring, electrical relays and/or shunt-trip breakers to be interconnected with the fire suppression system(s) to shut-off all electrical power to the cooking equipment and electrical outlets located below the kitchen exhaust hood(s).
 - e. Extend utilities from rough-in locations to final connection points on the equipment and interconnections to remote components, such as FSEC furnished control panels, and required devices specified in Division 26, such as electrical disconnects, unless otherwise specified in this Section.
 - f. Disconnect the utilities of the existing foodservice equipment that is relocated or removed.
 - g. Verify the utility requirements of all Owner and Other Vendor furnished foodservice equipment with the Architect and/or Owner's Representative.
4. Refer to the general construction documents, for applicable provisions regarding building works to complete the foodservice installation, including but not limited to:
 - a. The coordination and installation of foodservice equipment adjacent walls, floors and roof openings, sleeves, penetrations, and openings. Walk-in cooler/ freezer sub-floors, insulated floors and/or depressed slabs, waring slabs. Provide floor leveling grout and filler grout as required for the installation of the walk-in cooler/freezer.
 - b. Provide roof curbs, roof rails, and pitch pockets for the FSEC furnished remote refrigeration system compressors specified in this Section.
 - c. All cast-in-place concrete floors, exterior concrete footings and pads, insulated roof curbs and/or railings related to foodservice equipment, roof-top equipment stands, supports and pitch pockets. All finished walls, floors, and ceilings along with the installation of base curb framing, in filling and concrete capping of floor base curbs, risers, piping and soda line chases and building fire separation, enclosures, and wrapping piping. The Prime Contractor shall seal all openings in accordance with all federal, state, and local fire protection building and construction codes.

1.02 DEFINITIONS

- A. FSEC: Foodservice Equipment Contractor. The company, organization and person(s) specifically contracted, and responsible for the Section 11 4000 Scope of Work. References to other Contractors and Divisions will be specific.
- B. Furnish: Limited to the coordination, shipping, and delivery. Includes the materials/equipment itself.
- C. Install: Remove packaging, assemble, set-in-place, level, and make the equipment ready for utility connections. Final connections shall be provided by the corresponding utility contractors [Reference 1.01 Subpart C]. Reset, anchor and/or seal items and accessories to adjacent surfaces, adjust, calibrate, and test, after all the final utility connections and interconnections have been made.
- D. Provide: Furnish and install complete, adjusted, and ready for intended use. A combination of Furnish and Install.
- E. Equal: Comparable in size and critical dimensions, capacity, features, options & Accessories, finishes, operation and require similar utility services. If equal items are submitted the FSEC shall pay all costs required to modify the work of any trade affected.
- F. Buy-Out Equipment: Provide equipment offered as a standard catalog item, that which has a specific model number. The Manufacturer's catalog specification sheet or shop drawing shall identify all standard features, options, accessories, finishes and/or slight changes or modifications available. Shop or detail drawings shall be provided as requested.
- G. Fabricated Equipment: Provide equipment that is not a standard catalog item and must be built to the size and shape as required for this project. All fabricated equipment shall be constructed by a single authorized fabricator who shall provide detailed shop drawings and as-built drawings.
- H. Exposed: All visible surfaces or edges including those behind closed doors or access panels when opened, including when looking up from below.

1.03 REGULATORY REQUIREMENTS

- A. All items, work and materials for this section shall comply with the latest US Public Health Services, the National Board of Fire Underwriters, all federal, state, local laws, and ordinances. This includes but not limited to building codes, regulations, rules, and interpretations of the authorities having jurisdiction (AHJ).
 - 1. The equipment and installation must meet these minimum standards for this project.

[ADA]	Americans with Disabilities Act (Equipment & Installation)
[AGA]	American Gas Association (Gas equipment & Installation)
[ARI]	Air Conditioning and Refrigeration Institute (Remote Refrigeration)
[ANSI]	American National Standards Institute (Equipment & Installation)
[ASHRAE]	American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (Equipment & Installation)
[ASME]	American Society of Mechanical Engineers (Boilers & Installation)
[ASTM]	American Society for Testing and Materials (Metals, Glass, Sprayers)
[AWS]	American Welding Society (Structural welding code)
[ICBO]	International Conference of Building Officials
[NEC]	National Electrical Code (Wiring & devices included with Food Equipment)
[NSF]	National Sanitation Foundation (Equipment & Installation)
[NEMA]	National Electrical Manufacturers Association (Equipment & Installation)
[NFPA]	National Fire Protection Association (Equipment, Installation & Fire Systems)
[OSHA]	Occupational Safety and Health Agency (Equipment & Installation)
[SMACNA]	Sheet Metal & Air conditioning Contractor's National Association
[UL]	Underwriters Laboratories (Electrical Products, Components Assemblies)

- [EISA] The Energy Independence and Security Act of 2007 (Walk-Ins, Refrigeration Systems)
- [RSES] Refrigeration Services Engineers Society (Remote refrigeration systems, components, & installation)
- 2. Safe Drinking Water Act: Lead-free plumbing fittings, faucets and fixtures or more stringent state/local codes where applicable.
- 3. Laws, Codes and Regulations: Contact State and local authorities that have jurisdiction to verify any special laws, codes, regulations or permits that may be required for this project. The FSEC shall submit to local health sanitarians, engineers, building inspectors that have jurisdiction, drawings and or specifications for clarification upon request.
- [UBC] Uniform Building Code (Equipment & Installation)
- [BOCA] Basic Building Code (Equipment & Installation)
- [SBCC] Standard Building Code (Equipment & Installation)
- [IBC] International Building Code (Equipment & Installation)
- 4. All equipment provided for this project shall have an NSF label.
- 5. All electrically operated, manufactured, or fabricated equipment shall meet the current National Electrical Code standards. The equipment shall be U.L. listed and tested to agency standards or be acceptable to authorities have jurisdiction.
- 6. Where the drawings and specifications require a larger size or higher standard than is required by regulations, the drawings or specifications shall govern.

1.04 ALTERNATES AND SUBSTITUTIONS

- A. Procedure: Submit written requests at least ten (10) days prior to the bid date and time, to the project Architect. Manufacturer or fabricator changes are not acceptable after submittal review and acceptance without written authorization from FC Design and the Owner's Representative. Each request shall include the following information:
 - 1. Item number, description, and statement of how the proposed substitution is a betterment to the project.
 - 2. Manufacturer's product data (specification sheets) for the specified item and the proposed substitution with annotations highlighting the performance features not meeting and/or exceeding the specification for each item. Remove information that is not being supplied or required.
 - 3. Manufacturer's shop drawings for Fabricated Equipment that do not have standard product data (specification sheets) with annotations highlighting the performance features not meeting and/or exceeding the specification for each item.
- B. Approval: The project Architect, Construction Manager, or General Contractor shall submit the request to FC Design for review. FC Design will review the proposed substitution with the Owner's Representative. The decision of FC Design and the Owner's Representative to approve or reject each request is final and binding. Determination may or may not state the reason for the decision. If approved, the project Architect will issue an addendum stating the approved alternate(s) to prime bidders of record. Verbal approval is not binding.
- C. Responsibility: If a proposed alternate or substitution is accepted, the FSEC shall pay all costs required to modify the work of any trade affected to accommodate the substitution.
- D. Substitutions for failure to order equipment in a timely manner are not acceptable.
- E. Substitutions that do not comply with the requirements of the bid documents are not acceptable.

1.05 SUBMITTALS

- A. Procedure: Provide each of the following submittals in PDF format to the Architect and/or Owner's Representative for review and comment. The FSEC shall stamp and sign each submittal document indicating it has been reviewed by them and checked for conformance to the specifications, field dimensions, compatibility with other equipment and coordination with other trades and services prior to submittal.
 - 1. Bid Summary: The FSEC shall provide a Bid Summary within 10 days of the contract award. The Bid Summary shall include foodservice equipment prices per item, freight, delivery to the job site, installation, and sales and use tax.
 - 2. Schedule: The FSEC shall provide a schedule of key dates and tasks that must be completed by others to meet the equipment installation schedule within 30 days of contract award.

3. Procurement Progress: The FSEC shall provide a monthly letter to the Prime Contractor summarizing procurement progress, items stored, items delivered, items installed.
4. Product Data: The FSEC shall provide product data within 45 days of receiving a signed contract that include the following. Include a table of contents showing item number, description, and page number. Include product data (specification sheets) for every item of foodservice equipment included in this section including all new, existing, relocated, and future equipment. Annotate only relevant requirements and remove all information that is not applicable or relevant. Include a cover sheet for each item with item number and description, manufacturer, model number, quantity, optional features, special construction, installation, and utility requirements. Copies of the project specifications are not acceptable.
5. Notice of Field Verification: The FSEC shall provide a letter to the Architect and/or Owner's Representative stating that "the foodservice equipment rough-ins and special condition drawings have been field verified and fully comply with the equipment that is being provided within the contract."
6. Shop Drawings: The FSEC shall provide shop drawings at 3/4" = 1'-0" scale or larger for every Fabricated Equipment item including the following. Submit each of the following separately.
 - a. Cold Storage Rooms: Show dimensions, materials, manufacturer, type of hardware, floor configuration details, weight capacities, and other pertinent data as specified and as required for construction. Indicate partial plans and elevations to illustrate the cold storage rooms and adjacent building elements. Cold storage room dimensions are subject to adjustments required by field verified dimensions. The FSEC shall measure and coordinate with finished building conditions.
 - b. Kitchen Ventilation Systems: Show dimensions, materials, manufacturer, hardware, and other pertinent data as specified and as required for construction. Indicate partial plans and elevations to illustrate the kitchen ventilation systems and adjacent building elements. Include wiring diagrams, details, and installation instructions. Include fire protection details and installation instructions.
 - c. Stainless Steel Fabrication: Show dimensions, materials, stainless steel grade and gauge, manufacturer, hardware, and other pertinent data as specified and as required for construction. Indicate partial plans and elevations to illustrate the junction condition where fabricated equipment adjoins other equipment. Show cutout locations, field welds and joints, reinforcement, edge profiles, and installation details and methods. Fabricated Equipment dimensions are subject to adjustments required by field verified dimensions and understructure components. Field measure and coordinate with finished building conditions. Field verification shall be completed by a company approved by the approved custom fabricator.
 - d. Modular Bar Diewall: Show dimensions, manufacturer, hardware, and other pertinent data as specified and as required for construction. Indicate partial plans and elevations to illustrate the millwork and adjacent equipment and building elements. Show cutouts, countertop seams, reinforcement, edge profiles, and installation details and methods. Millwork dimensions are subject to adjustments required by field verified dimensions and understructure components. Field measure and coordinate with finished building conditions. Field verification shall be completed by a company approved by the approved millwork fabricator.
7. Coordination Drawings: The FSEC shall provide coordination drawings using the Architect's dimensioned plans and matching the sheet size of the bid documents within 45 days of receiving a signed contract. Show all foodservice equipment that is specified in Section 11 4000 including owner furnished, existing, and future equipment. Leave room for review stamps, FSEC title block, and information. It is not acceptable to copy the bid documents as this submittal. Include the following sheets:
 - a. Foodservice equipment floor plan(s) at 1/4" = 1'-0" scale with equipment tags. Match the numbering of the bid documents and include equipment schedule(s) on the same sheet as corresponding the equipment plan(s).
 - b. Foodservice equipment elevations at 1/2" = 1'-0" scale with equipment tags matching the numbering of the bid documents.
 - c. Foodservice equipment plumbing rough-in plan(s) at 1/4" = 1'-0" scale showing exact rough-in locations with a utility symbol legend and a schedule of the utility requirements showing the equipment item number and heights. Make allowances for valves, fittings and other required components specified in Divisions 22 and 23. If utilities are already installed, field measure locations and indicate on plan, noting any objection to installed location. Dimension utility rough-ins installed in- floor from existing walls, exterior walls, or column line centers. Dimension other rough-ins from new walls.

- d. Foodservice equipment electrical rough-in plan(s) at 1/4" = 1'-0" scale showing exact rough-in locations with a utility symbol legend and a schedule of the utility requirements showing the equipment item number and heights. Make allowances for other required components specified in Division 26 and 27. If utilities are already installed, field measure locations and indicate on plan, noting any objection to installed location. Dimension utility rough-ins installed in- floor from existing walls, exterior walls, or column line centers. Dimension other rough-ins from new walls.
 - e. Foodservice equipment special conditions plan(s) at 1/4" = 1'-0" scale showing the foodservice equipment layout with the finished locations of wall backing, recessed floors, curbs, special wall heights, wall openings, and equipment bases. Include a symbol legend. Dimension from new or existing walls, exterior walls, or column line centers.
- B. Approval: Submittals not complying with the above outline shall be rejected and must be resubmitted until correct.
 - C. Coordination: The FSEC is directly responsible for the accuracy of information on their Submittals. If a change on one submittal causes a change to another, the affected submittal(s) must be revised and resubmitted as well.

1.06 CLOSEOUT DOCUMENTS

- A. Operation and Maintenance Manuals
 - 1. The FSEC shall provide: Two sets of manuals for foodservice equipment items, including (two sets of fabricated equipment as-built shop drawings. These manuals shall be ordered alphabetically by the manufacturer, separated by tabs, and include a cover sheet for each item. The cover sheet shall include the item number, description, manufacturer, model, serial number, and utility information.
 - a. Provide current installation and operation manuals and parts manuals for all new foodservice equipment specified in this Section. Include the Manufacturer's name, address, and phone number. Include the local authorized service agent's (ASA) name, address, and phone number. List the FSEC if no local ASA is available. These manuals shall be delivered before the beneficial date of occupancy.
 - b. Video record all training, operation, maintenance, instructions and provide digital and physical copies to the Architect and/or Owner's Representative.
- B. As-Built Documents: The FSEC shall maintain one record set of as built drawings and product data with all related changes, corrections, revisions, additions, deletions as noted during the construction or installation phase. Provide these documents at the same time as the O&M data manuals.
- C. Warranty Documents: [Ref: Section 11 4000, Part 3, Subpart 3.07]

1.07 SITE CONDITIONS

- A. The FSEC shall field verify all on site surfaces, prepared openings, finished building dimensions and utility rough-ins to ensure that the site is ready for the equipment installation. This shall include but not limited to the verification and coordination of work by others including lighting fixtures, HVAC equipment, grease traps, building sprinkler systems, electrical services, and plumbing services.
- B. The FSEC shall ensure Fabricated Equipment conforms to site dimensions and conditions and inform the Prime Contractor of any potential problems with the Fabricated Equipment, the work schedule, and delivery. Where field measurements cannot be made without delaying the work, the FSEC shall document and coordinate critical dimensions with the Prime Contractor to proceed with procurement.
- C. The FSEC is responsible for changes to the equipment and/or cutting and patching of walls, partitions, ceilings, and floors necessary to receive and operate the equipment caused by failure to coordinate with the site conditions.

PART 2 PRODUCTS**2.01 FABRICATOR QUALIFICATIONS****A. Qualifications**

1. Foodservice equipment fabricators must have a minimum of five years of experience in fabricating foodservice equipment like that indicated for this project and with a record of successful performance.
2. All custom fabricated equipment, excluding trim and corner guards, shall be provided by the same fabricator unless otherwise specified.
3. The custom fabricator shall field measure and verify as needed prior to fabrication.
4. The custom fabricator shall have factory-direct post-installation warranty support.

B. Approved custom stainless steel fabricators: The following companies have been approved for this project. Substitutions may be requested per the procedure specified in Part 1 of this Section.

LSV Metals Inc.	Two Rivers Enterprises	BSI Inc.
Attn: Jason Johnson	Attn: Bob Struzyk	Attn: sales@bsidesigns.com
8424 Sunset Rd.	490 River St. W, PO Box 70	601 E. 64 th Ave, Bldg. A
Spring Lake Park, MN 55432	Holdingford, MN 56340	Denver, CO 80229
(612) 868-2252	(320) 746-3156	(303) 331-8777

2.02 MATERIALS**A. Metals**

1. Stainless Steel and Galvanized Steel Gauges Shall conform to the following thicknesses and tolerance. All gauges shall be within $\pm 5\%$ of the indicated thickness.

Gauge	Thickness
10	0.1406"
12	0.1094"
14	0.0781"

Gauge	Thickness
16	0.0625"
18	0.0500"
20	0.0375"

2. Standard Gauges of Fabricated Equipment elements:

- | | |
|----------|---|
| 10 Gauge | Gusset plates. |
| 12 Gauge | Hat and "U" channel under bracing, hardware reinforcement. |
| 14 Gauge | Worktable tops, counter tops, dish table tops, drainboards, sinks, sink inserts, sink drainboards, and brackets. |
| 16 Gauge | Cabinet bases, mullions, elevated wall shelves, elevated wall cabinets, lower and intermediate shelves, legs, cross bracing, door fronts, drawer fronts, and panel skirts. |
| 18 Gauge | Door enclosures, drawer enclosures, access panels, removable covers, enclosure trim panels for walk-in cold storage rooms and kitchen ventilation systems, and trim strips, exhaust hoods, wall panels, and drawer pan inserts. |

3. Stainless Steel

- a. All stainless steel used in the fabrication of Fabricated Equipment shall be first-grade austenitic chromium-nickel alloys. Provide AISI Type 304 stainless steel unless otherwise specified. Ferritic and martensitic alloys are not acceptable unless otherwise specified or without approval from FC Design.
- b. AISI Grade Specifications

AISI Grade	Cr	Ni	Mo	C	Remarks
Type 304	18.0-20.0%	8.0-10.5%	-	<0.07%	Standard
Type 304L	18.0-20.0%	8.0-12.0%	-	<0.03%	Low-C 304
Type 316	16.0-18.0%	10.0-14.0%	2.0-3.0%	<0.08%	Superior corrosion resistance
Type 316L	16.0-18.0%	10.0-14.0%	2.0-3.0%	<0.03%	Low-C 316
Type 317L	18.0-20.0%	11.0-15.0%	3.0-4.0%	<0.04%	Superior corrosion resistance
Type 321	17.0-19.0%	9.0-12.0%	-	<0.08%	Ti stabilized

- c. Grind and polish surfaces producing a uniform, directional textured finish, free of cross scratches, tool, die marks and stretch lines. Polish exposed surfaces to a #4 (brushed) finish with the grain running parallel to the longer dimension for each piece. Remove any embedded foreign matter and leave surfaces chemically clean. Clean and deburr all edges and corners.

- d. Exposed surfaces shall be protected from damage using a temporary strippable or peel-off covering.
- e. ANSI Type 304, #4 mechanical finish, 180 grit, seamless or welded annealed, ground smooth, polished, heat treated and quenched to eliminate precipitation, drawn true, and polished with concentric grain.
- 4. Galvanized Steel: Provide Armco (or equivalent) hot-dipped, tight-coat galvanized iron. Use the largest sheets possible with as few joints as necessary. Smooth welded or damaged surface areas and cover with two coats of gray hammer-tone epoxy spray paint.
- 5. Gussets: Provide enclosed type with a minimum 3" top diameter. Continuously weld gussets to the underside of table top framework sink bottoms and drainboards.
- B. Hardware
 - 1. Fasteners: Bolts, screws, and nuts shall be stainless steel or the same material of the surface applied, spaced for best fastening. All exposed fastener threads shall be capped, including those located inside cabinets, with stainless steel lock washers and stainless steel cap nuts. Rivets are not an acceptable method of attachment.
 - 2. Drawer pulls shall be Component Hardware Model P46-1010 with brushed stainless finish unless otherwise specified.
- C. Sound Deadening: All sound deadening on Fabricated Equipment shall be spray-on mastic unless otherwise specified.
 - 1. The exposed underside of stainless steel work surfaces and sink bottoms shall have a smooth finish and coating shall be held 1" back from open edges. No coating may extend past the front sink cove corners.
 - 2. Where sound deadening pads are specified, provide Schnee-Morehead or equal tape type sealant between all tops and under bracing and frame members.
- D. Sealants: At minimum shall meet FDA's regulation #21 CFR 177.2600 and NSF C2 in foodservice area and/or ASTM C920 Type S, Grade NS in non-foodservice areas. Limit colors to aluminum, clear or white.
- E. Glass: Provide a minimum 3/8" tempered, unless otherwise noted or specified.
- F. Adhesives
 - 1. Joint adhesives shall fully comply with the requirements and recommendations of the manufacturer of the adjacent materials. Use Akemi North America epoxy-type joint adhesive unless otherwise directed by the adjacent material manufacturer. The joint sealant shall be tinted to match quartz surfacing. Silicone joint seaming is not acceptable for adjoining solid surface and quartz composite materials.
 - 2. Substructure Mounting Adhesive shall fully comply with the requirements and recommendations of the manufacturer(s) of the adjacent materials. Use flexible silicone, epoxy, or polyester adhesive unless otherwise directed by the adjacent material manufacturer(s).
- G. Supports and backing shall be as detailed and fully comply with the Manufacturer's recommendations.

2.03 FABRICATED EQUIPMENT QUALITY STANDARDS

- A. Remove burrs from sheared edges of metalwork, ease the corners, and smooth to eliminate a cutting hazard. Bend sheets of metal at not less than the minimum radius required to avoid grain separation in the metal. Maintain flat, smooth surfaces, without damage to the finish.
- B. Reinforce metal at locations of hardware, anchorages, and accessory attachments wherever metal is less than 14 gauge or requires mortised application. Conceal reinforcements to the greatest extent possible. Neatly finish the reverse side. Depressions at these points are not acceptable.
- C. Where components of Fabricated Equipment shall be galvanized and involve welding or Machining of metal heavier than 16 gauge, complete the fabrication and provide hot-dip galvanizing of each component to the greatest extent possible. Comply with ASTM A123 Standard Specification for zinc (hot-dip galvanized) coatings on iron and steel products.

PART 3 EXECUTION**3.01 STORAGE AND DELIVERY**

- A. All equipment shall be stored in a bonded or insured company warehouse. The storage space shall be dry, well-ventilated with the equipment placed on blocking at least 6" above the floor. All precautions shall be taken to prevent any corrosion or damage to the stored equipment. The storage location shall be open for inspection at any time prior to equipment installation.
- B. The equipment shall be delivered to the project site in factory assembled units with protective crating and coverings free from manufactures defects or damage due to shipping, delivery, unloading or handling. Damaged items found prior to acceptance shall be rejected and must be immediately removed and replaced without additional costs or delays.

3.02 PRELIMINARY INSPECTION

- A. The FSEC shall field verify the dimensions and conditions of all spaces where foodservice equipment installed in the scope of work is located. Conform to the finished building conditions and submit written notification to the Architect and Owner's Representative if building conditions prevent equipment from functioning properly.
- B. The FSEC shall coordinate the equipment dimensions with the building openings and construct equipment in sections sized to the limitations of the openings.
- C. The FSEC shall field verify that the voltages, air volumes, water temperature, water pressure, gas pressure, and steam pressure meet the equipment requirements and coordinate changes to ensure proper operation.
- D. The FSEC shall notify the Prime Contractor, Architect, and Owner's Representative of any deficient conditions. It is not acceptable to cover deficient work. By commencing the installation of equipment, the FSEC accepts the site conditions. The FSEC is responsible of all expense(s) of changes to equipment and/or building element modifications necessary to receive and operate the equipment caused by the FSEC's failure to coordinate with site conditions and or notify the Prime Contractor, Architect, and Owner's Representative of deficient conditions.

3.03 INSTALLATION

- A. Foodservice Equipment Installer Qualifications:
 - 1. The foodservice equipment Installer shall have at least five years of experience installing foodservice equipment on consultant specified projects of similar size and complexity.
 - 2. If field welds are required, the foodservice equipment Installer shall provide a currently certified NSF welder who is an employee of the Installer to perform all foodservice equipment field welding and polishing.
 - 3. Provide references for two projects of similar size and complexity completed within the past five years to the Owner's satisfaction if requested.
- B. The FSEC shall coordinate the installation schedule with the Prime Contractor and Owner's Representative and shall comply with the requirements of the construction schedule including correcting deficient work. Submit written notification of any manufacturer or construction-related issues that are causing a delay in the equipment delivery and/or installation. The FSEC shall not delay the project completion.
- C. The installation shall fully comply with the requirements of all applicable current national, state, and local codes.
- D. Install trim to enclose the equipment to the adjacent building elements that cannot be sealed with silicone as specified and as required by code, whichever is greater. All trim material shall match the adjacent equipment surface. Exposed fasteners are not acceptable. unacceptable as a substitute for accuracy and neatness.
- E. The FSEC shall use all reasonable means to protect the equipment, fixtures, and materials before, during and after the installation and prior to the final acceptance of the project. The foodservice equipment shall not be used for tool or material storage, work benches, scaffolding, stepladders, work platforms or stacking areas, by either the FSEC or other trades. The FSEC shall replace or repair items that are lost or damaged prior to Owner acceptance.

3.04 EXISTING EQUIPMENT

- A. Existing equipment that is being removed or relocated shall be disconnected from connected utilities by licensed contractors as stated in Part 1 of this Section.
 - 1. The FSEC shall disassemble (if required), remove, and store until ready for installation all equipment that is to be relocated. Once the site conditions are ready for installation, the FSEC deliver and locate the equipment per plan and ready it for interconnections and final connections. It is expected that the equipment will be in the same working order as when it was removed from service.
 - 2. The FSEC shall submit an inventory identifying each piece of equipment removed, including all attachments and accessories, that states the working order of the equipment when removed from service to the Owner's Representative and FC Design for review.
 - 3. The Owner's Representative has the option to retain existing equipment. An authorized demolition contractor (not included in the FSEC scope of work) shall obtain written authorization from Owner's Representative to remove equipment from site. This contractor will remove and dispose of equipment that is not being relocated.

3.05 CLEANING

- A. The FSEC shall remove masking and protective coverings from stainless steel and other finished surfaces.
- B. Clean and polish equipment including glass, plastic, hardware, accessories, fixtures, and fittings prior to the inspection and acceptance of the Work.
- C. Existing equipment shall be installed in the same state as when it was removed from service.

3.06 START-UP AND DEMONSTRATION

- A. Start-up
 - 1. All electrical, plumbing, and gas connections to the equipment shall be completed prior to beginning start-up. This includes ensuring that the utility connections have been fully tested, purged, sanitized, and adjusted. The FSEC shall obtain written confirmation for each trade that this is complete.
 - 2. The FSEC shall provide factory-authorized representatives to perform the equipment start-up and test the full range of operation for all new foodservice equipment provided. The representatives shall make all necessary adjustments for the equipment installation and calibration.
 - a. Start and run all refrigeration equipment for a minimum of 48-hours and verify that it operates as intended and holds the design temperatures within the Manufacturer's operating tolerance and without excess noise or vibration. New equipment not holding temperature shall be immediately repaired or replaced.
 - b. Coordinate dishmachine testing with Detergent Vendor.
 - c. Properly activate water filtration systems for the foodservice equipment per Manufacturer's recommendations.
 - d. Calibrate controls, operating temperatures, pressure regulators, gas burners, motor rotations, and safety switches.
 - 3. The FSEC shall provide a letter of completion to the Architect and Owner's Representative stating that all equipment provided and/or installed by the FSEC has been completely inspected, adjusted, calibrated by the FSEC or an authorized service agent after the FSEC has completed all final equipment testing and training demonstrations to the owner's satisfaction.
- B. Demonstration and Training
 - 1. The FSEC shall organize, schedule, and coordinate equipment operating and maintenance training demonstration(s) with the Owner's Representative. After coordinating availability with the Owner's Representative and Manufacturer's Representatives, the FSEC shall submit a training schedule to the Owner's Representative.
 - 2. Provide copies of all instructional, operational, maintenance manuals, charts and audio and video media at least two weeks prior to demonstration.
 - 3. Authorized Manufacturer's Representatives and/or service technicians shall review data manuals and provide hands-on operational, cleaning, and maintenance instructions to the Owner's Personnel and the appropriate inspectors for each piece of serialized equipment and Fabricated Equipment.
 - 4. The FSEC shall host the training demonstrations on site and provide a written record of the attendees and a list of unresolved questions raised from the training session to the Architect.

5. Submit a combined chart summarizing the demonstrations that includes the item number, equipment description/category, date of training, person and firm responsible for the training, and attending Owner's Representative's initials.

3.07 WARRANTY

- A. General Foodservice Equipment Warranty: The following warranty shall not deprive the Owner of other rights they are entitled to under other provisions of the contract documents. The following warranty shall be in addition to and run concurrently with warranties under other provisions of the contract documents.
 1. The FSEC shall provide a one-year parts and labor warranty for all new foodservice equipment specified in this section beginning on the beneficial date of occupancy.
 2. The FSEC shall provide a minimum of a five-year replacement compressor warranty on all refrigeration equipment that covers the total cost of the compressor replacement. The FSEC shall provide a one-year service contract that covers repairs without charge for materials, labor, and travel on all new refrigeration systems specified in this Section. If a malfunction occurs outside of the one-year service contract period, the owner shall be responsible for labor costs unless the malfunction is caused by improper installation. The FSEC shall be responsible for all repair costs caused by improper installation.
 3. The FSEC shall respond to the Owner's request for service on refrigeration systems within 4 hours or less to reduce the loss of food product. The FSEC shall respond to the Owner's request for service on equipment without refrigeration systems within 24 hours of request.
- B. The FSEC shall obtain a letter of substantial completion from the Prime Contractor stating the beneficial date of occupancy. All warranties shall start on the beneficial date of occupancy.
- C. The FSEC shall provide completed copies of all warranty documents with the Closeout Documents.

3.08 ITEM SPECIFICATIONS

- A. The following item specifications are based on the model numbers available at the time of preparing the construction documents. The FSEC shall notify FC Design if these models are not available at the time of bid in accordance with the requirements listed in Part 1 of this Section.
- B. The FSEC shall provide the following specified foodservice equipment items or approved alternates in accordance with the requirements listed in Part 1 of this Section.
- C. Consolidate equipment manufacturers to provide a single point of contact to the Owner.
 1. All walk-in cold storage room refrigeration systems shall be manufactured by a single company.
 2. All reach-in refrigeration equipment shall be manufactured by a single company.
 3. All stainless steel Fabricated Equipment shall be manufactured by a single company.
 4. All millwork Fabricated Equipment shall be manufactured by a single company.
 5. All plumbing fixtures shall be manufactured by a single company.
 6. All ice machines shall be manufactured by a single company.
 7. All ranges shall be manufactured by a single company.

ITEM 1 - INDOOR WALK-IN COMBINATION COOLER FREEZER COMPLEX, RECESSED (1 REQ'D)

ThermalRite Model E113165-3

Walk-in combination cooler (+35°F)/freezer (-10°F), indoor, modular panel, high-density foam rail construction, sized per plans.

Insulation: Non-HCFC urethane foam, class-1, tongue-and-groove high-density foam rails with cam-locks, UL-listed, NSF-listed.

Wall panels: 4" thick. White 24 ga. Sanisteel with 6mm anti-microbial coating interior finish, embossed 24 ga., type-304 stainless steel with 1/8" aluminum tread brite wainscoting from T.O. cove base to 36" AFF exposed exterior finish in kitchen, Medium Bronze 03 exposed exterior finish in bar, and embossed 26 ga. acrylume concealed exterior finish.

Ceiling panels: 5" thick. Sanisteel with 6mm anti-microbial coating interior finish, embossed 24 ga., type-304 stainless steel exposed exterior finish, and embossed 26 ga. acrylume concealed exterior finish.

Floor panels: 4-1/8" thick reinforced floor designed for 175 lb point load and 5,000 PSF uniform load. 0.050 smooth aluminum interior finish and embossed 26 ga. acrylume concealed exterior finish.

Light(s): (4) LED, 48"L, 5,400 lumens, CRI>82, non-dimming, vapor-tight, with full-length shatterproof polycarbonate lens and one piece white polycarbonate body, class-2 fixture, IP65.

Enclosure/trim: Provide trim and enclosure panels to cover all gaps between the exterior of the insulated panels and the adjacent building walls and ceilings. Provide removable panels were noted per plans and elevations.

Sealant: Silicone, match panel finish. Fully seal all panel joints and penetrations.

Warranty: 1-year parts and labor warranty on modular panels and accessories that covers defects in workmanship - NOT refrigeration or Install.

- 1 ea. D01 - Door, cooler, hinged, flush-mounted, 36"W x 78"H finished opening with insulated panel and jamb, heated jamb (4-sided), and heated door sweep.
Hinges: (3) Kason 1248 hinges with spring mechanism, high-lift cam system, drilled and countersunk for 1/4" flat-head screws, and built-in dwell that holds door open beyond 130°.
Door Closer: (1) Kason 1094 door closer with hydraulic, concealed-mounting, and extra-wide hook. 12 ga. CRS (ASTM A1008) chrome plated. Concealed-mounting. Magnetic Gasket.
Handle: (1) Kason 0027C handle with locking deadbolt, drilled and countersunk for 1/4" flat-head screws. Polished chrome. Key all walk-in door locks the same.
Inside Release: (1) Kason 0485 1/4-turn low-conduction inside release with glow in the dark surface. Meets ADA requirements for emergency egress.
Kick-plate(s): 1/8" aluminum tread brite on door and jamb, interior and exterior, 36"H.
 Transit level at door(s). Provide a smooth transition from exterior to interior with no threshold.
- 1 ea. Model VIEWPORT-COOLER Viewport, cooler, 14"W X 24"H, with heated frame.
- 1 ea. D02 - Door, freezer, hinged, flush-mounted, 36"W x 78"H finished opening with insulated panel and jamb, heated jamb (4-sided), and heated door sweep.
Hinges: (3) Kason 1248 hinges with spring mechanism, high-lift cam system, drilled and countersunk for 1/4" flat-head screws, and built-in dwell that holds door open beyond 130°.
Door Closer: (1) Kason 1094 door closer with hydraulic, concealed-mounting, and extra-wide hook. 12 ga. CRS (ASTM A1008) chrome plated. Concealed-mounting. Magnetic Gasket.
Handle: (1) Kason 0027C handle with locking deadbolt, drilled and countersunk for 1/4" flat-head screws. Polished chrome. Key all walk-in door locks the same.
Inside Release: (1) Kason 0485 1/4-turn low-conduction inside release with glow in the dark surface. Meets ADA requirements for emergency egress.
Kick-plate(s): 1/8" aluminum tread brite on door and jamb, interior and exterior, 36"H.
Vent: (1) Kason 1832 hi-flow heated pressure relief port, 115V.
 Transit level at door(s). Provide a smooth transition from exterior to interior with no threshold.
- 1 ea. Model VIEWPORT-FREEZER Viewport, freezer, 14"W X 24"H, with heated frame and glass.
- 2 ea. Model SMARTRITE EVRWI-TFT User interface module, 5" TFT full-color capacitive touchscreen display, (multi-way) light control, battery backup, door heater and viewport heater control, temperature and relative humidity monitoring and logging for up to two rooms, on-board data storage with automatic roll-over, audio-visual alarms, with remote annunciation and notification capabilities, door open alarm, high and low temperature alarm, entrapment alarm, power failure monitoring and alarm, Bluetooth and WIFI capabilities via smartphone app, automated HACCP logging and tracking, and third-party BAS (Building Automation System) compatibility. Eliminates the need for manual data entry, streamlining your tasks and improving overall efficiency.

- 2 ea. Model KASON THERMAL-FLEX Swing door(s), 402 smooth vinyl, clear, sized per plans, with aluminum channel and 270° self-closing stainless steel gravity hinge that adapts to all door widths. Meets US FDA and NSF standards. Provide two-panels for openings wider than 36".
Impact plates: 36"H from 6" AFF to 42" AFF. Warranty: 10-year warranty against rust.
- 1 lt. Model SS-COVEBASE-INT Cove base on all interior walls of cooler, 22 ga., type-304 stainless steel with #2B finish, 6"H.

ITEM 1.1 - THERMOPLASTIC FLOORING, FREEZER-SECTION (1 REQ'D)

BMI Installs, Inc. Model TITAN

Thermoplastic flooring in freezer, dark gray stipple finish, sized per plan. 600 PSI tensile strength per ASTM D-412. 100% recycled thermoplastic polyvinylchloride, interlaced with strand reinforcements. 0.88 wet coefficient of friction and 0.92 dry coefficient of friction (or greater) for slip resistance exceeding OSHA and ADA requirements. NFDA type-1 rated. Adhere to insulated floor panel underlayment with stabilized water-resistant two-part epoxy.

- 1 ea. Model WARRANTY 10 year installation warranty covering the installation of the thermoplastic flooring against seam failure, improperly sealed drains or base material allowing water penetration, separation of flooring from substrate due to improper adhesive application, installation of defective materials, improper installation of stainless steel accessories or base trim, and damage or failure of the flooring system caused by the installer.

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 1.2 - UV DISINFECTION SYSTEM (1 REQ'D)

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 1.3 - PRO-E REACH-IN DOORS (1 REQ'D)

Energy Door Company Model 57225

Pro-E Reach-In Doors, French Openings (No Center Mullion) 28" wide x 79" high, Normal Temp, 3 Pane Non-Heated Glass.
Net Cooler Opening: 9' 9-7/8" Wide x 79" High.

Energy Controller: 1 Per Frame

Finish: Black, Handle: Black Metal

Lighting: EnVision FD (4000°K)

Shelving: 14 (56" wide x 27" deep), Flat, Black w/PTM (PN 500-20021-0101)

Posts/Uprights: 3 (85" high x 27" deep) Welded Uprights, Black (PN 501-10076-0101)

Swing: [L,R,L,R], Locks: [N,N]

Frame: (1 Normal Temp, Heated, Full Flange Frame [4])

- 1 ea. Model PN 240-10037-0200 MiniRoller Mat 28" W x 27" D (26-3/8"Wx25-7/8"D)
- 1 ea. Model PN N/A Conversion Charge to specified wide
- 1 ea. Model PN 240-10039-0101 Wire Divider, 27" D x 2.75" H, Black (2.75"Hx25-7/8"D)
- 1 ea. Model PN 240-10048-0200 Front Stop, Clear, 28" W x 3.5" H (26-3/8"Wx3.5"H)
- 1 ea. Model PN 240-10046-0201 Rear Stop, Black, 28" W x 2.00" H (26-3/8"Wx2.00"H)

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 2 - COOLER REFRIGERATION SYSTEM (2 REQ'D)

ThermalRite Model PT0068MBNAYNA

Refrigeration system, self-contained, medium temperature (+35°F), indoor, air-cooled, R455A refrigerant, 6,770 BTUH, pre-assembled, and pre-wired with factory mounted components. Maintain 35°F at 90°F ambient.

Electrical: 208-230V/1-Ph, 8 Amps FLA, 9.3 Amps MCA, 15 Amps MOP, NEMA 6-15P.

- 2 ea. Model WARRANTY-COMPRESSOR Compressor-motor warranty: extended to 5-years, 1-year labor warranty.
- 2 ea. Model RSA 1-year refrigeration service agreement from walk-in manufacturer.

ITEM 3 - FREEZER REFRIGERATION SYSTEM (1 REQ'D)

ThermalRite Model PT0069LBNEYNA

Refrigeration system, self-contained, low-temperature (-10°F), indoor, air-cooled with electric defrost, R455A refrigerant, 6,860 BTUH, pre-assembled, and pre-wired with factory mounted components. Maintain -10°F at 90°F ambient.

Electrical: 208-230V/1-Ph, 16.7 Amps FLA, 19.8 Amps MCA, 30 Amps MOP, direct connection.

- 1 ea. Model WARRANTY-COMPRESSOR Compressor-motor warranty: extended to 5-years, 1-year labor warranty.
- 1 ea. Model RSA 1-year refrigeration service agreement from walk-in manufacturer.

ITEM 4 - 48" X 21" X 75"H, 5-TIER MOBILE SHELVING UNIT (1 REQ'D)

Cambro Model CPMU214875V5480

Mobile Starter Unit, 21"W x 48"L x 75-1/4"H, 5-tier, withstands temperature -36°F (-38°C) to 190°F (88°C), includes: (5) vented polypropylene shelf plates with antimicrobial protection, (2) pre-assembled post kits (posts constructed of steel with polypropylene exterior), (10) traverses, molded-in dovetails, (2) sets of post connectors, (4) premium swivel casters with total locking brake, 900 lbs. max capacity, speckled gray, Made in USA, NSF

ITEM 5 - 36" X 21" X 84"H, 4-TIER SHELVING UNIT (1 REQ'D)

Cambro Model EXU213684VS4480

Stationary Starter Unit, 21"W x 36"L x 84"H, 4-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (3) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (8) Universal Traverses & (4) bags of 4 dovetails (8 left, 8 right), speckled gray, 800 lbs. capacity per shelf /2,400 lbs. max capacity, Made in USA, NSF

ITEM 6 - 48" X 21" DUNNAGE RACK (1 REQ'D)

Cambro Model DRS480480

Dunnage Rack, slotted top, 3000 lb. load capacity, 21"D x 48"W x 12"H, polypropylene, one-piece, seamless double wall construction, includes (1) Camlink, 4" square legs, speckled gray, NSF, Made in USA

ITEM 7 - 36" X 21" DUNNAGE RACK (3 REQ'D)

Cambro Model DRS360480

Dunnage Rack, slotted top, 1500 lb. load capacity, 21"D x 36"W x 12"H, polypropylene, one-piece, seamless double wall construction, includes (1) Camlink, 4" square legs, speckled gray, NSF, Made in USA

ITEM 8 - 30" X 21" DUNNAGE RACK (1 REQ'D)

Cambro Model DRS300480

Dunnage Rack, slotted top, 1500 lb. load capacity, 21"D x 30"W x 12"H, polypropylene, one-piece, seamless double wall construction, includes (1) Camlink, 4" square legs, speckled gray, NSF, Made in USA

ITEM 9 - 42" X 24" X 78"H, 5-TIER MOBILE SHELVING UNIT (2 REQ'D)

Cambro Model EXMU244278V5480

Mobile Unit, 24"W x 42"L x 78-1/4"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (5) vented reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), (4) premium swivel casters with total locking brake, 900 lbs. max capacity, speckled gray, Made in USA, NSF

- 2 ea. Lifetime warranty against corrosion and rust

ITEM 10 - 36" X 24" X 78"H, 5-TIER MOBILE SHELVING UNIT (1 REQ'D)

Cambro Model EXMU243678V5480

Mobile Unit, 24"W x 36"L x 78-1/4"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (5) vented reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), (4) premium swivel casters with total locking brake, 900 lbs. max capacity, speckled gray, Made in USA, NSF

- 1 ea. Lifetime warranty against corrosion and rust

ITEM 11 - 36" X 24" X 84"H, 5-TIER SHELVING UNIT (1 REQ'D)

Cambro Model EXU243684V5480

Stationary Starter Unit, 24"W x 36"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (5) vented reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), 800 lbs. capacity per shelf /2,400 lbs. max capacity, speckled gray, Made in USA, NSF

ITEM 12 - 58" X 88" X 48" X 84"H 5-TIER U-SHAPED SHELVING UNIT (2 REQ'D)

Cambro Model U-Shaped Shelving Unit

Consisting of the following:

- 2 ea. Model EXU244884VS5480 - Stationary Starter Unit, 24"W x 48"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (4) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), 800 lbs. capacity per shelf /2,400 lbs. max capacity, speckled gray, Made in USA, NSF
- 2 ea. Model EXA244284VS5480 - Stationary Add-On Unit, 24"W x 42"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (4) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (2) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), speckled gray, 800 lbs. capacity per shelf /2,400 lbs. max capacity, Made in USA, NSF
- 4 ea. Model EXA243684VS5480 - Stationary Add-On Unit, 24"W x 36"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (4) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (2) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), speckled gray, 800 lbs. capacity per shelf /2,400 lbs. max capacity, Made in USA, NSF
- 4 ea. Model CSDS24H6480 - Dunnage Stand Support, 24"W x 6-1/2"H, recommended for units 54" or longer with weight loads over 600 lbs., speckled gray, NSF listed components, Made in USA
- 4 ea. Model EXCC5480 - Corner Connector Set, speckled gray (5) sets of left & right, Made in USA

ITEM 13 - 48" X 24" X 84"H, 5-TIER SHELVING UNIT (1 REQ'D)

Cambro Model EXU244884V5480

Stationary Starter Unit, 24"W x 48"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (5) vented reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), 800 lbs. capacity per shelf /2,400 lbs. max capacity, speckled gray, Made in USA, NSF

ITEM 14 - 42" X 21" X 84"H, 5-TIER SHELVING UNIT (5 REQ'D)

Cambro Model EXU214284VS5480

Stationary Starter Unit, 21"W x 42"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (4) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), speckled gray, 800 lbs. capacity per shelf /2,400 lbs. max capacity, Made in USA, NSF

ITEM 15 - 42" X 63" X 84"H 5-TIER L-SHAPED SHELVING UNIT (1 REQ'D)

Cambro Model L-Shaped Shelving Unit

Consisting of the following:

- 1 ea. Model EXU214284VS5480 - Stationary Starter Unit, 21"W x 42"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (4) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (4) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), speckled gray, 800 lbs. capacity per shelf /2,400 lbs. max capacity, Made in USA, NSF
- 1 ea. Model EXA244284VS5480 - Stationary Add-On Unit, 24"W x 42"L x 84"H, 5-tier, withstands temperature from -36°F (-38°C) to 190°F (88°C), includes: (4) vented and (1) solid reinforced polypropylene shelf plates with antimicrobial protection, (2) composite posts with leveling feet installed, pre-assembled post connectors & wedges, (10) Universal Traverses & (5) bags of 4 dovetails (10 left, 10 right), speckled gray, 800 lbs. capacity per shelf /2,400 lbs. max capacity, Made in USA, NSF
- 1 ea. Model CSDS24H6480 - Dunnage Stand Support, 24"W x 6-1/2"H, recommended for units 54" or longer with weight loads over 600 lbs., speckled gray, NSF listed components, Made in USA
- 1 ea. Model EXCC5480 - Corner Connector Set, speckled gray (5) sets of left & right, Made in USA

ITEM 16 - CAN RACK (1 REQ'D)

Cambro Model CPU243672C96480

#10 Can Rack Stationary Unit, 24"W x 36"L x 72"H (26"W with can rack overhang), includes: (2) assembled post kits (posts constructed of steel with polypropylene exterior), (9) traverses & molded-in dovetails, (15) can rack panels, (72) can rack brackets, 800 lbs. capacity per shelf /2,000 lbs. max capacity, speckled gray (assembly required), Made in USA

ITEM 17 - HAND SINK WITH KNEE VALVE APRON AND SIDE SPLASH (1 REQ'D)

John Boos Model PBHS-W-1410-KV1APS

Hand Sink, wall mount, 14"W x 10"D front-to-back x 5" deep bowl, 3-1/2"H splash mount gooseneck faucet, knee activated with hinged front apron, 2" drain opening with basket drain, includes: mounting bracket, stainless steel construction, NSF

- 1 ea. Model PB-HSSS1410R Side Splash, 15-1/4"W x 9-3/4"H, for right side of hand sink with splash mount faucet, bolt on, ships loose for field installation, includes: installation hardware, 18/300 stainless steel (per each)
- 1 ea. Model PB-MV Tempering Valve, manual temperature mixing valve with built in check valves, rough chrome finish, 9/16 -24 UNEF threads to accept 3/8" compression female hose fitting

ITEM 17A - HAND SINK WITH KNEE VALVE APRON (1 REQ'D)

John Boos Model PBHS-W-1410-KV1APS

Hand Sink, wall mount, 14"W x 10"D front-to-back x 5" deep bowl, 3-1/2"H splash mount gooseneck faucet, knee activated with hinged front apron, 2" drain opening with basket drain, includes: mounting bracket, stainless steel construction, NSF

- 1 ea. Model PB-MV Tempering Valve, manual temperature mixing valve with built in check valves, rough chrome finish, 9/16 -24 UNEF threads to accept 3/8" compression female hose fitting

ITEM 18 - 108" X 88" L-SHAPED WORKTABLE WITH PREP SINKS (1 REQ'D)

Approved Fabricator Model Q-10888LWPS

Worktable with (2) prep sinks, 108"W x 30" front-to-back x 88"L x 46"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-C marine edge, 2"D x 10"H type-A backsplash with (1) set of 8" O.C. faucet holes and (1) set of 6" O.C. vacuum breaker holes, and type-B framework with sound deadening pads between all support channels and the top. Mitered corners.

Base: 16ga. type-304 stainless steel 1-5/8" dia. legs with adjustable bullet feet, 1-5/8" dia. cross bracing with adjustable set-up and stainless steel undershelf with sound deadening pads and type-B framework. The base shall be removable from the top.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

- 1 ea. Model Q-SINK-PREP 14ga., type-304 stainless steel Type-B, [Ref. QF603/View 2](#) weld-in undermount sink with provisions for 6" dia. disposer sink adapter (fabricator installed). Include cutout, welding, and polishing.
- 1 ea. Model Q-SINK-PREP 14ga., type-304 stainless steel Type-A, [Ref. QF603/View 2](#) weld-in undermount sink with rear overflow cutout, and 3-1/2" drain opening. Include cutout, welding, and polishing.
- 1 ea. Model Q-TUB-SKIRT Tub skirt, full 16ga., type-304 stainless steel construction to enclose sink bowl(s). Refer to plans and elevations for specific sizing. Refer to fabrication details.
- 1 ea. Model Q-DISPOSER-CONTROL-MOUNT Provisions for backsplash mounted disposer control. [Ref. QF601/View 2](#)
- 1 ea. Model Q-UNDERSHELF Undershelf, 22"W x 19" front-to-back, 16ga., type-304 stainless steel with type-A edge, 1-1/2"H rear turn-up, *welded/adjustable* set-up with type-B framework and sound deadening pads between all support channels and the shelf. Refer to fabrication details.
- 1 ea. Model Q-DRAWER-STACK Work drawers, (3) stacked, Type-B [Ref. QF603/View 1](#), 16ga., type-304 stainless steel frame and flush in fit type drawer faces with soft-close, self-closing roller bearing slides and removable inserts.
Housing: 16ga., type-304 stainless steel fully-enclosed drawer housing.
Refer to plans and elevations for specific sizing. Refer to fabrication details.
- 1 ea. Model Q-FEILD JOINT Hairline Field Joint Provision, Bolted in field by FSEC.

ITEM 18A - PREP SINK PRE-RINSE FAUCET WITH ULTRARINSE (1 REQ'D)

T&S Brass Model S-0133-U12-CR-B

EverSteel 8" wall mount mixing faucet with body, add-on faucet, 12" swing nozzle with stream regulator outlet, 18" riser, 44" flexible hose with heat resistant handle, 1.5 GPM 10 7/16" multiple tip swivel spray arm, 1.15 GPM blue spray valve, ceramic cartridges with check valves, lever handles, 1/2" NPT female inlets, 6" adjustable wall bracket, spray valve holder and overhead spring, stainless steel construction, Certified to ASME A112.18.1/CSA B125.1, NSF 61-Section 9 & NSF 372. 2019 DOE PRSV - Class II compliant.

ITEM 19 - 2HP DISPOSER (2 REQ'D)

Salvajor Model 200-SA-6-MRSS-LD

Disposer, Sink Assembly, 6-1/2" sink collar, 2 Hp motor, start/stop push button manual reversing with safety line disconnect MRSS-LD control, includes fixed nozzle, chrome plated vacuum breaker, solenoid valve, sink stopper & flow control, heat treated aluminum alloy housing, UL, CE, 208v/60/1-ph, 12.1 amps

- 2 ea. Model LSA8 Disposer support leg, for 3/4 HP - 2 HP disposers
- 2 ea. Model 980182 Disposer Throat Guard, drop-in, for 6-1/2" opening

ITEM 19.1 - VACUUM BREAKER ASSEMBLY (2 REQ'D)

T&S Brass Model B-0455

Vacuum Breaker Unit, 1/2" IPS piping, slip flanges for mounting on 45° surface, 6" between piping

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 20 - 42" AIR CURTAIN (1 REQ'D)

Berner Model SHD07-1042A

Sanitation Certified Series High Performance Air Curtain, 42" long, unheated, (1) 3/4 hp motor, for doors up to 7-feet high, specify exterior, indoor or exterior mounting, cULus, UL EPH Classified, MADE IN USA, 120v/60/1-ph

1 ea. Five year parts warranty (unheated units)

1 ea. If special freight fees are requested, (See below) all applicable fees will be added to the invoice; fees subject to change; contact factory for addition information.

1 ea. Model 9503SD025-PR-A Plunger/Roller Door Switch, NEMA 1, max. amp draw of 20 amps, 120-240v/1ph

1 ea. White powder coat exterior finish.

1 ea. Model WMP-WH Wall mounting plate, white (add suffix WMP-WH to desired length)

ITEM 21 - 36" X 18" 3-TIER WALL SHELF (3 REQ'D)

Cambro Model 3-Tier Wall Shelf Unit

Consisting of the following:

3 ea. Model EWST40000 - Wall Shelving Wall Track, 40"L, 6063 aluminum, NSF

3 ea. Model EWSSK1436V580 - Wall Shelving Shelf Kit, 14" x 36", includes (1) open shelf frame, (2) straight universal shelf brackets, vented shelf plates with antimicrobial protection, brushed graphite, NSF

6 ea. Model EWSSK1836V580 - Wall Shelving Shelf Kit, 18" x 36", includes (1) open shelf frame, (2) straight universal shelf brackets, vented shelf plates with antimicrobial protection, brushed graphite, NSF

3 ea. Model EWSR1836151 - Wall Shelving Full Shelf Rail Kits, 18" x 36" x 2", includes (1) front rail, (2) end rails, (1) bag of brackets, polypropylene, soft gray, NSF

ITEM 22 - 36" X 18" WALL GRID SHELF (2 REQ'D)

Cambro Model EWS36PREP110

Wall Shelving Prep Station Starter Kit, 18" x 36" x 30-1/4", includes: (1) 40" aluminum wall track, (2) 30" wall uprights, (2) 18" deep universal shelf brackets, (1) 18" x 36" vented shelf with antimicrobial shelf plates, (1) 18" x 36" hanging pegboard, 304 stainless steel accessories: (2) large wire baskets, (1) small shelf/lid holder, (1) cylinder and holder & (8) peg hooks, black, NSF

2 ea. Model EWSR1836151 - Wall Shelving Full Shelf Rail Kits, 18" x 36" x 2", includes (1) front rail, (2) end rails, (1) bag of brackets, polypropylene, soft gray, NSF

ITEM 23 - 36" X 18" WALL SHELF (1 REQ'D)

Approved Fabricator Model Q-3618WS

Shelf, wall-mounted, 36"W x 18" front-to-back x 12"H

Top: 16 ga., type-304 stainless steel top with type-A safety edge and 1-1/2"H rear turn-up.

Wall Brackets: 14 ga., type-304 stainless steel wall brackets.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 24 - 60" X 30" MOBILE WORKTABLE (1 REQ'D)

Approved Fabricator Model Q-6030MWT

Worktable, mobile, 60"W x 30" front-to-back x 36"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-A safety edge, and type-B framework with sound deadening pads between all support channels and the top. Mitered Corners.

Base: 16ga. type-304 stainless steel 1-5/8" dia. legs with 5" dia. casters (2 locking) and 1-5/8" dia. cross bracing with adjustable set-up. The base shall be removable from the top.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 25 - 20 QT PLANETARY MIXER (1 REQ'D)

Hobart Model HL200-1STD

100-120v/50/60/1ph; Bench type mixer; with bowl, beater, whip & spiral dough arm, US/EXP configuration - Legacy Planetary Mixer, Bench, 20 quart, (3) fixed speeds plus stir speed, gear-driven transmission, 15-minute Smart Timer, #12 taper hub, manual bowl lift, stainless steel bowl, aluminum "B" beater, stainless steel "D" wire whip, aluminum "ED" spiral dough arm, stainless steel bowl guard, 1/2 hp, cord with plug

1 ea. Warranty - 1-Year parts, labor & travel time during normal working hours within the USA

ITEM 25.1 - 24" X 24" EQUIPMENT STAND FOR MIXER (1 REQ'D)

Approved Fabricator Model Q-2424MES

Equipment stand, mobile, 24"W x 24" front-to-back x 20-1/4"H.

Top: 14ga., type-304 stainless steel top with type-A safety edge, and type-B framework with sound deadening pads between all support channels and the top.

Base: 16ga. type-304 stainless steel 1-5/8" dia. legs with 5" dia. casters (2 locking) and 1-5/8" dia. cross bracing with welded set-up. The base shall be removable from the top.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 25A - 36" X 12" MIXER WALL SHELF (1 REQ'D)

Approved Fabricator Model Q-3612MWS

Shelf, wall-mounted, 36"W x 12" front-to-back x 9-1/2"H

Top: 16 ga. type-304 stainless steel top with type-A safety edge and 1-1/2"H rear turn-up.

Wall Brackets: 14 ga. type-304 stainless steel wall brackets. Galley rail with utensil bar for double hooks

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 26 - 24" X 18" WALL SHELF (1 REQ'D)

Approved Fabricator Model Q-3618WS

Shelf, wall-mounted, 24"W x 18" front-to-back x 12"H

Top: 16 ga., type-304 stainless steel top with type-A safety edge and 1-1/2"H rear turn-up.

Wall Brackets: 14 ga., type-304 stainless steel wall brackets.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 27 - 228" X 60" EXHAUST HOOD WITH SUPPLY PLENUM (1 REQ'D)

Accurex Model XXEW-228.00-S

Hood, type-1, exhaust only, wall-canopy, 2-section(s), 228"W x 60" front-to-back x 24"H, mounted at 80" AFF to B.O. hood, 4,700 CFM exhaust, UL 710 listed without exhaust fire damper.

Exhaust collar(s): (1) 14"W x 16"D, (1) 14"W x 14"D, factory-mounted.

Construction: Match exposed hood material. Minimum 18ga., type-430 stainless steel, where exposed, standing seam method in accordance with the NFPA-96, IMC, and UMC. All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight. Include a Performance Enhancing Lip (PEL) to improve capture efficiency by turning air back into the hood. Include an integral 3" air space meeting NFPA-96 zero-clearance to combustibles requirements where adjacent to walls. Include top insulation meeting NFPA-96 zero-clearance to combustibles requirements. All unexposed interior surfaces shall be constructed of a minimum 18-gauge corrosion resistant steel.

Filter(s): Stainless steel Grease-X-Tractor filters, U.L. 1046 Classified and NSF Certified, 69% grease removal efficiency at 8 microns (51% from 3-10 microns) and static pressure drop of 0.7"-0.8" WC. Grease-X-Tractor filters shall direct exhaust airflow through individual cyclone chambers, utilizing centrifugal impingement grease extraction technology. The filter housing shall terminate in a pitched, full length grease trough that drains into removable grease container(s) meeting NFPA-96 requirements.

Light(s): (4) Round LED light fixtures, recessed, vapor proof, U.L. Listed, pre-wired to a junction box located at the top of the hood for field connection by Div. 26. Wiring shall conform to the NFPA-70 requirements.

- 1 ea. Model WARRANTY Accurex warrants to the original purchaser of the Accurex equipment that it will be free from defects in material and workmanship for a period of one year from the shipment date or one year from startup date, if appropriate proof of startup date is submitted, not to exceed eighteen (18) months from date of shipment. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid.
- 1 ea. Model ASP Supply plenum, air curtain, heat-only, front, 2-section(s), 228"W x 18" front-to-back x 6"H Supply collar(s): (2) 14"W x 16"D, factory-mounted. Construction: Match hood materials.
- 1 lt. Model BACKSPLASH-FLAT Backsplash panels, flat, on all building walls adjoining the hood between the bottom of the hood and the top of the building floor cove base. Maximum 48"W sections with trim strips between sections. Construction: Match exposed hood material.
- 1 ea. Model UTILITY-CABINET-HOOD Utility cabinet, hood-mounted, right side. Construction: Match exposed hood material.
- 1 ea. Model CEILING-ENCLOSURE Ceiling enclosure panels, Left, Front, and Right side(s) of hood, 18"H. 9'-0" Ceiling height. Construction: Match exposed hood material.
- 1 ea. Model PULL-STATION Manual pull station for fire suppression system.

ITEM 27A - ANSUL R-102, APPLIANCE SPECIFIC FIRE SUPPRESSION SYSTEM (1 REQ'D)

Accurex Model FSSC - PP - 19 - 2

Fire suppression system, appliance specific, Ansul R-102, pre-engineered, wet chemical, cartridge-operated, regulated pressure type with a fixed nozzle agent distribution network, UL-listed.

- 1 ea. Model FEILD HOOK-UP Labor Information: Hook-up of detection line and supply line is included. Surface mounting of the manual pull station in a pre-determined location is included. Charging and arming of the system is included. Permit included. Hood Puff Test Fee Included. [\(INCLUDE ALL NECESSARY TRAVEL\)](#).
- 1 ea. Model GAS-VALVE-MECHANICAL Gas valve, mechanical, 2" dia. [Gas valve is to be installed by Div. 22 near the hood.](#)

ITEM 27B - VARIABLE VOLUME CONTROLS (1 REQ'D)

Accurex Model XKC-DCV-S-11-2-1-0

Ventilation control system, variable volume, with (2) hood-mounted temperature sensors. Achieves energy savings required by multiple energy and green building standards, including ASHRAE 90.1, ASHRAE 189.1, IECC 2015 & California Title 24. [The FSEC shall coordinate configuration with fans provided by Div. 23.](#)

Construction: 18ga., type-304 stainless steel enclosure, UL-listed.

Fan(s) controlled: (1) exhaust fan(s), (1) supply fan(s).

Mounting location: Hood utility cabinet.

Configuration: Exhaust max and lights off during fire, power for shunt trip, temperature interlock, automatically starts fan(s) when cooking occurs in compliance with IMC, hood light control.

- 1 ea. Model TOUCHSCREEN Control, touchscreen interface, full-color. Include 50-ft of cable.

Mounting location: Remote ([installed on wall by Div. 26](#)).

ITEM 27C - UPBLAST EXHAUST FAN (1 BY DIV. 23)

Division 23 - Mechanical

Item number for scheduling purposes.

ITEM 27D - TEMPERED MAKE-UP AIR UNIT (1 BY DIV. 23)

Division 23 - Mechanical

Item number for scheduling purposes.

ITEM 28 - COMBI OVEN, GAS (1 REQ'D)

Vulcan Model CHEF-102G

Chef'sCombi 102G, Gas 10-level full-size (GN 2/1) capacity (10) 18" x 26" full-size sheet or (20) 12" x 20" steam pan. All-in-one multifunctional cooking equipment with customizable CombiOS interface, CombiClimateControl, AutoClimate, CombiGuide, MenuMix, & CombiCare. Advanced technologies for premium cooking results with powerful heating, humidity sensor-controlled climate regulation, high-performance dehumidification, controlled even heat distribution and humidifying function. Multi-point food probe, (5) wire racks, retractable sprayer, Ethernet & WiFi enabled, steam generator combi oven, 143,310 BTU, IPX5, cULus, NSF

- 1 ea. Model CHEFSCOMBI WARRANTY 2 years limited parts & labor warranty.
- 1 ea. Model CHEF-VCC Chef Assistance Program, a Vulcan Certified Chef conducts 4 hours/location specialized application training with personnel.
- 1 ea. Model INSTALL-C-COMBI Certified Installation: Hobart Service installation includes set in place, and all existing utility connections within 5 feet of unit ([INCLUDE ALL NECESSARY TRAVEL](#)).
- 1 ea. Model INSTALL-STARTUP Unit commissioned to assure operational start up by trained technician ([INCLUDE ALL NECESSARY TRAVEL](#)).
- 1 ea. Model CHEF-102G-208 (VICS102G-82) 208v/60/1-ph, 0.6kW, 3.0 amps
- 1 ea. Model CHEF-STAND62 Stainless steel tall 34" stand with (9) shelving levels for full size Chef'sCombi ovens 62 or 102
- 1 ea. Model CHEF-CAST2 Stand caster kit for full size combi ovens 62 or 102 (adds 3.94" overall height)
- 1 ea. Model CHEF-FLKIT Floor anchoring kit for stands for 6 & 10 level units
- 4 cs. Model CHEF-TAB Cleaner Tab - bucket (100) - for use inside the oven as part of the CombiCare cleaning cycles of quick, light, medium, & strong
- 4 cs. Model CHEF-STICK Care Stick - bucket (100) - for use in the front descaling box as part of the CombiCare descaling cycle
- 1 ea. Model VRACK-102 (5) Standard Grab-and-Go Racks for 102 sized Vulcan Combi, for use with 18" x 26" full sheet pans

ITEM 28.1 - 3/4" X 48" GAS QUICK DISCONNECT (1KT REQ'D)

T&S Brass Model HG-4D-60SK

Safe-T-Link Gas Connector Kit, 3/4" connection, 60" hose, stainless steel braiding with extruded coating, (1) Quick-Disconnect, (2) Swivelink fittings, (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 160,000 BTU / hr minium flow capacity

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 28A – WATER SOFTENER SYSTEM FOR COMBI OVEN (1 REQ'D)

Vulcan Model WS40-NOINSTALL

Water Softening System, 2,527 grains/lb capacity, 5 gallons regeneration volume, & salt alarm, holds 1 bag of salt, pricing DOES NOT include standard installation. INSTALLATION BY AUTHORIZED HOBART SERVICE OFFICE IS RECOMMENDED, for steam equipment, a CB15K-SYSTEM or CB30K-SYSTEM is required for treatment of Chlorine & Chloramines

ITEM 29 - 60" REFRIGERATED EQUIPMENT STAND (2 REQ'D)

Continental Refrigerator Model D60GN

Refrigerator Griddle Stand, one-section, (2) drawers, accommodates (3) 12" x 20" x 6", stainless steel top with drip guard marine edge, stainless steel exterior & interior, electronic control with digital display, hi-low alarm, self-contained refrigeration, R290 hydrocarbon refrigerant, 1/4 HP, 10' cord, cETLus, NSF, ENERGY STAR 115v/60/1-ph, 4.2 amps, cord, NEMA 5-15P.

- 2 ea. Warranty 7 year parts, labor, and compressor
- 2 ea. Condensing unit on the left
- 2 ea. 16 gauge stainless steel top (flat top or marine edge)
- 2 ea. Model 6-515 Caster Plate Assembly, 3" H (4-7/16" overall height), with brakes
- 2 ea. Integral heat shield

ITEM 30 - WATER FILTRATION SYSTEM FOR STEAM EQUIPMENT (1 REQ'D)

3M Purification Model SF165

3M Water Filtration Products Water Filtration System, with ScaleGARD HT scale control, 3 micron, 125 psi, 3.34 gpm flow rate, 35,000 gallons capacity, reduces sediment, chlorine taste & odor, for high and low-temperature applications, includes: (1) pressure gauge, (1) inlet shut-off valve and (1) outlet check valve, mounting bracket, (1) filter cartridge, & scale-feeding system, 3/4" NPT connections, NSF certified

- 1 kt. Model CARTPAK SF165 3M Water Filtration Products Replacement Cartridge, NSF certified

ITEM 31 - SPARE NO.**ITEM 32 - 24" 4-BURNER COUNTERTOP HOT PLATE, STEP-UP REAR (1 REQ'D)**

Vulcan Model VHP424U

Achiever Hotplate, gas, 24", countertop, (2) 30,000 BTU open burners, (2) 30,000 BTU step-up open burners, lift-off burner heads, protected standing pilots, cast iron top grates, infinite heat controls, stainless steel front with "Cool Bullnose", sides & backsplash, aluminized pull out crumb tray, 4" adjustable legs, 120,000 BTU, CSA, NSF

- 1 ea. 1 year limited parts & labor warranty.
- 1 ea. LP gas (2,000 ft ASL)

ITEM 32.1 - 3/4" X 48" GAS QUICK DISCONNECT (1 KT REQ'D)

T&S Brass Model HG-4D-60SK

Safe-T-Link Gas Connector Kit, 3/4" connection, 60" hose, stainless steel braiding with extruded coating, (1) Quick-Disconnect, (2) Swivelink fittings, (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 160,000 BTU / hr minium flow capacity

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 33 - 36" COUNTERTOP CHARBROILER (1 REQ'D)

Vulcan Model VTEC36

Infrared Charbroiler, gas, countertop, 36-1/2", (3) 22,000 BTU burner, manual control, piezo ignition, crumb tray, stainless steel cooking grids, sides, control panel, top trim, removable heat shield & backsplash, 4" adjustable legs, 66,000 BTU, CSA, NSF

- 1 ea. 1 year limited parts & labor warranty.
- 1 ea. LP gas (2,000 ft ASL)
- 1 ea. Model PLTRAIL-VTEC36 Plate Rail, 36" wide x 10" deep, stainless steel
- 1 ea. Standard grate, 14-rib, included
- 1 ea. Model EMITTER-VTEC Emitter Panel, 11" x 22" infrared radiant panel, set of (2)
- 1 ea. Model SCRAPER-VTEC Scraper for VTEC Charbroiler grid

ITEM 33.1 - 3/4" X 48" GAS QUICK DISCONNECT (1 KT REQ'D)

T&S Brass Model HG-4D-60SK

Safe-T-Link Gas Connector Kit, 3/4" connection, 60" hose, stainless steel braiding with extruded coating, (1) Quick-Disconnect, (2) Swivelink fittings, (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 160,000 BTU / hr minimum flow capacity

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 34 - 36" WALL-MOUNTED SALAMANDER BROILER (1 REQ'D)

Vulcan Model 36RB-P

Salamander Broiler, LP gas, 36" wide, 50,000 BTU heavy duty burner, dual control, (6) grid positions, removable pan, stainless steel front, top & sides, 3/4" gas connection & pressure regulator

- 1 ea. 1 year limited parts & labor warranty.
- 1 ea. Wall mount
- 1 ea. Model WALLMNT-CHRBKR Wall mount brackets, stainless steel (set) (stainless steel bottom panel required)
- 1 ea. Model BOTTOM-SLMNDR Stainless bottom panel (required with wall bracket)

ITEM 35 - 60" COUNTERTOP GRIDDLE WITH 2 CLAMSHELLS (1 REQ'D)

Vulcan Model MSA60

Heavy Duty Griddle, countertop, gas, 60" W x 24" D cooking surface, 1" thick polished steel griddle plate, embedded mechanical snap action thermostat every 12", millivolt pilot safety, manual ignition, low profile, stainless steel front, sides, front grease trough, 6 qt. grease can, 4" back & tapered side splashes, 4" adjustable legs, 135,000 BTU, CSA Star, CSA Flame, NSF

- 1 ea. 1 year limited parts & labor warranty.
- 1 ea. LP gas (2,000 ft ASL)
- 2 ea. Model VMCS-101 Rapid Recovery Griddle Clamshell Hood, electric, 10.4" W x 22.9" D x 9/16" thick composite plate, thermostatic control, 200-450° F, LED indicator lights, anodized aluminum arm, stainless steel front, top & sides, includes: (2) Teflon sheets & plate gap adjustment accessory, 3.6kW, 208v/50/60/1-ph, 17.3 amps, NSF, cCSAus
- 1 ea. Model GADJUST-ROTARY Rotary Gap Adjustment Bracket
- 1 ea. Model VMCSHEET-KIT10B (10) Non-Stick Release Sheets
- 1 ea. Model FRAME-VMCS60 Mounting Frame, 60", for 900RX, MSA, HEG(E), RRE(E) Mounting frame will be factory installed.
- 1 ea. Model PLTRAIL-60 Plate Rail, 60" wide x 10-5/8" deep, stainless steel

ITEM 35.1 - 3/4" X 48" GAS QUICK DISCONNECT (1 KT REQ'D)

T&S Brass Model HG-4D-60SK

Safe-T-Link Gas Connector Kit, 3/4" connection, 60" hose, stainless steel braiding with extruded coating, (1) Quick-Disconnect, (2) Swivelink fittings, (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 160,000 BTU / hr minimum flow capacity

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 36 - TRIPLE FRYER BATTERY WITH BUILT-IN FILTRATION (1 REQ'D)

Vulcan Model 3TR45AF

PowerFry3 Fryer, gas, high efficiency, 46-1/2" W, (3) battery, 45-50 lbs. capacity per vat, solid state analog knob control with melt cycles, ThreePass heat transfer system, electronic ignition, KleenScreen PLUS filtration system, twin baskets, stainless steel cabinet & fry tank, adjustable casters (2 swivel locking & 2 non-locking), 210,000 BTU, CSA, NSF, ENERGY STAR

- 1 ea. 1 year limited parts & labor warranty
- 1 ea. 10 year limited tank warranty
- 1 ea. LP gas (2,000 ft ASL)
- 3 ea. 120v/60/1-ph, 1/3 hp, 6.0 amps, NEMA 5-15P, for filter
- 3 ea. Model -HT Heat Trace, sold per vat
- 1 ea. Model OR Rear oil reclamation with lockable gate valve, for gas & electric batteries, priced one per battery system, factory installed
- 1 ea. Model VSPGARD-G/E Removable Splash Guard, 10", stainless steel, for 45-50 lbs. fryers, sold individually
- 3 ea. Model CRUMB-SCREEN Mesh Crumb Screen, 1/4"
- 1 ea. Model CONVKIT-2 Micro-Filtration Conversion Kit Contains Filter Envelopes, Stainless Steel Mesh Insert & Clip, for All Battery TR45 Fryers & Freestanding & Battery ER85 Fryers with Single Wide Filter Pan Located Under 1 Fryer. For 3 & 4 battery fryers, select both VFLANGD-FEET/4 & FLANGED-FEET/S
- 1 ea. Model VFLANGD-FEET/4 Set of (4) stainless steel adjustable flanged feet, 6-7-1/2"H, for all ranges.

ITEM 36.1 - 1-1/4" X 60" GAS QUICK DISCONNECT (1 KT REQ'D)

T&S Brass Model HG-4F-60SK

Safe-T-Link Gas Connector Kit, 1-1/4" connection, 60" hose, stainless steel braiding with extruded coating, (1) Quick-Disconnect, (2) Swivelink fittings, (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 475,000 BTU / hr minium flow capacity

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 37 - FRYER DUMP STATION WITH WARMER (1 REQ'D)

Vulcan Model FRYMATE VX15

Frymate Holding Station, free standing or add-on unit, 15-1/2" wide, 30-1/8" depth, stainless steel cabinet base, stainless steel top drain section with removable grease collector, set of 4 casters (2 locking), connecting strip & hardware included, (for 35-65 lb capacity gas or electric fryers)

- 1 ea. 1 year limited parts & labor warranty
- 1 ea. Model FOOD-WARMER-QS-PLATINUM (Quick Ship) ThermoGlo Food Warmer, 120v, for all Frymate models

ITEM 38 - 1-SEC. REACH IN FREEZER WITH 1 DOOR & 2 DRAWERS (1 REQ'D)

Continental Refrigerator Model 1FENSSHD/DB-MODIFIED

Extra-Wide Freezer, reach-in, 28-1/2"W, one-section, self-contained refrigeration, stainless steel exterior & interior, standard depth, half-height solid doors, cylinder locks, electronic control with digital display, unit can be adjusted to operate as low as -10°F, hi-low alarm, electric condensate evaporator, R290 Hydrocarbon refrigerant, 1/2 HP, cETLus, NSF, ENERGY STAR MODIFIED UNIT WITH DRAWERS IN BOTTOM, [Ref. QF202/View D](#) 115v/60/1-ph, 7.6 amps, cord, NEMA 5-15P.

- 1 ea. Warranty 7 year parts, labor, and compressor
- 1 ea. 5" Casters

ITEM 39 - 68" SANDWICH REFRIGERATED PREP TABLE (2 REQ'D)

Continental Refrigerator Model RA68N12

Refrigerated Base Sandwich Unit, 68"W, 300 series stainless steel top with (12) 1/6 size x 4" deep pans, stainless steel front & sides, galvanized steel case back, aluminum interior, 12" deep nylon cutting board, (2) full & (1) half height field rehingeable doors, electronic control, off cycle defrost, hot gas condensate evaporator, 1/3 HP, side-mounted refrigeration, R290 Hydrocarbon refrigerant, cETLus, NSF, 115v/60/1-ph, 7.0 amps, cord, NEMA 5-15P.

- 2 ea. Warranty 7 year parts, labor, and compressor
- 2 ea. Condensing unit on the left - moves pan opening to the right. [Ref. QF202/View D](#)
- 2 ea. Left door hinged left, right door hinged right, door above the compressor hinged right.
- 2 ea. Refrigerated drawer compartment, in lieu of door over the condensing unit compartment. [Ref. QF202/View D](#)
- 2 ea. Stainless steel interior
- 2 ea. Stainless steel finished back
- 2 ea. 5" Swivel Casters.

ITEM 40 - 2,200W MICROWAVE OVEN (1 REQ'D)

ACP Model RC22S2

Amana Commercial Microwave Oven, 1.0 cu. ft., 2200 watts, heavy volume, 4-stage cooking, (11) power levels, (100) memory settings, 60-minute max cooking time, LCD display, touch control, ADA-compliant Braille touch pads, audible end of cycle signal, side hinged door with tempered glass, LED lighted interior, USB port, sealed and recessed ceramic shelf, stainless steel exterior & interior, 208-240v/60/1-ph, 15.4 amps, 20 MCA, 3200 watts (total), NEMA 6-20P, ETL, ETL-Sanitation, cETLus, NSF, CSA, FDA, CE, UL

- 1 ea. 3 year full warranty.
- 1 ea. Model NB10 Basket, non-stick, 11-1/2"W x 13-1/2"D x 1"H, mesh bottom, for browning & crisping food, for MXP ovens

ITEM 41 - 46" X 36" WORKTABLE WITH OPEN-FRONT CABINET BASE (1 REQ'D)

Approved Fabricator Model Q-4636OFC

Worktable with open-front cabinet base, 46"W x 36" front-to-back x 42"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-A safety edge, 1-1/2"D x 6"H type-A backsplash, and type-B framework with sound deadening pads between all support channels and the top. [Cutout for Drop-in Unit #42](#)

Base: 16ga., type-304 stainless steel open-front cabinet base with 2"W mullions and lower shelf with type-B framework with sound deadening pads between all support channels and the lower shelf on 6"H legs with adjustable bullet feet.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

- 1 ea. Model Q-CUTOUT Provide a 42.125" x 42.375" cutout in the top for Drop-in Unit #42. Reference the buyout equipment specifications, plans and elevations.
- 1 ea. Model Q-CONTROL APRON Control Panel Apron for buyout equipment. Reference plans, elevations, and buyout equipment specifications.

ITEM 42 - HOT FOOD WELL UNIT, DROP-IN, ELECTRIC (1 REQ'D)

Hatco Model HWBI-3M

Drop-In Modular/Ganged Heated Well, with manifold drains, (3) full size pan capacity, insulated, top mounted, remote thermostat with separate power switch, stainless steel & Aluminized construction (standard watt), CE, cULus, UL EPH Classified, Made in USA, 208v/60/1, 3615w, 17.4 amps

- 1 ea. 1 year on-site parts & labor warranty, plus one additional year parts only warranty on the metal sheathed elements
- 1 ea. Single remote control configuration
- 1 ea. Model HWBI-CORD-3-4 Attached cord for HWBI-3, -4, single phase only
- 1 ea. Model HWBI-BOTTOM Copper Manifold drain with bottom exit, 1" NPT, field selectable left or right side (not available on HWBI-1 or 120v units)
- 1 ea. Model HWBI-EZ EZ-locking hardware for installation & remote thermostats with lighted power switches.
- 1 ea. Model BALLVALVE1INCH High Temperature NPT Ball Valve, 1", for units with drains & manifold
- 1 ea. 23-5/8" bezel depth.

ITEM 43 - SPARE NO.

ITEM 44 - 60" X 18" DISH CABINET (1 REQ'D)

Approved Fabricator Model Q6018DCM

Dish cabinet with open-front cabinet base, 60"W x 18" front-to-back x 40"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-A safety edge front and exposed sides, 90-degree turn-down edge on adjacent sides, 1"D x 4"H type-B backsplash, and type-B framework with sound deadening pads between all support channels and the top.

Base: 16ga., type-304 stainless steel open-front cabinet base with 2"W mullions and lower shelf with type-B framework with sound deadening pads between all support channels and the lower shelf on 6"H legs with adjustable bullet feet.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 45 - 60" X 18" DISH CABINET (1 REQ'D)

Approved Fabricator Model Q6018DC

Dish cabinet with open-front cabinet base, 60"W x 18" front-to-back x 40"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-A safety edge front and exposed sides, 90-degree turn-down edge on adjacent sides, 1"D x 4"H type-B backsplash, and type-B framework with sound deadening pads between all support channels and the top. (1) Mitered Corner [Ref. QF202/View F](#)

Base: 16ga., type-304 stainless steel open-front cabinet base with 2"W mullions and lower shelf with type-B framework with sound deadening pads between all support channels and the lower shelf on 6"H legs with adjustable bullet feet.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 46 - 60" X 18" DISH CABINET WITH SOUP WELLS (1 REQ'D)

Approved Fabricator Model Q6018DCSW

Dish cabinet with open-front cabinet base, 60"W x 18" front-to-back x 40"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-A safety edge front and exposed sides, 90-degree turn-down edge on adjacent sides, 1"D x 4"H type-B backsplash, and type-B framework with sound deadening pads between all support channels and the top. (1) Mitered Corner. [Ref. QF202/View F](#)

Base: 16ga., type-304 stainless steel open-front cabinet base with 2"W mullions and lower shelf with type-B framework with sound deadening pads between all support channels and the lower shelf on 6"H legs with adjustable bullet feet.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

- 3 ea. Model Q-CUTOUT Provide an 11.4" dia. cutout in the top for [Drop-in Unit #46.1](#). Reference the buyout equipment specifications, plans and elevations.

- 1 ea. Model Q-CONTROL APRON Control Panel Apron for buyout equipment. Reference plans, elevations, and buyout equipment specifications.

ITEM 46.1 - DROP-IN INDUCTION RETHERMALIZER (3 REQ'D)

Vollrath Model 741101D

Induction Rethermalizer, drop-in, dry operation, 11 quart, inset with hinged cover, (4) soup presets, stir indicator LED, solid state controls with locking function, temperature control in °F or °C, cabinet mount controls with leads, includes: induction ready inset, inset cover, mounting hardware & cord with NEMA 5-15P, 800 watts, 6.7 amps, 120v/60/1-ph, cULus, NSF, FCC (cover not NSF)

- 3 ea. Requires use of included Vollrath induction-ready inset - failure to use these insets may damage the unit & will void the warranty

- 3 ea. Model 88204 Inset, 11 quart, induction ready, for Mirage induction rethermalizer, NSF

- 3 ea. Model 47494 Contemporary Inset Cover, hinged, fits 11-1/4 quart inset, easy on/off lid, welded handle, condensation returns to inset, no friction fit tabs for easy installation & removal, dishwasher safe, stainless steel construction, imported

- 3 ea. Model 46739 Contemporary Style Serving Ladle, 4 oz., Overall Length 10.974 inches, stainless steel, capacity marked on back of handle in oz., ml, & cups, NSF

- 3 ea. Model 47492 Decorative Ring, for 11 qt. induction soup drop in units, 22 gauge stainless steel

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 47 - 84" X 24" DOUBLE PASS-THRU SHELF (2 REQ'D)

Approved Fabricator Model QPTS8424DBL

Pass-thru shelf, double, wall-mounted, 84"W x 24" front-to-back x 18"H.

Top: 14ga., type-304 stainless steel top with type-A safety edge and type-B framework with sound deadening pads between all support channels and the top.

Uprights: 16ga., type-304 1-5/8" dia. stainless steel posts.

Include wall brackets.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

3 ea. Model PRINTER SHELF 16ga. Stainless Steel Printer Shelf, 8"W x 16"D deck, mounts under overself

ITEM 48 - 66" DUAL HEAT LAMP WITH LIGHTS (1 REQ'D)

Vollrath Model 72726

Heat Strip, 66" Hard Wired, Medium Wattage, one-year parts & labor warranty, additional one-year parts warranty on cal-rod element, cULus, NSF, Made in USA (Refer to vollrathfoodservice.com for full warranty policy)

- 1 ea. Dual with lights (element wattage 3030 - six 40 watt shatterproof bulbs included, lighted section total amp 2.1)
- 1 ea. 120/240V - #33
- 1 ea. #9 On board toggle - front wire
- 1 ea. NOTE: Hard wire units are supplied with chain mounting tabs
- 2 st. Model 44545 Top Surface Mounting Brackets, 1" (2 per set, (2) sets required for duals)
- 1 st. Model 1789766 kool-Touch Trim Set, 66"W, (2 per set) (1 set covers both sides of 66"W units)
- 1 ea. 1 year parts & labor warranty
- 1 ea. 1 year additional parts warranty on cal-rod element

ITEM 49 - 60" DUAL HEAT LAMP WITH LIGHTS (1 REQ'D)

Vollrath Model 72723

Heat Strip, 60" Hard Wired, Medium Wattage, one-year parts & labor warranty, additional one-year parts warranty on cal-rod element, cULus, NSF, Made in USA (Refer to vollrathfoodservice.com for full warranty policy)

- 1 ea. Dual with lights (element wattage 2760 - six 40 watt shatterproof bulbs included, lighted section total amp 2.1)
- 1 ea. 120/240V - #33
- 1 ea. #9 On board toggle - front wire
- 1 ea. NOTE: Hard wire units are supplied with chain mounting tabs
- 2 st. Model 44545 Top Surface Mounting Brackets, 1" (2 per set, (2) sets required for duals)
- 1 st. Model 1789760 kool-Touch Trim Set, 60"W, (2 per set) (1 set covers both sides of 60"W units)
- 1 ea. 1 year parts & labor warranty
- 1 ea. 1 year additional parts warranty on cal-rod element

ITEM 50 - 582LB ICE MACHINE WITH 42" BIN (1 REQ'D)

Scotsman Model MC0630SAX-1

Ice Maker, cube style, air-cooled, self-contained condenser, production capacity up to 582 lb at 70°/50° (479 lb AHRI certified at 90°/70°), small cube size, ICELINQ mobile app, Bluetooth connectivity, preservation mode, external bin full indicator, AutoAlert indicating lights, WaterSense adjustable purge control, one-touch cleaning, harvest assist, front facing removable air filter, unit specific QR code, stainless steel finish, AgION antimicrobial protection, R290 refrigerant, 115v/60/1-ph, cETLus, NSF, engineered and assembled in USA

- 1 ea. 3 yr. parts & labor warranty, std.
- 1 ea. 5 year parts & labor warranties on evaporator
- 1 ea. 5 year parts on compressor & condenser
- 1 ea. Model KPAS Kit, Prodigy Advanced Sustainability, includes KSBU-N, & KVS
- 1 ea. Model XR-30 XSafe Sanitation System, for modular cube ice machines, field install only, external device mounted on top of ice machine, includes installation kit, power cord, NEMA 1-15P plug, cULus, NSF, CE
- 1 ea. Model B842S Ice Bin, top-hinged front-opening door, 778 lbs. application capacity, for top-mounted ice maker, 42" width, metallic finish exterior, toolless removable baffle, polyurethane insulation, polyethylene liner, includes 6" legs, NSF, engineered and assembled in USA
- 1 ea. 3 yr. parts & labor warranty, std.
- 1 ea. Model KBT29 Bin Top Kit, for 30" modular cubers on B842S, BH801 bin
- 1 st. Model KLP8S Leg Kit, 6", stainless steel, for Bx22, Bx30, B842 & B948 bins, HD dispensers, CU1526, CU2026, CU3030, AFE, UC, UF & UN units
- 1 ea. Model KHOLDER Ice Scoop Holder, fits all modular ice storage bins, stainless steel

ITEM 51 - ICE MACHINE WATER FILTRATION SYSTEM (1 REQ'D)

3M Purification Model ICE125-S

Water Filter System, with gauge, 17"H x 4.5"D, valve-in-head, high turbidity water, single vessel, 1/4-turn shut off valve, max pressure of 125 psi at 100°F, 1 micron, 1.5 gpm flow rate, 10,000 gallons capacity, for sediment, chlorine taste & odor, scale, includes: (1) integral mounting bracket and (1) o-ring seal cartridge filter, 3/8" FNPT connections, NSF certified

- 1 ea. Model HF25-S Replacement Cartridge, standard length, 1 micron, 1.5 gpm flow rate, 10,000 gallons capacity, reduces sediment, chlorine taste & odor, scale inhibitor for ICE125-S, NSF certified

ITEM 52 - WALL-MOUNTED LETTUCE CRISPER (1 REQ'D)

Silver King Model SKDL25-ESUS2

Lettuce Crisper/Dispenser, 25.6"W, adjustable temperature control, side mounted on/off power switch, field reversible door, removable bin with center divider, includes wall mount kit, stainless steel interior, stainless steel & galvanized exterior, top-mounted self-contained refrigeration, R290 Hydrocarbon refrigerant, 115v/60/1-ph, 3.0 amps, NEMA 5-15P

- 1 ea. Contact warranty department at 800-328-3329 - prompt 2 - MFT Marmon Link

ITEM 53 - SPARE NO.**ITEM 54 - DROP-IN SODA AND ICE DISPENSER (1 BY VENDOR)**

By Vendor – Not In Contract

Item number for scheduling purposes.

ITEM 55 - ICED TEA BREWER (1 REQ'D)

BUNN Model 36700.0009

Iced Tea Brewer, 3-gallon capacity single brewer, 16.3 gallon/hour, SplashGard funnel, adjustable steep time, (dispensers sold separately), 120v/60/1-ph, 1730w, 14.4amps, NEMA 5-15P, cord attached, UL, NSF

- 1 ea. Prices include applicable tariffs
- 1 ea. Model 34100.0002 34100.0002 TDO-4 Iced Tea/Coffee Dispenser, cylinder style, 4 gallon capacity (15.1 litres), sump dispense valve, oval shape brew-through plastic lid, faucet handles are labeled sweetened & unsweetened, side handles, NSF
- 1 ea. Model 03021.0004 Funnel Assembly, tea, smoke (TU3/T3)

ITEM 55A - ICED TEA AND COFFEE BREWER WATER FILTRATION SYSTEM (1 REQ'D)

3M Purification Model DP190

Dual Port Manifold System, with shut-off valve, 0.2 micron, 5 gpm flow rate, 54,000 gallons capacity, reduces bacteria, sediment, chlorine taste & odor, cyst, scale, for multi-equipment combination applications, includes: (1) 5613801 Cartpak, [(1) HF90 & (1) HF8-S], NSF certified

- 1 kt. Model CARTPAK DP190 Replacement Cartridge Kit, 0.2 micron, 54,000 gallons capacity, reduces bacteria, sediment, chlorine taste & odor, cyst, scale, includes: (1) 5613503 and (1) 5582113 cartridges, NSF certified

ITEM 56 - DUAL COFFEE BREWER (1 REQ'D)

BUNN Model 33500.0042

DUAL SH DBC Dual Soft Heat Coffee Brewer, with Smart Funnel, holds (2) 1-1/2 gallon Soft Heat servers (servers sold separately), brews up to 19.3 gallons per hour, 1/2-gallon, 1-gallon or 1-1/2-gallon batches, coffee and flavor profile storage, adjustable water volume, bypass percentage, pulse brew, 120/208-240v/60/1-ph, 23.9-29.1 amps, 4980-6800 watts NSF, UL

- 1 ea. Prices include applicable tariffs
- 2 ea. Model 27850.0001 Soft Heat Coffee Server, 1.5 gallon per hour capacity, portable, LED indicator, server supply controlled heat, brew-through lid, top handles, UL, NSF
- 1 ea. Model 27150.0000 27150.0000 Drip Tray Kit, black decor, for use with Dual & SH satellite coffee systems

ITEM 57 - 96" X 30" BEVERAGE COUNTER (1 REQ'D)

Approved Fabricator Model Q-9630BC

Worktable with open-front & (1) hinged-door cabinet base, 96"W x 30" front-to-back x 42"H, 36" work height.

Top: 14ga., type-304 stainless steel top with type-A safety edge, 1-1/2"D x 6"H type-A backsplash, and type-B framework with sound deadening pads between all support channels and the top. (1) Single Inlet faucet hole, Centered on sink.

Base: 16ga., type-304 stainless steel open-front & hinged-door cabinet base with 2"W mullions, glass rack slide, and lower shelf with type-B framework with sound deadening pads between all support channels and the lower shelf on 6"H legs with adjustable bullet feet.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

- 1 ea. Model Q-CUTOUT Provide a 12" x 12" cutout in the back panel for plumbing. Reference the plans and elevations.
- 1 ea. Model Q-SINK-POT 14ga., weld-in, type-304 stainless steel 16"W x 24" front-to-back x 12" deep weld-in undermount sinks with rear overflow cutouts, 3-1/2" drain openings. Include cutout, welding, and polishing.
- 1 ea. Model Q-QUICK-DRAIN Urn trough, weld-in, 14ga., type-304 stainless steel construction with scrap basket. Include cutout, welding, and polishing.

ITEM 57.1 - PANTRY FAUCET (1 REQ'D)

T&S Brass Model B-0202-CR

Pantry Faucet, double, single hole base, 4" spreader, 6" swing nozzle (059X), quarter-turn Ceramic cartridges, low lead, ADA Compliant

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 58 - 24" X 12" WALL-MOUNTED SHELF (1 REQ'D)

Approved Fabricator Model Q-2412WS

Shelf, wall-mounted, 24"W x 12" front-to-back x 9-1/2"H

Top: 16 ga. type-304 stainless steel top with type-A safety edge and 1-1/2"H rear turn-up.

Wall Brackets: 14 ga. type-304 stainless steel wall brackets.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

ITEM 59 - MOP SINK CABINET (1 REQ'D)

John Boos Model PBMC-224884

Mat Wash Cabinet, 48"W x 22-1/2"D x 84"H overall size, enclosed cabinet with open back for plumbing, (2) lockable louvered swinging doors, includes: 44" x 16" x 6" deep sink with drain, overhead shelf, rear mounted mat holder, side mounted mop holder with (2) locking cams, service faucet and 120" hose, 18/300 stainless steel

ITEM 60 - 48" X 24" MOBILE DRYING RACK (1 REQ'D)

Cambro Model CPMU244875PDPKG

Mobile Angled Drying Rack Cart, 24"W x 48"L x 75-1/4"H, includes: (4) boxes of drying cradles for (4) levels, (8) mobile traverses, (2) pre-assembled post kits, (4) premium swivel casters with total locking brake, max. weight bearing 900 lbs., speckled gray, NSF listed components, Made in USA

ITEM 61 - BAG IN BOX (1 BY VENDOR)

By Vendor – Not In Contract

Item number for scheduling purposes.

ITEM 62 - RECESSED EYE WASH STATION (1 REQ'D)

T&S Brass Model EW-7656WC

Eyewash Unit, recessed, wall mounted, 32"H x 14"W x 5"D, single valve with strainer, 4.2 gpm flow control, polished chrome-plated brass valve, stainless steel housing, 1/2" NPT inlet, 2" NPT waste outlet, cCSAus

ITEM 63 - HOSE REEL (1 REQ'D)

T&S Brass Model 5HR-242-01XE1

Equip Hose Reel Assembly, open, dual temperature, 3/8" x 50 ft. hose, wall mount mixing faucet with 8" adjustable centers, 40" riser, quarter-turn ceramic cartridges, lever handles with color coded indexes, continuous pressure vacuum breaker, 1/2" NPT x 3/6" flexible water hose connector with stainless steel quick disconnect, high flow spray valve, with ratcheting system & adjustable hose bumper, (2) 2-3/8" wall brackets, epoxy coated steel hose reel, polished chrome-plated brass faucet body, 1/2" NPT female inlets, certified to ASSE 1056

1 ea. 1 year limited warranty.

1 ea. Model G019430-45 Universal Hose Reel Swing Bracket, fits 1/2" & 3/8" hose reels, includes mounting hardware, stainless steel

ITEM 64 - SPARE NO.**ITEM 65 - 120" X 30-1/2" CLEAN DISHTABLE WITH POT SINKS (1 REQ'D)**

Approved Fabricator Model Q-120CDWPS

Clean dishtable with pot sinks, straight, 120"W x 30-1/2" front-to-back x 44"H, 34" work height sloped toward dishmachine. Top: 14ga., type-304 stainless steel top with type-B raised rolled edge, 2"D x 10"H backsplash with (3) set(s) of 8' O.C. faucet holes, (3) Type-L Warewashing sink bowl [Ref. QF603/View 3](#), and type-B framework with sound deadening pads between all support channels and the top. Size the table opening for the specified dishmachine.

Base: 16ga. type-304 stainless steel 1-5/8" dia. legs with adjustable bullet feet and 1-5/8" dia. cross bracing with welded set-up. The base shall be removable from the top.

Refer to plans and elevations for specific sizing. Refer to fabrication details.

1 ea. Model Q-TUB-SKIRT Tub skirt, full 16ga., type-304 stainless steel construction to enclose sink bowl(s). Refer to plans and elevations for specific sizing. Refer to fabrication details.

1 ea. Model Q-UNDERSHELF Undershelf, 22"W x 19" front-to-back, 16ga., type-304 stainless steel with type-A edge, 1-1/2"H rear turn-up, welded set-up with type-B framework and sound deadening pads between all support channels and the shelf. Refer to fabrication details.

ITEM 65.1 - MODULAR WASTE DRAIN WITH OVERFLOW (3 REQ'D)

T&S Brass Model B-3992-01-3X

Modular Waste Drain Valve, with pull handle, 3-1/2" sink opening, 2" NPT male / 1-1/2" female outlet, overflow tube with head assembly, 3" handle extension

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 65.2 - WALL / SPLASH MOUNT FAUCET (1 REQ'D)

T&S Brass Model B-0290

Sink Mixing Faucet, wall mount, 8" adjustable centers, 12" Big-Flo swing nozzle with plain end outlet, 4-arm kitchen handles with color coded indexes, 00LL street elbows with 3/4" female NPT inlets, ADA Compliant

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 66 - WAREWASHING PRE-RINSE WITH ADD-ON FAUCET (2 REQ'D)

T&S Brass Model B-0133-12CRBJST

Pre-Rinse Unit, 8" wall mount, add on faucet 12" swivel nozzle, Ceramic cartridges with check valves, lever handles, 18" riser, 44" flexible stainless steel hose, 1.07 GPM, accessory fitting, wall bracket, low lead, NSF (B-0230-K)

ITEM 67 - SPARE NO.**ITEM 68 - DETERGENT DISPENSER (3 BY VENDOR)**

By Vender – Not in Contract

Item number for scheduling purposes.

ITEM 69 - 42" SOLID SLANTED SORTING SHELF (1 REQ'D)

Approved Fabricator Model Q-SORTING-SHELF-SOLID

Shelf, sorting, wall-mounted, slanted, solid, 42"W x 15-1/2"D x 15-1/2"H, full 16ga., type-304 stainless steel construction with welded set-up. Include drip tube on one end.

ITEM 70 - MOBILE SOAKING SINK (1 REQ'D)

Approved Fabricator Model Q-SOAKING SINK

Soak Sink, mobile, 27"W x 27"D x 21-3/4"H overall size.

Top: 14 ga. Stainless Steel. (1) 20"W x 20"W x 8" deep compartment, 3-1/2" drain opening, no drip edge,

Base: 16 ga. stainless steel construction, 5" casters with (2) locks

ITEM 71 - DOOR-TYPE DISHMACHINE (1 REQ'D)

Hobart Model AM16-ASR-2

Dishwashing Machine, door type, automatic soil removal (ASR) high temp sanitizing, 208-240/60/3, 52 racks/hour, straight-thru or corner installation, user-friendly smart touchscreen controls, Wi-Fi connectivity with SmartConnect app, Complete Delime with Delime Notification, Auto Dispensing, and Booster Guard, Sense-A-Temp booster, electric tank heat, X-shaped wash arms, scrap screen and basket, door actuated start, stainless steel tank, tank shelf, chamber, trim panels, frame & feet, pumped drain air gap, drain water tempering, cULus, NSF, ENERGY STAR.

- 1 ea. Factory Startup [\(INCLUDE ALL NECESSARY TRAVEL\)](#).
- 1 ea. Warranty - 1-Year parts, labor & travel time during normal working hours within the USA
- 1 ea. Model ASR-LEFT-AM16 ASR Left Hand Conversion Kit Installation – to relocate the ASR from the right to left side of the unit. Must be installed by Hobart Service. Accessory installation of this item only, final electrical or plumbing connections by Div. 22/Div. 23 [\(INCLUDE ALL NECESSARY TRAVEL\)](#).
- 1 ea. Model ASR-INSTALL-AM16 Accessory installation of this item only, final electrical or plumbing connections by Div. 22/Div. 23 [\(INCLUDE ALL NECESSARY TRAVEL\)](#).
- 1 ea. Model CORNER-INST-AM16 Splash shield for corner installations. Includes splash panel and sheet pan adaptor.
- 1 ea. Model RAPID-FILL2-AM16 Rapid Fill Kit Dual Valve For faster filling
- 1 ea. Model ACC-INSTALL-RAPID16 Accessory installation of this item only, final electrical or plumbing connections by Div. 22/ Div. 23 [\(INCLUDE ALL NECESSARY TRAVEL\)](#).
- 1 ea. Model WTRHAMARREST-AM16 Water Hammer Arrestor –Includes 3/4" brass pressure regulator, pressure gauge, shock arrestor and garden hose adapter.

ITEM 71.1 - WATER SOFTENER CONDITIONER (1 REQ'D)

Hobart Model WS40

Water Softening System, 2,527 grains/lb capacity, 5 gallons regeneration volume, & salt alarm, holds 1 bag of salt. Must be installed by Hobart Service. Accessory installation of this item only, final electrical or plumbing connections by Div. 22/Div. 23 ([INCLUDE ALL NECESSARY TRAVEL](#)).

This item is an accessory to the item above and is not tagged or scheduled.

ITEM 72 - 48" X 48" CONDENSATE HOOD (1 REQ'D)

Accurex Model XD1 - 48.00 - S

Hood, type-2, exhaust only, wall-canopy, 48"W x 48" front-to-back x 24"H, mounted at 80" AFF to B.O. hood, 600 CFM exhaust.

Exhaust collar(s): (1) 6"W x 9"D, factory mounted.

Construction: Minimum 18ga., type-304 stainless steel.

- 1 ea. Model WARRANTY Accurex warrants to the original purchaser of the Accurex equipment that it will be free from defects in material and workmanship for a period of one year from the shipment date or one year from startup date, if appropriate proof of startup date is submitted, not to exceed eighteen (18) months from date of shipment. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid.
- 1 ea. Model CEILING-ENCLOSURE Ceiling enclosure panels, Left, Front, and Right side(s) of hood, 6"H.
Construction: Match exposed hood material.

ITEM 72A - UPBLAST EXHAUST FAN (1 BY DIV. 23)

Division 23 - Mechanical

Item number for scheduling purposes.

ITEM 73 - 92" X 84" L-SHAPED SOILED DISHTABLE (1 REQ'D)

Approved Fabricator Model Q-9284LSDT

Soiled dishtable, L-shaped, 92"W x 84"L x 30-1/2" front-to-back x 44"H, 34" work height sloped toward dishmachine.

Top: 14ga., type-304 stainless steel top with type-B raised rolled edge, 2"D x 10"H backsplash with (1) set of 8" O.C. faucet holes, and type-B framework with sound deadening pads between all support channels and the top. Size the table opening for the specified dishmachine.

Base: 16ga. type-304 stainless steel 1-5/8" dia. legs with adjustable bullet feet and 1-5/8" dia. cross bracing with welded set-up. The base shall be removable from the top.

Refer to plans and elevations for specific sizing. Refer to fabrication details. [Ref, QF202/View B & C](#)

- 1 ea. Model Q-SINK-POT 14ga., type-304 stainless steel type-A weld-in undermount sinks [Ref. QF603/View 3](#) with rear overflow cutouts, 3-1/2" drain openings. Include cutout, welding, and polishing.
- 1 ea. Model Q-SORTING-SHELF-DOUBLE Shelf, sorting, table-mounted, slanted, double-sided, tubular, 92"W x 30-1/2"D x 32"H, full 16ga., type-304 stainless steel construction with 1-5/8" dia. uprights, 1-5/8" dia. tubing, and welded set-up. Table mount both ends and affix to adjacent wall(s).

ITEM 74 - 32 GALLON BRUTE TRASH CAN (2 BY OWNER)

Not Included in Contract

Item number for scheduling purposes.

ITEM 75 - 60" LIQUOR BOTTLE DISPLAY (1 REQ'D)

Glastender, Inc. Model LLD3-60

Lighted Liquor Display, 3-tier, 60"wide x 12"D x 12"H, opaque acrylic step covers, LED light strips, 100 - 240 VAC, 50/60 Hz, 1-ph (Made to order, not returnable)

- 1 ea. 1 year parts & labor warranty
- 1 ea. Type B - NEMA 5-15P
- 1 ea. Power cord location, Left
- 1 ea. Exterior finish, Black vinyl-clad
- 1 ea. LED lighting, Warm white

ITEM 76 - 60" BACK BAR DRY STORAGE (1 REQ'D)

Glastender, Inc. Model DS60

Back Bar Dry Storage Cabinet, three-section, 60"W, non-refrigerated, (3) solid hinged doors, (2) adjustable shelves per section, galvanized steel interior, galvanized steel back, stainless steel bullet feet, ETL-Sanitation (Made to order, not returnable)

- 1 ea. 1 year parts & labor warranty
- 1 ea. Door style, first: Black vinyl-clad
- 1 ea. Signature handle
- 1 ea. Door hinge location: Left
- 1 ea. Door style, second: Black vinyl-clad
- 1 ea. Signature handle
- 1 ea. Door hinge location: Left
- 1 ea. Door style, third: Black vinyl-clad
- 1 ea. Signature handle
- 1 ea. Door hinge location: Left
- 1 ea. Stainless steel top
- 1 ea. Left side finish: Black vinyl-clad
- 1 ea. Right side finish: Black vinyl-clad
- 1 ea. No legs or casters

ITEM 77 - 36" LIQUOR BOTTLE DISPLAY (1 REQ'D)

Glastender, Inc. Model LLD3-36

Lighted Liquor Display, 3-tier, 36"wide x 12"D x 12"H, opaque acrylic step covers, LED light strips, 100 - 240 VAC, 50/60 Hz, 1-ph (Made to order, not returnable)

- 1 ea. 1 year parts & labor warranty
- 1 ea. Type B - NEMA 5-15P
- 1 ea. Power cord location, Left
- 1 ea. Exterior finish, Black vinyl-clad
- 1 ea. LED lighting, Warm white

ITEM 78 - 40" BACK BAR DRY STORAGE (1 REQ'D)

Glastender, Inc. Model DS40

Back Bar Dry Storage Cabinet, two-section, 40"W, non-refrigerated, (2) solid hinged doors, (2) adjustable shelves per section, galvanized steel interior, galvanized steel back, stainless steel bullet feet, ETL-Sanitation (Made to order, not returnable)

- 1 ea. 1 year parts & labor warranty
- 1 ea. Door style, first: Black vinyl-clad
- 1 ea. Door hinge location: Left
- 1 ea. Signature handle
- 1 ea. Door style, second: Black vinyl-clad
- 1 ea. Door hinge location: Right
- 1 ea. Signature handle
- 1 ea. Stainless steel top
- 1 ea. Left side finish: Black vinyl-clad
- 1 ea. Right side finish: Black vinyl-clad
- 1 ea. No legs or casters

ITEM 79 - 24" UNDERBAR POS WORK CENTER (2 REQ'D)

Glastender, Inc. Model PCB-24

POS Cabinet, 24"W x 24"D, 26"H work surface with cord access hole, louvered hinged door with integral handle & lock, stainless steel construction, stainless steel legs with adjustable bullet feet, ETL-Sanitation

- 2 ea. Aligns with 4" High Backsplash, in lieu of standard
- 2 ea. Model RSP Side Splash, right end, for POS cabinets

ITEM 80 - 24" UNDERBAR BOTTLE STORAGE (2 REQ'D)

Glastender, Inc. Model LDA-24S

Underbar Liquor Steps, free standing, 24"W x 24"D (aligns with 19" deep units with single speed rail), (4) steps, extra-wide rear step, includes clear lift-off liquor-identification cover, stainless steel construction, stainless steel legs with adjustable bullet feet, ETL-Sanitation

- 2 ea. 1 year parts & labor warranty
- 2 ea. 4" High Backsplash, in lieu of standard

ITEM 81 - MODULAR BAR SYSTEM (28 FT REQ'D)

Glastender, Inc. Model MD

Modular Bar Die, 16 gauge galvanized steel structure with 300 series stainless steel bartender side finishing, GFI outlets built into bar die wall based on customer preferences (wiring not provided), LED lights built into bar die wall above underbar equipment (wiring not provided), built in chaseways for plumbing, electrical, soda, & beer lines (priced per foot)

ITEM 82 - 12 OZ. POPCORN POPPER (1 REQ'D)

Gold Medal Products Model 2014

Gay 90's Whiz Bang Popper, electric, countertop, 12/14 oz. kettle capacity, aluminum frame, stainless steel kettle, heated corn deck, etched glass, antique gold finishes, 1430 watts, 120v/60/1-ph, cord, NEMA 5-15P, cULus, NSF

- 1 ea. 2 year parts & 6 months labor warranty, standard
- 1 ea. Gold Metal Model 2015 - Popcorn Cart, 20" x 28", (2) spoke wheels, red exterior

ITEM 83 - 12" UNDERBAR BLENDER STATION (1 REQ'D)

Glastender, Inc. Model BSA-12

Underbar Blender Station, freestanding with dump sink, 12"W x 24"D, 6" deep sink bowl, splash mount faucet with swing spout (low lead compliant), lift-out plastic perforated sink strainer, 9"D blender shelf, power cord hole with grommet on front skirt, junction box for duplex outlet mounted underneath blender shelf (outlet not included), stainless steel construction, stainless steel legs with adjustable bullet feet, ETL-Sanitation

- 1 ea. 1 year parts & labor warranty
- 1 ea. 4" High Backsplash, in lieu of standard
- 1 ea. Aerator, faucet, 2.0 GPM
- 1 ea. Model FOF-B Convert backsplash-mounted faucet to foot operated
- 1 ea. Model LS15-F Splash, left end, 15" deep, BSA model

ITEM 84 - 36" UNDERBAR ICE BIN (1 REQ'D)

Glastender, Inc. Model IBA-36-CP10-ED

Extra Deep Underbar Ice Bin, with 10-circuit cold plate, 36"W x 19"D, 139 lbs. ice capacity, 14-1/2" deep bin liner, PVC breaker strip around ice bin liner, includes sliding stainless steel bin cover, stainless steel construction, stainless steel legs with adjustable stainless steel bullet feet, ETL-Sanitation (Made to order, not returnable)

- 1 ea. 1 year parts & labor warranty
- 1 ea. 4" High Backsplash, in lieu of standard
- 2 ea. Model BW3 Bottle Well, 3-bottle, for 19" deep ice bins, ABS plastic molded, placement on left or right of ice bin, ledge on one side to accommodate sliding ice bin cover, for use with potable ice, black
- 1 ea. Model SSR-36 Single Speed Rail, 36"W, open step-and-rail design, PVC sound-deadening covers, clear snap-on liquor identification label cover, field installed, stainless steel construction, ETL-Sanitation

ITEM 85 - 4" UNDERBAR SODA GUN HOLDER (1 REQ'D)

Glastender, Inc. Model SHA-4-ED

Extra Deep Underbar Soda Gun Holder, 4"W x 19"D x 25"H, built-in holder for soda gun, includes integral drip pan, removable cover for access to soda gun manifold (soda gun not included), must mount to at least one other piece of underbar equipment (no provision for leg mounting), stainless steel construction, ETL-Sanitation

- 1 ea. 4" High Backsplash, in lieu of standard

ITEM 86 - 24" UNDERBAR DRAINBOARD (1 REQ'D)

Glastender, Inc. Model DBGR-24-RS

Underbar Glass Rack Storage Unit, drainboard top, 24"W x 24"D, open front base, holds (2) 20" x 20" glass racks, roll-out intermediate shelf & roll-out bottom shelf, drain pan with removable perforated insert & 1/2" drain, stainless steel construction, stainless steel legs with adjustable bullet feet, ETL-Sanitation

1 ea. 4" High Backsplash, in lieu of standard

ITEM 87 - 12" UNDERBAR HAND SINK (1 REQ'D)

Glastender, Inc. Model HSB-12

Underbar Hand Sink Unit, free standing, 12"W x 24"D, 9-1/4" wide x 11-1/2" front-to-back x 6" deep bowl, deck mount faucet (low lead compliant), stainless steel construction, legs with adjustable bullet feet, ETL-Sanitation, NSF/ANSI 61, Annex G

1 ea. 1 year parts & labor warranty

1 ea. 4" High Backsplash, in lieu of standard

1 ea. Model KOF-D Convert deck-mounted faucet to knee operated

1 ea. Model LSB-D Splash, left end, 24" deep

1 ea. Model RSB-D Splash, right end, 24" deep

1 ea. Aerator, faucet, 2.0 GPM

ITEM 88 - 15" UNDERBAR WASTE BIN, RIGHT (1 REQ'D)

Glastender, Inc. Model DWB-15R

Underbar Dry Waste Unit, 15"W x 24"D, 6" diameter waste chute, removable top, accommodates Rubbermaid® Slim Jim™ trash receptacle (not included), stainless steel construction, (2) stainless steel legs with adjustable bullet feet on right (designed to mount to (1) adjacent underbar unit), ETL-Sanitation

1 ea. 1 year parts & labor warranty

1 ea. 4" High Backsplash, in lieu of standard

ITEM 89 - 15" UNDERBAR WASTE BIN, LEFT (1 REQ'D)

Glastender, Inc. Model DWB-15L

Underbar Dry Waste Unit, 15"W x 24"D, 6" diameter waste chute, removable top, accommodates Rubbermaid® Slim Jim™ trash receptacle (not included), stainless steel construction, (2) stainless steel legs with adjustable bullet feet on left (designed to mount to (1) adjacent underbar unit), ETL-Sanitation

1 ea. 1 year parts & labor warranty

1 ea. 4" High Backsplash, in lieu of standard

ITEM 90-92 - SPARE NO.**ITEM 93 - 45° UNDERBAR DRAINBOARD (2 REQ'D)**

Glastender, Inc. Model CIWB-45

Underbar Inside Wedge Corner Drainboard, with removable perforated insert, 45° angle, 24" deep, stainless steel construction, no legs (mounts between two adjacent underbar pieces), ETL-Sanitation (Made to order, not returnable)

2 ea. 4" High Backsplash, in lieu of standard

2 ea. No legs, mounts between two pieces of underbar equipment

ITEM 94 - 42" PASS-THRU COCKTAIL STATION (1 REQ'D)

Glastender, Inc. Model PSA-42R

Assembly Style Pass-Thru Cocktail Station, 42"W x 32"D, rightward workflow, pass-thru ice bin, (2) wet waste sinks with (1) gooseneck faucet (low lead compliant) & strainers, liquor bottle storage, 15"D stainless steel draining shelf with removable perforated inserts, ETL-Sanitation (Made to order, not returnable)

- 1 ea. 1 year parts & labor warranty
- 1 ea. Special order note: Note: This is a manufactured to order item and is NOT returnable
- 1 ea. Stainless Steel Front & End Panels
- 1 ea. Aerator, faucet, 2.0 GPM
- 1 ea. Combined blender shelf with double speed rail
- 1 ea. Ten-circuit cold plate
- 1 ea. Tubing chase
- 2 ea. Model UMGH Undercounter Mount Soda Gun Holder, fits Wunder-Bar® or Schroeder America™ style soda guns, includes 10 feet of vinyl drain tube, rubber grommet, plastic drip pan, 14 ga. stainless steel construction
- 1 ea. Pass-thru soda manifold housing with (2) soda gun holders

ITEM 95 - 12" UNDERBAR DRAINBOARD (1 REQ'D)

Glastender, Inc. Model DBB-12

Underbar Drainboard, free standing, 12"W x 24"D, drain pan with removable perforated insert, stainless steel construction, stainless steel legs with adjustable stainless steel bullet feet, ETL-Sanitation

- 1 ea. 1 year parts & labor warranty
- 1 ea. 4" High Backsplash, in lieu of standard

ITEM 96 - BLENDER, BAR (1 REQ'D)

Hamilton Beach Commercial Model HBH755R

High Performance Blender, 64 oz. (2 liter) capacity, Wave-Action System, one-touch blending functions, 100 pre-programmed cycles, memory card slot, Quiet-Blend technology, removable polycarbonate Quiet Shield, converts for in-counter use, stainless steel blade, 3Hp, 120v/60/1-ph, 12 amps, cULus, NSF

ITEM 97 - TRASH RECEPTACLE, INDOOR (9 BY OWNER)

Not Included in Contract

Item number for scheduling purposes.

END OF SECTION 11 4000

SECTION 12 2400 WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Interior manual roller shades.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.
- B. Section 08 5000-Windows: Coordination with Window System installed.
- C. Section 09 2116-Gypsum Board Assemblies: Coordination with gypsum board assemblies for installation of brackets and related accessories.

1.03 REFERENCE STANDARDS

- A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.
- B. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.
- C. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.
- B. Sequencing:
 - 1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place. "Hold to" dimensions are not acceptable.
 - 2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- C. Shop Drawings: Use same room designations as indicated on the Drawings.
 - 1. Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
- D. Selection Samples: Include fabric samples and trim samples in full range of available colors and patterns.
- E. Verification Samples: Minimum size 8 x 10 inches, representing actual materials, color and pattern as indicated on Drawings.
- F. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- G. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.

- H. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
- I. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum of five years of documented experience with shading systems of similar size and type.
 - 1. Installer to provide references and examples upon request of Architect and/or Owner.

1.07 MOCK-UP

- A. Mock-Up: Provide full size mock-up of window shade system complete with selected shade fabric including example of seams and batten pockets when applicable.
 - 1. Obtain Architect's approval of light and privacy characteristics of fabric prior to fabrication.
 - 2. Full-sized mock-up may become part of the final installation.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening using designations indicated on Drawings.
- B. Handle and store shades in accordance with manufacturer's recommendations.

1.09 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Field Measurements: Where window shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Allow clearances for operating hardware of operable glazed units through entire operating range.
 - 2. Notify Architect of installation conditions that vary from Drawings.
 - 3. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
 - 1. Shade Hardware: Ten years.
 - 2. Fabric: Twenty-five years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Interior Manually Operated Roller Shades:
 - 1. Draper, Inc: www.draperinc.com/#sle.
 - 2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
 - 3. MechoShade Systems LLC (Basis of Design): www.mechoshade.com/#sle.
 - 4. SWFcontract, a division of Springs Window Fashions, LLC.: www.swfcontract.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.02 ROLLER SHADES

- A. General:
 - 1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
 - 2. Provide shade system that operates smoothly when shades are raised or lowered.
- B. Roller Shades (RWS):
 - 1. Description - Interior Roller Shades: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
 - a. Drop Position: Regular roll.
 - b. Roll Direction: Roll down, closed position is at window sill.
 - c. Mounting: Window jamb mounted - inside, between jambs.
 - d. Size: As indicated on Drawings.
 - e. Fabric: As indicated on Drawings.
 - 2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - 3. Roller Tubes: As required for type of shade operation.
 - a. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
 - 4. Hembars: Designed to maintain bottom of shade straight and flat.
 - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
 - 5. Manual Operation for Interior Shades:
 - a. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
 - b. Drive Chain: Continuous loop, beaded ball chain with restraining device, 95 lb minimum breaking strength; comply with WCMA A100.1. Provide upper and lower limit stops.
 - c. Chain Retainer:
 - 1) Chain tensioning device complying with ANSI/WCMA A100.1-2022 Child Safety Standard set by the Window Covering Manufacturers Association (WCMA)
 - 6. Accessories:
 - a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; clear anodized finish.
 - 1) Color: Select from Manufacturer's full range.
 - 2) Profile: Square.
 - b. End Caps: Provide manufacturer's standard end caps to cover exposed ends of brackets.

2.03 SHADE FABRIC

- A. Fabric: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 - 1. Manufacturers:
 - a. As indicated on Drawings.
 - 2. Performance Requirements:
 - a. Flammability: Pass NFPA 701 large and small tests.
 - 3. Openness Factor: As indicated on Drawings.
 - 4. Color: As indicated on Drawings.

2.04 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: As recommended in writing by manufacturer.
- C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.
- B. If substrate preparation is the responsibility of another installer, notify Architect or Contractor of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation through entire operational range.

3.04 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

3.05 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

3.06 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
 - 1. If touch-up, repair, or replacement of damaged products cannot be completed before Substantial Completion, coordinate with Contractor.

END OF SECTION 12 2400

**SECTION 12 3600
COUNTERTOPS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Countertops for architectural cabinet work.
- B. Wall-hung counters and vanity tops.

1.02 RELATED REQUIREMENTS

- A. Section 06 4100 - Architectural Wood Casework
- B. Section 07 9200 - Joint Sealers
- C. Division 22 - Plumbing: Sinks.

1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2022.
- B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.
- C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
- E. AWI (QCP) - Quality Certification Program; Current Edition.
- F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- G. AWMAC (GIS) - Guarantee and Inspection Services Program; Current Edition.
- H. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- I. IAPMO Z124 - Plastic Plumbing Fixtures; 2022, with Editorial Revision.
- J. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- K. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
- L. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- M. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.
- N. PS 1 - Structural Plywood; 2023.
- O. WI (CCP) - Certified Compliance Program (CCP); Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation.
- D. Verification Samples: For each finish product specified, provide one 6 inches square size minimum sample, representing actual product, color, and patterns.

- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- G. Installer's qualification statement.
- H. Installation Instructions: Manufacturer's installation instructions and recommendations.
- I. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
- B. Quality Certification:
 - 1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
 - 2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) requirements for grade or grades specified.
 - 3. Provide designated labels on shop drawings as required by certification program.
 - 4. Provide designated labels on installed products as required by certification program.
 - 5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.
- B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
- C. Keep surfaces of countertops covered with protective covering during handling and installation.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 PRODUCTS

2.01 COUNTERTOPS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- B. Solid Surfacing Countertops (SSF) : Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.

2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - b. NSF approved for food contact.
 - c. Sinks and Bowls: Separate units for undercounter mounting; minimum 3/4 inch wall thickness; comply with IAPMO Z124.
 - d. Finish on Exposed Surfaces: Smooth, 5mm radius edges.
 - e. Color and Pattern: As indicated on Drawings.
 3. Other Components Thickness: 1/2 inch, minimum.
 4. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; square edge; use marine edge at sinks.
 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
 6. Fabricate in accordance with AWI/AWMAC/WI (AWS), Section 11 - Countertops, Premium Grade.
- C. Natural Quartz (QTZ) ; (QTZ): Sheet or slab of natural quartz and plastic resin over continuous substrate.
1. Flat Sheet Thickness: 3 cm, minimum.
 2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. NSF approved for food contact.
 - d. Finish on Exposed Surfaces: Polished.
 - e. Color and Pattern: As indicated on Drawings.
 3. Other Components Thickness: 3/4 inch, minimum.
 4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
 5. Fabricate in accordance with AWI/AWMAC/WI (AWS), Section 11 - Countertops, Premium Grade.

2.02 MATERIALS

- A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- B. Joint Sealant: Mildew-resistant silicone sealant, clear.
 1. Joint width to have no more than 1/8 inch gap from adjacent wall and/or full height cabinet.

2.03 ACCESSORIES

- A. Fixed Top-Mounted Countertop Support Brackets:
 1. Material: Steel.
 2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 3. Size: Of sufficient length and height to support the countertop depth indicated on Drawings.

4. Products:
 - a. Rakks Brackets: www.rakks.com
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Concealed Support Bracket
 1. Material: Steel
 2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 3. Size: Of sufficient length and height to support the countertop depth indicated on Drawings.
 4. Products:
 - a. Rakks Brackets; Inside Wall-Flush Mount EH Bracket: www.rakks.com
 5. Accessories: Provide blocking as required for use with Quartz and Solid Surface countertops.

2.04 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 1. Join lengths of tops using best method recommended by manufacturer.
 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 2. Mechanically fasten back and side splash to countertops as recommended by laminate manufacturer at 16 inches (400 mm) on center.
 3. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops, wall panels, and back/side splash up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on Drawings, finished to match.
- E. Provide cutouts for plumbing fixtures, appliances, outlet boxes, and inserts. Verify locations of cutouts from on-site dimensions. Seal cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Apply sealer products in accordance with manufacturer's written instructions.
- C. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

3.05 ADJUSTING AND CLEANING

- A. Clean countertops exposed and semi-exposed surfaces thoroughly.
- B. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.
- C. Follow manufacturer's cleaning standards and guidelines.

3.06 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 12 3600

SECTION 21 0500
FIRE PROTECTION GENERAL PROVISIONS

PART 1 GENERAL

1.1 SUMMARY

A. Specification Format

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
 - a. "Part 1 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
 - b. "Part 2 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
 - c. "Part 3 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions

1. **Furnish:** Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. **Install:** Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. **Or Approved Equal:** Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. **Or Equivalent:** Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. **Provide:** Furnish and install in place, total and operational.

6. Complete/Completely: All pipes, fittings, ducts, wiring supplies, and accessories provided for the noted equipment from the equipment to the mains or noted termination points.

1.2 NOMENCLATURE

- A. NICET: National Institute for Certification in Engineering Technologies.
- B. Pipe sizes listed are nominal pipe sizes throughout this Division except where otherwise noted.

1.3 SCOPE OF WORK

- A. The work covered by this Division consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of the fire protection systems, in strict accordance with Division 21 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.
- B. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.
- C. Examine site and all Contract documents prior to submittal of bid.
 1. Submittal of a Bid shall indicate the Contractor has examined the Site and Drawings and has included all required allowances in this Bid. No allowance shall be made for errors resulting from the Contractor's failure to visit job sites and to review Drawings.
- D. Division 21 Work: Includes the following system types:
 1. Wet-Pipe Sprinkler System.
- E. Delegated-Design: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data by a NICET Level III certified designer or licensed Professional Engineer responsible for their preparation.
 1. Everything necessary for the complete and successful operation of this system, whether or not definitely specified on the Drawings shall be furnished and installed as if specified or indicated.
- F. The Fire Protection Contractor will be a sub-contractor to the Division 23 Contractor.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design system for Class A, B, and C fires as appropriate for areas being protected, and include safety factor.
- B. Fire-extinguishing system design shall be approved by authorities having jurisdiction and shall be in accordance to architectural drawings and code plans.

1.5 WORK BY OTHERS

- A. Painting.
- B. Wiring by Division 26.
- C. Water Service into Building.
- D. Exterior Fire Protection Mains.
- E. Fire Hydrants.

1.6 ALTERNATES

- A. Refer to Division 01 for Alternates.

1.7 CONTINGENCY

- A. Refer to Division 01 for amount to include in Mechanical Bid.

1.8 SUBMITTALS

- A. General:
 - 1. Preferred Submittal Format: PDF, unless otherwise noted.
 - 2. Preferred Submittal Nomenclature: Unless otherwise noted, PDF submittals are to be named according to the following:
 - a. [Specification Section Number] – [Specification Name or Equipment Included]
 - 3. Distribution: Unless otherwise noted, direct all correspondence concerning Division 21 submittals to:
 - a. Justin Byrne
 - b. PRAIRIE ENGINEERING, P.C.
 - c. 1905 17TH STREET SE
 - d. MINOT, ND 58701
 - e. jbyrne@prairieengineeringpc.com
- B. Substitution and Prior Approval to Quote.
 - 1. Format and Content: Complete descriptive technical data on the proposed item consisting of model numbers, type, size and performance characteristics.
 - 2. Submission Timing: Minimum of 192 hours (eight days) prior to bid opening.

- a. Substitutions will not be permitted after bid opening except where such substitution is considered by the Engineer to be in the best interest of the Owner.
 3. Bidder Notification: Prior to bid opening via Addenda, sent to all planholders.
 4. Contractor Responsibility: This contractor will be responsible for all coordination, construction costs, and Architectural/Engineering design fees required to substitute equipment that has different characteristics than designed including weights, physical dimensions, clearances, mechanical characteristics, electrical characteristics, and other characteristics deemed important to the design by the Architect/Engineer.
 5. Alternative Format: Printed paper, two copies; Self-addressed, stamped envelope required for return reply.
- C. Schedule of Values.
1. Format and Content: When included with the Bid, at minimum the following categories shall be indicated:
 - a. "Sprinkler Riser"
 - b. "Controls"
 - c. "Wet Pipe Suppression System"
 2. Submission Timing: Prior to first payment application.
- D. Shop Drawings: Submit to Engineer via the Prime Contractor for each item indicated.
1. Format and Content: Include catalog numbers, performance data, dimensions and other descriptive information.
 2. Contractor Review: Dated and signed cover sheet or review stamp for each Shop Drawing file to indicate thorough review. Email message text not acceptable.
 3. Non-Conforming: Returned to Contractor without review.
 4. Submission Timing: Prior to delivery of materials to job site.
- E. Shop Drawings, Wet-pipe Sprinkler Systems:
1. Include plans, elevations, sections, details, and attachments to other work.
 2. Wiring Diagrams: For power, signal, and control wiring.
 3. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

G. Record Drawings

1. Format and Content: Paper copy of Drawings project site.
 - a. As work progresses, Contractor's field supervisor shall mark Record Drawings in red pencil to indicate actual conditions of installation.
 - b. Give particular attention to marking actual locations of underground piping.
 - c. Affix all addendum and change order descriptions to appropriate record drawing sheet, utilizing spray adhesive.
 - d. Make Record Drawings available to Engineer during project visitation.
2. Submission Timing: Close of project with Record Manuals.

H. Spare Equipment and Devices

1. Distribution: Owner.
2. Format and Content: List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
3. Submission Timing: Close of project with Record Manuals.

I. Operation and Maintenance Manuals

1. Submission Timing: Close of project, as condition of its acceptance.
2. Record Manual information shall be included for all equipment/material where Shop Drawings are required.
3. Format and Content: Two copies, Loose-leaf hardcover binders, and in PDF format on CDs.
 - a. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual and CD or USB drive.
 - b. Include an index sheet indicating subcontractor and subcontractor's phone number and each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
 - c. Include a copy of the Shop Drawings.
 - d. Include all installation, operation and maintenance data packaged with any equipment.
 - e. Include all signed and dated final punch lists from walkthroughs performed by the Engineer.

1.9 APPLICATIONS FOR PAYMENT

- A. Refer to Division 1 "Applications for Payment".
- B. Provide one additional copy, sent directly to the Engineer.
- C. Schedule of Values: At minimum, include items in Submittal article.

1.10 CHANGES TO CONTRACT

- A. Any required changes to the contract after bid date shall be in accordance with General Conditions/Division 01 and this section. Where any discrepancies between the sections are encountered, the more restrictive section shall apply.
- B. Proposed changes shall be accompanied with complete substantiating documentation.
 - 1. Provide an itemized list of quantities for materials, equipment, and supplies.
 - a. Include unit costs for each item and extended price.
 - b. Include unit labor for each item and extended time.
 - 2. Provide subcontractor proposals that include the same substantiating documentation.
 - 3. Provide quotations from suppliers for any specially ordered equipment.
- C. Material costs shall be actual costs to the contractor, obtaining the materials through normal supply channels, including trade and quantity discounts. Utilizing "suggested pricing" from national pricing organizations for unit costs shall not be accepted. Upon request, the contractor or subcontractor shall submit evidence to substantiate the costs.
- D. Labor units shall be industry accepted standard labor hours to perform one unit of work. If the work is being performed in a location that is not considered to be standard working conditions for that specific task, additional labor shall be itemized.
- E. Labor rates shall be the actual rate paid for the workman category along with associated labor burden. Labor burden shall consist only of the mandatory fringe benefits, labor taxes, and labor insurances as affected by payroll. The owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the fringe benefit cost is in excess of established labor agreements.
- F. Subcontractors shall compute their costs in the same manner as the contractor. Subcontractors are subject to the same markup constraints as described herein.

1.11 AUTHORITIES AND AGENCIES

- A. All work will be installed for the approval and acceptance of the following:
 - 1. Insurance Services Office
 - 2. State Fire Marshall

3. Local Fire Inspection Office

- B. Any permits for the installation or construction of any of the work included in this section, which are required by any of the Authorities or Agencies having jurisdiction, shall be obtained and paid for by the Fire Protection Contractor.
- C. All inspections, examinations and tests of any of the work included in this section, which are required by any of the Authorities or Agencies having jurisdiction, shall be obtained and paid for by the Fire Protection Contractor.

1.12 QUALITY ASSURANCE

A. Qualifications of Installers

- 1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
- 2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.13 WARRANTY

- A. The entire Fire Protection installation, as specified under this Section of the Specifications, shall be guaranteed for one (1) year against defective equipment, materials and workmanship. The liability of the Fire Protection Contractor under this guarantee is limited to repair or replacement of fire protection defective equipment, materials or workmanship. The guarantee period is to begin on the date the equipment is placed in operation at the Owner's request for his convenience or from the date a successful acceptance test is made, whichever occurs first.
- B. The guarantee shall not be construed as requiring the Fire Protection Contractor to render service or maintenance required in the normal operation of the equipment or to make repairs that may be needed due to normal wear and tear or the Owner's negligence, abuse or breakage.

1.14 TEMPORARY FACILITIES

- A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

PART 2 PRODUCTS

2.1 MATERIAL

- A. All material, equipment, valves and devices, installed or furnished under this Section, shall be listed or approved for use in the Fire Protection installation by the Authorities, Agencies, Codes and Standards named in this Section of the Specification.
 - 1. Underwriter's Laboratories - Approved Fire Protection Equipment List

2. Factory Mutual Approved Equipment Manual

- B. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.
- C. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.
- D. Fire Stop System material shall be by 3M "Fire Barrier", Metacaulk, Hilti, Nelson Firestop Products, or AD Fire.
- E. See Division 07 for further details on approved materials.

2.2 ELECTRIC WIRING

- A. The Division 21 Contractor shall furnish and install all water flow switches, air pressure switches and alarms, valve supervisory switches, visual/audible alarms, fire pump and controller, control panels, pre-action detection devices, air compressor and controls, special controls and electrical devices as specified herein for proper operation of the equipment furnished.
- B. The Division 23 Contractor shall furnish and install all ventilation equipment and dampers, unless otherwise noted in the Drawings or Specifications.
- C. Division 26 Contractor shall furnish and install, as required, wiring to supervisory switches, flow switches and alarms; and power wiring to fire pump and controller; furnished separately by Division 21 Contractor, unless otherwise noted in Equipment Specifications.
 - 1. Clean Agent Fire Extinguishing System and Preaction Sprinkler System: Division 26 Contractor shall furnish and install, as required, 120 volt wiring to control panels, and interface wiring for equipment shut down.

PART 3 EXECUTION

3.1 GENERAL

- A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.
- B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.
- C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.
- D. In general, it is intended that piping be installed parallel to building lines, unless otherwise shown on the Drawings, and that equipment be located symmetrical with the architectural elements of the building.
- E. Install piping above grid ceilings to allow easy removal of ceiling tiles. Install exposed piping as high as possible except where noted otherwise.

3.2 SURFACE CONDITIONS

- A. Prior to work, 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.
- B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.
- B. Plugs: Install in ends of uncompleted piping at end of each day or when work stops.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

3.4 COORDINATION

- A. Order equipment and material in a timely fashion to assure it is on the job site when required.
- B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.
- C. Coordinate pipe routing with other trades to avoid conflicts with ductwork and other piping system.
- D. Division 21 piping and equipment installations shall comply with National Electrical Code requirements 110.26 "working spaces" and "dedicated spaces". Pipes shall not be installed in the space near electrical panels/equipment defined as "working spaces" or "dedicated spaces".

3.5 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

- A. Discrepancies
 - 1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
 - 2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
 - 3. Written interpretation or clarification will be made by Addenda.
- B. Construction Conflicts
 - 1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.

2. Do not proceed with installation in area of question until conflict has been fully resolved.
3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.

C. Drawings

1. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.6 CUTTING AND PATCHING

- A. Refer to General Conditions. Unless specifically called out to be performed by other Contractors, the Division 21 Contractor shall perform all cutting and patching required for the installation of material and equipment furnished under his Contract.
- B. Opening/holes cut to allow passage of pipes through concrete floor shall be patched by the Contractor doing the cutting unless indicated otherwise on the Drawings.
- C. Fire-Barrier Penetrations
 1. Pipe penetrations through fire rated walls and floors shall be sealed with a UL classified Fire Stop System. Fire Stops shall be provided in accordance with the appropriate System No. as it relates to pipe size/Material and wall or floor rating/material.
 2. See Specification Section 210510 for other Fire-Barrier Penetration requirements.
 3. See Section 2 article "Materials" of this Specification for approved fire stop system material.
- D. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.
- E. Use only rotary type drilling tools to cut concrete.
- F. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.7 FIELD QUALITY CONTROL

- A. Perform field tests and inspections. Test new piping and parts of existing piping that have been altered, extended, or repaired.
- B. Ceiling Inspection: An above ceiling inspection by the Architect/Engineer shall take place prior to the installation of the ceiling, to ensure that everything is properly sealed, accessible, and fire sealed if required.
- C. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained. Piping will be considered defective if it does not pass tests and inspections.

3.8 INSTRUCTIONS

- A. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Written instructions shall be graphical insofar as practical.
- B. Division 21 Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment.

END OF SECTION

**SECTION 21 0510
COMMON WORK RESULTS FOR FIRE SUPPRESSION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Above ground piping.
- B. Escutcheons.
- C. Mechanical couplings.
- D. Mechanical pressed fittings.
- E. Pipe hangers and supports.
- F. Pipe sleeves.

1.2 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 21 0523 - General-Duty Valves for Water-Based Fire-Suppression Piping.
- C. Section 21 0553 - Identification for Fire Suppression Piping and Equipment: Piping identification.
- D. Section 21 0716 - Fire Suppression Equipment Insulation: Insulation of fire suppression equipment piping, fittings, valves, mechanical couplings, connections, hangers, insulation inserts, shields, etc.
- E. Section 21 1300 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.

1.3 SUBMITTALS

- A. See Section 210500 Fire Protection General Provisions for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information. Indicate valve data and ratings.
- C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- D. Installer's qualification statement.
- E. Project Record Documents: Record actual locations of components and tag numbering.
- F. Operation and Maintenance Data: Include installation instructions and spare parts lists.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Sprinkler-based System:
 - 1. Comply with NFPA 13.
 - 2. See Section 21 1300.
- B. Welding Materials and Procedures: Comply with ASME BPVC-IX.
- C. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

2.2 ABOVE GROUND PIPING

- A. Steel Pipe: ASTM A795 Schedule 40, black.
 - 1. Steel Fittings: ASME B16.5 steel flanges and fittings.
 - 2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
 - 3. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.
 - 4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.
 - 5. Mechanical Formed Fittings: Carbon steel housing with integral pipe stop and O-ring pocked and O-ring, uniformly compressed into permanent mechanical engagement onto pipe.
- B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), H58 drawn.
 - 1. Fittings: ASME B16.18, cast copper alloy, grooved.
 - 2. Mechanical Grooved Couplings: Ductile iron housing with alkyd enamel paint coating clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers.
- C. CPVC Pipe: ASTM F442/F442M, SDR 13.5.
 - 1. Fittings: ASTM F438 Schedule 40, or ASTM F439 Schedule 80, CPVC.
 - 2. Joints: Solvent welded, using ASTM F493 cement.
 - 3. Manufacturers:
 - a. IPEX BlazeMaster: www.ipexna.com/#sle.
 - b. Viking BlazeMaster: www.vikinggroupinc.com/#sle.

c. Substitutions: See Section 210500.

D. Ductile Iron Pipe: AWWA C151/A21.51.

1. Fittings: AWWA C110/A21.10, standard thickness.
2. Joints: AWWA C111/A21.11, SBR or vulcanized styrene-butadiene rubber gasket.
3. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped composition sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.3 PIPE SLEEVES

A. Vertical Piping:

1. Sleeve Length: 1 inch above finished floor.
2. Provide sealant for watertight joint.

B. Plastic, Sheet Metal, or Moisture-Resistant Fiber: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.

C. Pipe Passing Through Below Grade Exterior Walls:

1. Zinc-coated or cast-iron pipe.
2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

D. Clearances:

1. Wall, Floor, Floor, Partitions, and Beam Flanges: 1 inch greater than external; pipe diameter.
2. Rated Openings: Caulked tight with firestopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.

2.4 ESCUTCHEONS

A. Material:

1. Chrome-plated.
2. Metals and Finish: Comply with ASME A112.18.1.

B. Construction:

1. One-piece for mounting on chrome-plated tubing or pipe and one-piece or split-pattern type elsewhere.

2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

2.5 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.
- G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- H. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.6 MECHANICAL COUPLINGS

- A. Rigid Mechanical Couplings for Grooved Joints:
 1. Dimensions and Testing: Comply with AWWA C606.
 2. Minimum Working Pressure: 300 psig.
 3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
 4. Housing Coating: Factory applied orange enamel.
 5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
 6. Bolts and Nuts: Hot-dipped-galvanized or zinc-electroplated steel.

2.7 MECHANICAL PRESSED FITTINGS

- A. Provide double-pressed type, utilizing EPDM, nontoxic, synthetic rubber sealing elements for use with Schedule 40 carbon steel piping.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:
 - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 2. Place hangers within 12 inches of each horizontal elbow.
 - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 - 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 6. Provide copper plated hangers and supports for copper piping.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
- I. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
 - 1. All Rated Openings: Caulk tight with firestopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.
- J. Escutcheons:
 - 1. Install and firmly attach escutcheons at piping penetrations into finished spaces.

2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
 3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
- K. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

3.3 CLEANING

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION

SECTION 21 1300
FIRE-SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wet-pipe sprinkler system.
- B. System design, installation, and certification.
- C. Fire department connections.

1.2 REFERENCE STANDARDS

- A. NFPA 1963 - Standard for Fire Hose Connections; 2019.
- B. UL 405 - Standard for Safety Fire Department Connection Devices; Current Edition, Including All Revisions.

1.3 SUBMITTALS

- A. See Section 210500 Fire Protection General Provisions for submittal procedures.
- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Shop Drawings:
 - 1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
 - 2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components, and accessories. Indicate system controls.
- D. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
 - 2. Sprinkler Wrenches: For each sprinkler type.

1.4 QUALITY ASSURANCE

- A. Comply with FM (AG) requirements.

- B. Designer Qualifications: Certified NICET Level III, or design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum of 2 years experience in the successful installation and operation of Fire Protection systems.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sprinklers, Valves, and Equipment: Subject to compliance with requirements, provide products by one of the following or other prior approved:
 - 1. Anvil International: www.anvilintl.com/#sle.
 - 2. Tyco Fire Protection Products: www.tyco-fire.com/#sle.
 - 3. Viking Corporation: www.vikinggroupinc.com/#sle.
 - 4. Substitutions: See Section 210500.

2.2 SPRINKLER SYSTEM

- A. Sprinkler System: Provide coverage for entire building.
- B. Occupancy: Determined by Designer.
- C. Water Supply: Determine volume and pressure from water flow test data.
 - 1. If test data is not available, coordinate with local utility and obtain prior to bidding.
- D. Provide fire department connections where indicated.
- E. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.3 SPRINKLERS

- A. Finished Ceiling Type:
 - 1. Flush concealed sprinklers: Rough brass with white cover plate.
- B. Exposed Type:
 - 1. Finished Spaces: Chrome plated pendent or sidewall.

2. Unfinished Spaces: Rough bronze pendent or sidewall.
- C. Flexible Drop System: Stainless steel, multiple use, open gate type.
 1. Application: Use to properly locate sprinkler heads.
 2. Include all supports and bracing.
 3. Provide braided type tube as required for the application.
 4. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
 - a. FlexHead Industries, a brand of Anvil International
 - b. Easyflex.
 - c. Victaulic Company; Vic-Flex
 - d. Rascoflex.
 - e. Substitutions: See Section 210500.

2.4 PIPING SPECIALTIES

- A. Backflow Preventer: Double check valve assembly backflow preventer with drain and UL/FM approved valves on each end.
 1. Valves: OS&Y gate valve or Butterfly valves.
- B. Test Connections:
 1. Backflow Preventer Test Connection:
 - a. Provide downstream of the backflow prevention assembly, listed hose valves with 2.5 inch National Standard male hose threads with cap and chain.
 - b. Furnish one valve for each 250 gpm of system demand or fraction thereof.
 - c. Provide permanent sign reading "Test Valve" in accordance with Section 21 0553.
- C. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.
- D. Fire Department Connections:
 1. Type: Flush, wall mount made of corrosion resistant metal complying with UL 405.
 - a. Inlets: Two way, 2-1/2 inch swivel fittings, internal threaded. Thread size and inlets according to NFPA 1963 or Authority Having Jurisdiction. Brass caps with gaskets, chains, and lugs.

- b. Configuration: Horizontal.
- c. Finish: Chrome.
- d. Signage: Raised or engraved lettering 1 inch minimum indicating system type.
- e. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
 - 1) Elkhart Brass Manufacturing Company, Inc: www.elkhartbrass.com/#sle.
 - 2) Potter Roemer.
 - 3) Substitutions: See Section 210500.
- E. Valve Supervisory Switches:
 - 1. Type: Electrically supervised.
 - 2. Function: Signals that controlled valve is in other than fully open position.

2.5 AUDIBLE VISUAL ALARMS

- A. Description: Weatherproof, strobe/horn unit, wall mounted, UL listed.
- B. Strobe: Xenon flash, high impact lens.
 - 1. Effective Candle Power: Minimum 15.0.
 - 2. Peak Candle Power: 135,000.
- C. Horn: 95dBA.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Connect fire-protection standpipe piping to flange provided by mechanical contractor on water-service piping at service entrance into building.
- C. Install equipment in accordance with manufacturer's instructions.
- D. Provide approved double check valve assembly at sprinkler system water source connection.
- E. Locate outside alarm on building wall as indicated.
- F. Place pipe runs to minimize obstruction to other work.
- G. Place piping in concealed spaces above finished ceilings.
- H. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.

- I. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- J. Flush entire piping system of foreign matter.
- K. Hydrostatically test entire system.
- L. Require test be witnessed by Authority Having Jurisdiction.
- M. Piping Standard: Comply with requirements in NFPA 14 for installation of fire-protection standpipe piping.
- N. Install drain valves on standpipes. Extend drain piping to outside of building.
- O. Install automatic (ball drip) drain valves to drain piping between fire-department connections and check valves. Drain to floor drain or outside building.
- P. Install alarm devices in piping systems.
- Q. Install sleeves for piping penetrations of walls, ceilings, and floors.
- R. Install sleeve seals for piping penetrations of exterior concrete walls and slabs.
- S. Install escutcheons for piping penetrations of walls, ceilings, and floors.
- T. Bushings of any type to obtain reduction in size in fittings are not acceptable.

3.2 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
- D. Specialty Valves:
 - 1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
 - 2. Alarm Valves: Include bypass check valve and retarding chamber drain-line connection.
- E. Install audible visual alarm above fire department connection.

3.3 FLEXIBLE SPRINKLER HOSE INSTALLATION

- A. Install flexible sprinkler hose connections to heads in all areas with a finished suspended or sheetrock ceiling.
 - 1. Exceptions: Where limited space is a factor and minimum bend radius is not possible. Verify these locations with design engineer and indicate them on the Fire Sprinkler Shop Drawings.
- B. Mount heads to bracket system manufactured by same manufacturer as flexible connector drops.
- C. Do not over-bend flexible hose. Do not exceed manufacturer recommended minimum radius.

3.4 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 14.
- B. Identify system components, wiring, cabling, and terminals.

3.5 FIELD QUALITY CONTROL

- A. Fire Sprinkler Service Piping Tests: Test service piping as required by the Authority Having Jurisdiction or, in absence of published procedures, as follows:
 - 1. Witness: Test shall be performed in the presence of the Authority Having Jurisdiction or the representative of the Owner.
 - 2. Testing: Before the joints are covered in order for leaks to be detected.
 - 3. Pressure: Minimum of 200 psig, if maximum static pressure is 150 psig or greater the pressure test shall be 50 psig greater than maximum pressure test.
 - 4. Duration: Two (2) hours.
 - 5. Leakage Rate: Not to exceed two quarts/hr per 100 joints or gaskets irrespective of pipe diameter. Leakage for metal seated valves may increase above leakage rate by one fluid ounce per inch valve diameter per hour for each metal seated valve isolating the test section.
 - 6. Control Valves: Operating test shall be performed on all control valves when system is under full pressure to ensure proper operation.
 - 7. Certification: Upon completion, this Contractor shall complete the "Contractor's Material & Test Certificate For Underground Piping" contained in NFPA 2 and submit copies to the Owner, Engineer, Local Fire Chief and ISO Commercial Risk Services, Inc.
 - 8. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

9. Flush, test, and inspect sprinkler systems according to NFPA 13, "System Acceptance" Chapter.
 10. Flush, test, and inspect standpipe systems according to NFPA 14, "System Acceptance" Chapter.
 11. Energize circuits to electrical equipment and devices.
 12. Coordinate with fire-alarm tests. Operate as required.
- B. Verify that equipment hose threads are same as local fire-department equipment.

END OF SECTION

**SECTION 22 0500
PLUMBING GENERAL PROVISIONS**

PART 1 GENERAL

1.1 SUMMARY

A. Specification Format

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
 - a. "Part 1 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
 - b. "Part 2 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
 - c. "Part 3 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions:

1. **Furnish:** Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. **Install:** Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. **Or Approved Equal:** Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. **Or Equivalent:** Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. **Provide:** Furnish and install in place, total and operational.
6. **Complete/Completely:** All pipes, fittings, wiring supplies, and accessories provided for the noted equipment from the equipment to the mains or noted termination points.

1.2 SCOPE OF WORK

- A. The work covered by this Division consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of the plumbing systems, in strict accordance with Division 22 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.
- B. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.
- C. Examine site and all Contract documents prior to submittal of bid.
 - 1. Submittal of a Bid shall indicate the Contractor has examined the Site and Drawings and has included all required allowances in this Bid. No allowance shall be made for errors resulting from the Contractor's failure to visit job sites and to review Drawings.
- D. Division 22 Work: Includes, but is not limited to, providing the following:
 - 1. Potable Water Distribution System: Fixtures, piping, equipment.
 - 2. Waste and Vent Systems: Piping and specialties.
 - 3. Compressed Air Systems: Low pressure (below 150 psi) air piping.

1.3 ALTERNATES

- A. Refer to Division 01 for alternates.
- B. General
 - 1. The work of this Section is affected by the Alternates described in Division 1.

1.4 CONTINGENCY

- A. Refer to Division 01 for amount to include in Mechanical Bid.

1.5 SUBMITTALS

- A. General:
 - 1. Preferred Submittal Format: PDF, unless otherwise noted.
 - 2. Preferred Submittal Nomenclature: Unless otherwise noted, PDF submittals are to be named according to the following:
 - a. [Specification Section Number] – [Specification Name or Equipment Included]
 - 3. Distribution: Unless otherwise noted, direct all correspondence concerning Division 22 submittals to:
 - a. Justin Byrne

- b. PRAIRIE ENGINEERING, P.C.
- c. 1905 17TH STREET SE
- d. MINOT, ND 58701
- e. jbyrne@prairieengineeringpc.com

B. Substitution and Prior Approval to Quote:

1. Format and Content: Complete descriptive technical data on the proposed item consisting of model numbers, type, size and performance characteristics.
2. Submission Timing: Minimum of 192 hours (eight days) prior to bid opening.
 - a. Substitutions will not be permitted after bid opening except where such substitution is considered by the Engineer to be in the best interest of the Owner.
3. Bidder Notification: Prior to bid opening via Addenda, sent to all planholders.
4. Contractor Responsibility: This contractor will be responsible for all coordination, construction costs, and Architectural/Engineering design fees required to substitute equipment that has different characteristics than designed including weights, physical dimensions, clearances, mechanical characteristics, electrical characteristics, and other characteristics deemed important to the design by the Architect/Engineer.
5. Alternative Format: Printed paper, two copies; Self-addressed, stamped envelope required for return reply.

C. Schedule of Values

1. Format and Content: When included with the Bid, at minimum the following categories shall be indicated:
 - a. "Project mobilization"
 - b. "Demolition"
 - c. "Excavation and Backfill"
 - d. "Insulation"
 - e. "Domestic Water Piping System" (all piping, valves, shock arrestors, fittings, hangers, installed in place)
 - f. "Waste and Vent System" (all piping, valves, fittings, hangers, floor drains, interceptors, installed in place)
 - g. "Plumbing Fixtures" (all fixtures, faucets/flush valves, drain assemblies, water coolers, installed in place)

- h. "Plumbing Equipment" (all water heaters, recirculation pumps, expansion tanks, storage tanks, installed in place)
- i. "Compressed Air System" (all piping, valves, fittings, specialties, installed in place)

2. Submission Timing: Prior to first payment application.

D. Shop Drawings

- 1. Distribution: Engineer via the Prime Contractor for each item indicated.
- 2. Format and Content: Include catalog numbers, performance data, dimensions and other descriptive information.
 - a. Contractor Review: Dated and signed cover sheet or review stamp for each Shop Drawing file to indicate thorough review. Email message text not acceptable.
 - b. Non-Conforming: Returned to Contractor without review.
- 3. Submission Timing: Prior to delivery of materials to job site.

E. Record Drawings

- 1. Format and Content: Paper copy of Drawings project site.
 - a. As work progresses, Contractor's field supervisor shall mark Record Drawings in red pencil to indicate actual conditions of installation.
 - b. Give particular attention to marking actual locations of underground piping.
 - c. Affix all addendum and change order descriptions to appropriate record drawing sheet, utilizing spray adhesive.
 - d. Make Record Drawings available to Engineer during project visitation.
- 2. Submission Timing: Close of project with Record Manuals.

F. Spare Equipment and Devices

- 1. Distribution: Owner.
- 2. Format and Content: List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
- 3. Submission Timing: Close of project with Record Manuals.

G. Operation and Maintenance Manuals

- 1. Submission Timing: Close of project, as condition of its acceptance.

2. Record Manual information shall be included for all equipment/material where Shop Drawings are required.
3. Format and Content: Two copies, Loose-leaf hardcover binders, and in PDF format on CDs or USB drive.
 - a. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual and CD.
 - b. Include an index sheet indicating subcontractor and subcontractor's phone number; and each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
 - c. Include a copy of the Shop Drawings.
 - d. Include all installation, operation and maintenance data packaged with any equipment.
 - e. Include all signed and dated final punch lists from walkthroughs performed by the Engineer.

1.6 APPLICATIONS FOR PAYMENT

- A. Refer to Division 1 "Applications for Payment".
- B. Provide one additional copy, sent directly to the Engineer.
- C. Schedule of Values: At minimum, include items in Submittal article.

1.7 CHANGES TO CONTRACT

- A. Any required changes to the contract after bid date shall be in accordance with General Conditions/Division 1 and this section. Where any discrepancies between the sections are encountered, the more restrictive section shall apply.
- B. Proposed changes shall be accompanied with complete substantiating documentation.
 1. Provide an itemized list of quantities for materials, equipment, and supplies.
 - a. Include unit costs for each item and extended price.
 - b. Include unit labor for each item and extended time.
 2. Provide subcontractor proposals that include the same substantiating documentation.
 3. Provide quotations from suppliers for any specially ordered equipment.
- C. Material costs shall be actual costs to the contractor, obtaining the materials through normal supply channels, including trade and quantity discounts. Utilizing "suggested pricing" from national pricing organizations for unit costs shall not be accepted. Upon request, the contractor or subcontractor shall submit evidence to substantiate the costs.

- D. Labor units shall be industry accepted standard labor hours to perform one unit of work. If the work is being performed in a location that is not considered to be standard working conditions for that specific task, additional labor shall be itemized.
- E. Labor rates shall be the actual rate paid for the workman category along with associated labor burden. Labor burden shall consist only of the mandatory fringe benefits, labor taxes, and labor insurances as affected by payroll. The owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the fringe benefit cost is in excess of established labor agreements.
- F. Subcontractors shall compute their costs in the same manner as the contractor. Subcontractors are subject to the same markup constraints as described herein.
- G. For changes resulting in credit to the costs, no restocking fees for materials shall be applied by the contractor or subcontractors.

1.8 QUALITY ASSURANCE

A. Qualifications of Installers

- 1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
- 2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.

1.9 AUTHORITIES AND AGENCIES

- A. Materials, workmanship and installation: Comply with the latest editions of all applicable codes, local ordinances, industry standards, utility company regulations, insurance carrier requirements and these Specifications.
- B. Obtain and pay all permits, inspections, licenses and other charges pertaining to the Work. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.
- C. Codes and standards shall include, but not necessarily be limited to, the following:
 - 1. International Energy Conservation Code (IECC);
 - 2. Uniform Plumbing Code;
 - 3. North Dakota State Building Code;
 - 4. International Building Code (IBC);
 - 5. International Mechanical Code (IMC);
 - 6. International Fuel Gas Code (IFC);
 - 7. National Fire Protection Association (NFPA) – Sections as adopted by authority having jurisdiction.

- D. The more stringent provisions shall govern where provisions of pertinent codes and standards conflict with these Specifications or Drawings. Where Codes, Specifications or Drawings differ with one another, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies to the Engineer immediately.
 - 1. Pertinent codes and standards shall not be cited to furnish less than specifically shown or specified.
 - 2. Meeting the minimum standards of the above Codes does not permit a lower grade of construction where Plans or Specifications call for workmanship or materials in excess of Code Requirements.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.10 GUARANTEE AND WARRANTY

- A. Except where otherwise noted, contractor shall guarantee materials, workmanship and the proper operation of equipment for a period of one year after Owner's beneficial use of the building or mechanical system. Contractor shall correct all equipment, material and workmanship found to be defective or non-conforming to the contract documents without cost to Owner during that one year period.
- B. Guarantee shall include trips to the project site by Contractor to adjust mechanical equipment as required, ensuring it is operating as intended.
- C. Specified guarantee shall not relieve Contractor from liability arising from improper installation or non-compliance with applicable codes.

1.11 TEMPORARY FACILITIES

- A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

1.12 NOMENCLATURE

- A. Pipe sizes listed are nominal pipe sizes throughout this Division except where otherwise noted.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."
- C. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.

- D. Fire Stop System material shall be by 3M "Fire Barrier", Metacaulk, Hilti, Nelson Firestop Products, or AD Fire.
- E. See Division 07 for further details on approved materials.

2.2 ELECTRIC WIRING

- A. The Division 22 Contractor shall furnish all motors, special controls and electrical devices as specified herein for proper operation of the equipment furnished.
- B. Division 26 Contractor shall furnish and install, as required, disconnects, starters, switches, etc., and do all necessary power and control wiring including the installation of electrical devices such as thermostats, humidistats, remote control panels, etc., furnished separately by Division 22 Contractor, unless otherwise noted in Equipment Specifications.

PART 3 EXECUTION

3.1 GENERAL

- A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.
- B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.
- C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.

3.2 SURFACE CONDITIONS

- A. Prior to work of each Section of Division 22, 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.
- B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.
- B. Plugs: Install in ends of uncompleted piping at end of each day or when work stops.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

3.4 COORDINATION

- A. Order material in a timely fashion to assure it is on the job site when required.

- B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.
- C. Division 22 piping equipment installations shall comply with National Electrical Code requirements 110.26 "working spaces" and "dedicated spaces". Plumbing pipes shall not be installed in the space near electrical panels/equipment defined as "working spaces" or "dedicated spaces".

3.5 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

A. Discrepancies

- 1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
- 2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
- 3. Written interpretation or clarification will be made by Addenda.

B. Construction Conflicts

- 1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.
- 2. Do not proceed with installation in area of question until conflict has been fully resolved.
- 3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.

C. Drawings

- 1. Drawings indicate extent and general layout of plumbing systems for project. Due to small scale, it is not possible to indicate all fittings and accessories that may be required. Provide such fittings and accessories as required to form a complete and operating system in general conformance with Specifications and Drawings.
- 2. Exact locations, distances, levels and other conditions will be governed by the structure. Field measurements shall take precedence over the Drawings. Use the Drawings and these Specifications for guidance. Secure the Architect's approval for all changes in locations.
- 3. Verify all measurements at site. No compensation will be made because of difference between locations shown on the Drawings and measurements at the building.
- 4. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.6 UNDERGROUND UTILITIES

- A. Locations of existing underground utilities are based on available site information and are shown approximately. Contractor shall determine exact utility locations before commencing work and shall be responsible for repair of damages resulting from his construction activities to pre-construction condition.
- B. Trench and backfill for installation of underground piping to depth shown or required. Remove any accumulated water in excavation by pumping. Shore and brace excavation as required by safety regulations. Provide temporary bridges to maintain normal traffic flow. Excavation and backfill required by mechanical installations shall be accomplished in accordance with Division 31 Specifications by this Contractor.

3.7 REMOVAL AND/OR REUSE OF EXISTING MATERIALS AND EQUIPMENT

- A. Existing equipment, which is indicated as being removed and not indicated for reuse, shall remain the property of the Owner, stored as directed. Any material the Owner does not wish to retain shall be removed and disposed by the Contractor.
- B. Contractor shall assume in his Bid that existing equipment and materials shown to be reused are in good working condition and can be installed without any repairs. If certain items are found to be in need of repair or in unusable condition, Contractor shall notify the Engineer for decision, however, Contractor shall be responsible for any damage by his personnel to equipment in removal or handling.
- C. Material and other equipment removed and to be reused shall be cleaned before reinstallation.

3.8 OFFSETS

- A. Where required to allow clearance of ducts, electrical conduit and outlet boxes, beams, etc., to avoid interference with work of other trades, to increase head room under pipes or to improve the appearance of pipe work, this Contractor shall offset his pipes as directed by the Architect/Engineer.

3.9 CUTTING AND PATCHING

- A. Refer to General Conditions. Unless specifically called out to be performed by other Contractors, the Plumbing Contractor shall perform all cutting and patching required for the installation of material and equipment furnished under his Contract.
- B. Fire-Barrier Penetrations
 - 1. Pipe penetrations through fire rated walls and floors shall be sealed with a UL classified Fire Stop System. Fire Stops shall be provided in accordance with the appropriate System No. as it relates to pipe size/Material and wall or floor rating/material.
 - 2. See Specification Section 220510 for other Fire-Barrier Penetration requirements.
 - 3. See Section 2 article "Materials" of this Specification for approved fire stop system material.

- C. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.
- D. Use only rotary type drilling tools to cut concrete.
- E. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.10 CONNECTIONS TO KITCHEN EQUIPMENT

- A. The Division 22 Contractor shall provide rough-ins and connect the Kitchen equipment which is shown on the Drawings. Refer to Kitchen Equipment Schedule on Architectural or Food Service Drawings and Mechanical Drawings for more information.

3.11 FIELD QUALITY CONTROL

- A. Perform field tests and inspections. Test new piping and parts of existing piping that have been altered, extended, or repaired.
- B. Piping Inspections:
 - 1. Perform tests specified below in presence of authorities having jurisdiction:
 - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
 - b. Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
- C. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained. Piping will be considered defective if it does not pass tests and inspections.

3.12 ADJUSTING

- A. Perform the following domestic water adjustments before operation:
 - 1. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - 2. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.13 INSTRUCTIONS

- A. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Instructions to include all building's plumbing systems and equipment.
- B. Division 22 Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment. Provide similar equipment supplier's instructions where specified thus.

- C. Formal instructions shall be video recorded when required by other Sections of this Specification by this Contractor. Format shall be DVD. Formal instruction to be included with each Record Manual, being referenced to and a part of the Manual.

3.14 CLEAN UP

- A. Each Contractor shall be responsible for cleaning up after his work, including the removal of all scrap material left on the job by his men or Subcontractors. This will include the removal of all pipe cuttings, pieces of pipe and insulation and other debris.
- B. After all tests have been made and the plumbing systems are operating properly, this Contractor shall go over the entire system and remove labels from all plumbing fixtures and other plumbing equipment.
- C. All equipment having finished paint surfaces shall be examined upon completion for scratches and other damage. Touch up all surfaces as required with paint of color to match factory finish.

END OF SECTION

**SECTION 22 0517
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe sleeves.

1.2 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.

PART 2 PRODUCTS

2.1 PIPE SLEEVES

- A. Vertical Piping:

- 1. Sleeve Length: 1 inch above finished floor.
- 2. Provide sealant for watertight joint.

- B. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.

- C. Pipe Passing Through Mechanical, Laundry, and Animal Room Floors above Basement:

- 1. Galvanized steel pipe or black iron pipe with asphalt coating.
- 2. Connect sleeve with floor plate except in mechanical rooms.

- D. Clearances:

- 1. Provide allowance for insulated piping.
- 2. Wall, Floor, Partitions, and Beam Flanges: 1 inch greater than external pipe diameter.
- 3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

3.2 INSTALLATION

- A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- B. Install piping to conserve building space, to not interfere with use of space and other work.
- C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- D. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- E. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

END OF SECTION

SECTION 22 0553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Pipe markers.

1.2 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.1 PLUMBING COMPONENT IDENTIFICATION GUIDELINE

- A. Nameplates:
 - 1. Water heaters and other heat transfer products.
 - 2. Control panels, transducers, and other related control equipment products.
 - 3. Pumps, tanks, filters, water treatment devices, and other plumbing equipment products.
- B. Tags:
- C. Pipe Markers: 3/4 inch diameter and higher.

2.2 NAMEPLATES

- A. Description: Laminated piece with up to three lines of text.
 - 1. Letter Color: White.
 - 2. Letter Height: 1/4 inch.

2.3 TAGS

- A. Flexible: Vinyl with engraved black letters on light contrasting background color with up to three lines of text. Minimum tag size 1-1/2 inch in diameter.

- B. Metal: Brass, 19 gauge 1-1/2 inch in diameter with smooth edges, blank, smooth edges, and corrosion-resistant ball chain. Up to three lines of text.

2.4 PIPE MARKERS

- A. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.
- B. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install plastic pipe markers in accordance with manufacturer's instructions.
- C. Apply ASME A13.1 Pipe Marking Rules:
 - 1. Place pipe marker adjacent to changes in direction.
 - 2. Place pipe marker adjacent each valve port and flange end.
 - 3. Place pipe marker at both sides of floor and wall penetrations.
 - 4. Place pipe marker every 25 to 50 feet interval of straight run.

END OF SECTION

**SECTION 22 0719
PLUMBING PIPING INSULATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Combustible pipe insulation.
- B. Expanded polystyrene insulation.
- C. Flexible elastomeric cellular insulation.
- D. Glass fiber insulation.
- E. Polyethylene insulation.
- F. Jacketing and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.

1.3 REFERENCE STANDARDS

- A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
- B. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2023.
- C. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2022a.
- D. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- E. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2023).
- F. ASTM C1423 - Standard Guide for Selecting Jacketing Materials for Thermal Insulation; 2021.
- G. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- I. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

- J. SAE AMS3779 - Tape, Adhesive, Pressure-Sensitive Thermal Radiation Resistant, Aluminum Coated Glass Cloth; 2016b.
- K. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.2 GLASS FIBER INSULATION

- A. Manufacturers:
 - 1. CertainTeed Corporation: www.certainteed.com/#sle.
 - 2. Johns Manville Corporation: www.jm.com/#sle.
 - 3. Knauf Insulation: www.knaufinsulation.com/#sle.
 - 4. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.3 COMBUSTIBLE PIPE INSULATION

- A. Manufacturers:
 - 1. Johns Manville Corporation: Micro-Lok HP or Mico-Lok HP Ultra.

2. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Insulation: ASTM C547; rigid, molded, noncombustible.

1. Rated to a maximum 25/50 FS/SD per ASTM E84, CAN ULC S102.

2.4 EXPANDED POLYSTYRENE INSULATION

A. Insulation: ASTM C578; rigid closed cell.

1. K Value: 0.23 at 75 degrees F.
2. Maximum Service Temperature: 165 degrees F.
3. Maximum Water Vapor Permeance: 5.0 perm inch.

2.5 POLYETHYLENE INSULATION

A. Manufacturers:

1. Armacell LLC: www.armacell.us/#sle.
2. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Insulation: Flexible closed-cell polyethylene tubing, slit lengthwise for installation, complying with applicable requirements of ASTM D1056.

1. K Value: ASTM C177; 0.25 at 75 degrees F.
2. Maximum Service Temperature: 200 degrees F.
3. Density: 2 pcf.
4. Maximum Moisture Absorption: 1.0 percent by volume.
5. Moisture Vapor Permeability: 0.05 perm inch, when tested in accordance with ASTM E96/E96M.
6. Connection: Contact adhesive.

2.6 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturers:

1. Aeroflex USA: www.aeroflexusa.com/#sle.
2. Armacell LLC: www.armacell.us/#sle.
3. K-Flex USA LLC: www.kflexusa.com/#sle.
4. Substitutions: See Section 22 0500 - Plumbing General Provisions.

- B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
 - 1. Minimum Service Temperature: Minus 40 degrees F.
 - 2. Maximum Service Temperature: 220 degrees F.
 - 3. Connection: Waterproof vapor barrier adhesive.

2.7 JACKETING AND ACCESSORIES

A. PVC Plastic Jacket:

- 1. Manufacturers:
 - a. Johns Manville Corporation: www.jm.com/#sle.
 - b. Substitutions: See Section 22 0500 - Plumbing General Provisions .
- 2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil, 0.010 inch.
 - e. Connections: Brush on welding adhesive.

B. ABS Plastic Jacket:

- 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: Minus 40 degrees F.
 - b. Maximum Service Temperature: 180 degrees F.
 - c. Moisture Vapor Permeability: 0.012 perm inch, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 30 mil, 0.03 inch.
 - e. Connections: Brush on welding adhesive.

C. Reinforced Tape:

- 1. FSK tape suitable for sealing seams between insulation, insulated pipe bends, and fittings resulting in a tight, smooth surface without wrinkles.

2. Comply with UL 723 or ASTM E84.
3. Moisture Vapor Permeability: 0.00 perm inch, when tested in accordance with ASTM E96/E96M.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- F. Glass fiber insulated pipes conveying fluids above ambient temperature:
 1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- G. Inserts and Shields:
 1. Application: Piping 1-1/2 inches diameter or larger.
 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 3. Insert Location: Between support shield and piping and under the finish jacket.
 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

- H. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400
 - 1. At fire separations, terminate insulation at fire-rated wall and partition penetrations.
- I. Fire-Barrier Penetration Protection:
 - 1. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.
 - 2. Provide intumescent collars, wraps, fire bands, sealants, and other firestopping materials as required to maintain the fire ratings for the piping and insulation materials used.
 - 3. Install Fire Stop Systems per the manufacturers guidelines.

3.2 SCHEDULES

- A. Domestic Hot Water Supply:
 - 1. Glass Fiber Insulation: Aboveground.
 - 2. Elastomeric Celular Insulation: Aboveground and belowground.
 - 3. 1-1/4" diameter pipe and smaller: 1-1/2" thick, R-6 minimum.
 - 4. 1-1/2" diameter pipe and larger: 2" thick, R-8 minimum.
- B. Domestic Cold Water:
 - 1. Glass Fiber Insulation: Aboveground.
 - 2. Elastomeric Celular Insulation: Aboveground and belowground.
 - 3. 1-1/4" diameter pipe and smaller: 1" thick, R-4 minimum.
 - 4. 1-1/2" diameter pipe and larger: 1-1/2" thick, R-6 minimum.
 - 5. Plastic Piping, ceiling plenum spaces:
 - a. Combustible pipe insulation.

END OF SECTION

**SECTION 22 1005
PLUMBING PIPING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sanitary waste piping, buried within 5 feet of building.
- B. Sanitary waste piping, above grade.
- C. Domestic water piping, buried within 5 feet of building.
- D. Domestic water piping, above grade.
- E. Pipe flanges, unions, and couplings.
- F. Pipe hangers and supports.
- G. Ball valves.

1.2 RELATED REQUIREMENTS

- A. Section 31 2316 - Excavation.

1.3 REFERENCE STANDARDS

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- C. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings: DWV; 2021.
- D. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings—DWV; 2022.
- E. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings; 2021.
- F. ASME B31.9 - Building Services Piping; 2025.
- G. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- H. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2025.
- I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- J. ASTM B32 - Standard Specification for Solder Metal; 2020.
- K. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.

- L. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- M. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV); 2020.
- N. ASTM B813 - Standard Specification for Water Flushable Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2024.
- O. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2023.
- P. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.
- Q. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- R. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).
- S. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2025.
- T. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).
- U. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).
- V. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- W. AWWA C606 - Grooved and Shouldered Joints; 2022.
- X. AWWA C651 - Disinfecting Water Mains; 2023.
- Y. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2020.
- Z. IAPMO (UPC) - Uniform Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- AA. IAPMO/ANSI/CAN Z1117 - Standard for Press Connections; 2022.
- BB. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.
- CC. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- DD. NSF 61 - Drinking Water System Components - Health Effects; 2024.

EE. NSF 372 - Drinking Water System Components - Lead Content; 2024.

FF. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.7 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, solder, and flux (if used), complying with NSF 61 and NSF 372; label pipe and fittings.
- B. Plenum-Installed Piping: Provide piping with flame spread index of 25 or less and smoke developed index of 50 or less when tested in accordance with ASTM E84 or UL 723.

2.2 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.3 SANITARY WASTE PIPING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A74, service weight.
 - 1. Fittings: Cast iron.

2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.
- B. Copper Tube: ASTM B306, DWV.
 1. Fittings: ASME B16.29, wrought copper, or ASME B16.23, solvent.
 2. Joints: ASTM B32, alloy Sn50 solder.
- C. PVC Pipe: ASTM D2665.
 1. Fittings: PVC.
 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.4 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Copper Pipe: ASTM B88 (ASTM B88M), Type L, drawn temper.
 1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
 2. Joints: ASTM B32, solder.

2.5 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Pipe: ASTM B88 (ASTM B88M), Type L or K, Drawn (H).
 1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
 2. Joints: ASTM B32 solder.
 3. Joints: Grooved mechanical couplings.
 4. Mechanical Press Sealed Fittings: ASME B16.51 or IAPMO/ANSI/CAN Z1117, ICC (IPC), and IAPMO (UPC) approved, NSF 61 and NSF 372 certified, with EPDM seals.
 - a. Manufacturers:
 - 1) Anvil International: www.anvilintl.com/#sle.
 - 2) Apollo Valves: www.apollovalves.com/#sle.
 - 3) NIBCO, Inc.
 - 4) Substitutions: See Section 22 0500 - Plumbing General Provisions.

2.6 PIPE FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 inch and Under:
 1. Ferrous Pipe: Class 150 malleable iron threaded unions.
 2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Sizes Over 1 inch:

1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
 2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
1. Dimensions and Testing: In accordance with AWWA C606.
 2. Housing Material: Provide ASTM A47/A47M malleable iron, ductile iron, or _____, galvanized.
 3. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
 4. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
 5. When pipe is field grooved, provide coupling manufacturer's grooving tools.
 6. Manufacturers:
 - a. Anvil International: www.anvilintl.com/#sle.
 - b. Apollo Valves: www.apollovalves.com/#sle.
 - c. Victaulic Company: www.victaulic.com/#sle.
 - d. Substitutions: See Section 22 0500 - Plumbing General Provisions.
- D. No-Hub Couplings:
1. Testing: In accordance with ASTM C1277 and CISPI 310.
 2. Gasket Material: Neoprene complying with ASTM C564.
 3. Band Material: Stainless steel.
 4. Eyelet Material: Stainless steel.

2.7 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 3. Trapeze Hangers: Welded steel channel frames attached to structure.

4. Vertical Pipe Support: Steel riser clamp.
 5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
 6. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
 - a. Bases: High-density polypropylene.
 - b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - c. Steel Components: Stainless steel or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 - d. Attachment and Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion-resistant material.
 - e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.
- B. Plumbing Piping - Drain, Waste, and Vent:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
 2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
 3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
 4. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.
 5. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
 2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
 3. Wall Support for Pipe Sizes Up to 3 inch: Cast iron hook.
 4. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 5. Floor Support for Hot Pipe Sizes to 4 inch: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.

2.8 BALL VALVES

- A. Manufacturers:

1. Anvil International: www.anvilintl.com/#sle.
 2. Apollo Valves: www.apollovalves.com/#sle.
 3. Victaulic Company: www.victaulic.com/#sle.
 4. Uponor, Inc: www.uponorengineering.com/#sle.
 5. Milwaukee Valve Company.
 6. Nexus Valve.
 7. NIBCO INC.
 8. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 9. Viega, LLC.
 10. Substitutions: See Section 22 0500 - Plumbing General Provisions.
- B. Construction, 4 inch and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded or grooved ends with union.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.

- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not exposed.
- H. Establish elevations of buried piping outside the building.
 - 1. Not less than 8 ft of cover for domestic water piping.
 - 2. Not less than 5 ft of cover for waste piping except where otherwise noted on the Drawings.
- I. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
- J. Provide support for utility meters in accordance with requirements of utility companies.
- K. Excavate and backfill in accordance with Division 31.
- L. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- M. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- N. Sleeve pipes passing through partitions, walls, and floors.
- O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified.
- P. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Support horizontal piping as indicated.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 - 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 7. Provide copper plated hangers and supports for copper piping.
 - 8. Support cast iron drainage piping at every joint.

- Q. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.4 APPLICATION

- A. Use grooved mechanical couplings and fasteners only in accessible locations.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Provide flow controls in water recirculating systems where indicated.

3.5 FIELD TESTS AND INSPECTIONS

- A. Verify and inspect systems according to requirements by the Authority Having Jurisdiction. In the absence of specific test and inspection procedures proceed as indicated below.
- B. Domestic Water Systems:
 - 1. Perform testing for leakage prior to system disinfection.
 - 2. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
 - 3. General: Pressure test at minimum of 125 psi for two hours.
- C. Sewer, Soil, Waste, Drain and Vent Piping:
 - 1. Procedure: Close all openings and pressurize with air.
 - 2. Pressure: Minimum of 5 psig.
 - 3. Duration: 15 minutes.
 - 4. System may be tested in its entirety or in sections.
- D. Test Results: Document and certify successful results, otherwise repair, document, and retest.

3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Clean interior of domestic water, septic, and vent piping systems. Remove dirt and debris as work progresses. Prior to starting work, verify system is complete, flushed, and clean.
- B. New potable water systems shall be disinfected prior to use whenever required by the Authority having jurisdiction. The method to be followed shall be that prescribed by the Health Authority or, in case no method is prescribed by the Health Authority, the following: Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.

1. Flush piping system with clean, potable water until dirty water does not appear at outlets.
2. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
3. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
4. Maintain disinfectant in system for 24 hours.
5. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
6. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
7. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.7 SERVICE CONNECTIONS

- A. Provide new sanitary sewer services. Before commencing work, check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.
- B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves, pressure reducing valve, and sand strainer.

3.8 SCHEDULES

A. Pipe Hanger Spacing:

1. Metal Piping:
 - a. Pipe Size: 1/2 inch to 1-1/4 inch:
 - 1) Maximum Hanger Spacing: 6.5 ft.
 - 2) Hanger Rod Diameter: 3/8 inches.
 - b. Pipe Size: 1-1/2 inch to 2 inch:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.
 - c. Pipe Size: 2-1/2 inch to 3 inch:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 1/2 inch.
2. Plastic Piping:
 - a. All Sizes:
 - 1) Maximum Hanger Spacing: 6 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.

END OF SECTION

**SECTION 22 1006
PLUMBING PIPING SPECIALTIES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Drains.
- B. Cleanouts.
- C. Hose bibbs.
- D. Hydrants.
- E. Double check valve assemblies.
- F. Water hammer arrestors.
- G. Sanitary waste interceptors.
- H. Relief valves.

1.2 REFERENCE STANDARDS

- A. ASME A112.6.3 - Floor Drains; 2022.
- B. ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent; 2021.
- C. ASSE 1015 - Performance Requirements for Double Check Backflow Prevention Assemblies; 2021.
- D. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2023.
- E. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- F. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- G. PDI-WH 201 - Water Hammer Arresters; 2017.

1.3 SUBMITTALS

- A. See Section 22 0500 - Plumbing General Provisions for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
- D. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

- E. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- F. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, and water hammer arrestors.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Loose Keys for Outside Hose Bibbs: One.
 - 2. Extra Hose End Vacuum Breakers for Hose Bibbs: One.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.2 DRAINS

- A. Manufacturers:
 - 1. Josam Company: www.josam.com/#sle.
 - 2. MIFAB, Inc: www.mifab.com/#sle.
 - 3. Sioux Chief Manufacturing.
 - 4. Watts Drainage Products.
 - 5. Zurn Industries, LLC: www.zurn.com/#sle.
 - 6. Substitutions: See Section 22 0500 - Plumbing General Provisions.
- B. Floor Drains:
 - 1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer.
 - 2. Pre-packaged shims for tilt correction.
 - 3. Above Grade Drain Bodies: Provide flashing materials of 8" minimum wider in all directions from drain body.
- C. Floor Sink:
 - 1. Square lacquered cast iron body with integral seepage pan, epoxy coated interior, aluminum dome strainer, nickel bronze frame, half grate.

2.3 CLEANOUTS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
2. Josam Company: www.josam.com/#sle.
3. MIFAB, Inc: www.mifab.com/#sle.
4. Sioux Chief Manufacturing Company, Inc.
5. Watts Drainage Products.
6. Zurn Industries, LLC: www.zurn.com/#sle.
7. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Cleanouts at Exterior Surfaced Areas:

1. Round cast nickel bronze access frame and non-skid cover.

C. Cleanouts at Exterior Unsurfaced Areas:

1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.

D. Cleanouts at Interior Finished Floor Areas:

1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.

E. Cleanouts at Interior Finished Wall Areas:

1. Soil pipe test tee body, match material to connected piping.
2. Raised head, threaded plug.
3. Round stainless steel access cover secured with machine screw.

2.4 HOSE BIBBS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
2. Watts Regulator Company: www.wattsregulator.com/#sle.
3. Zurn Industries, LLC: www.zurn.com/#sle.
4. Substitutions: See Section 22 0500 - Plumbing General Provisions.

2.5 HYDRANTS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
2. WADE: www.wadedrains.com/#sle.
3. Zurn Industries, LLC: www.zurn.com/#sle.
4. Substitutions: .See Section 22 0500 - Plumbing General Provisions.

B. Wall Hydrants:

1. ASSE 1019; freeze resistant, self-draining type with finish as scheduled, hose thread spout, and integral vacuum breaker.
 - a. Operation: As scheduled. For loose key, provide one key with each hydrant.

2.6 DOUBLE CHECK-VALVE ASSEMBLIES

A. Manufacturers:

1. Apollo Valves: www.apollovalves.com/#sle.
2. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com/#sle.
3. Zurn Industries, LLC; 350AST: www.zurn.com/#sle.
4. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Double Check Valve Assembly:

1. ASSE 1012; cast bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.
2. Size: 3/4 to 2 inch, NPS assembly with threaded full port ball valves.

C. Double Check Valve Assembly:

1. ASSE 1015 and NSF 61 compliant lead-free bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.
2. Size: 3/4 to 2 inch, NPS assembly with threaded full port ball valves.

2.7 WATER HAMMER ARRESTORS

A. Manufacturers:

1. AMTROL, Inc.

2. Josam Company.
3. Sioux Chief Manufacturing Company, Inc.
4. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
5. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com/#sle.
6. Tyler Pipe; Wade Div.
7. Zurn Industries, LLC: www.zurn.com/#sle.
8. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Water Hammer Arrestors:

1. Copper construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.

2.8 SANITARY WASTE INTERCEPTORS

A. Manufacturers:

1. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
2. MIFAB, Inc: www.mifab.com/#sle.
3. Zurn Industries, LLC: www.zurn.com/#sle.
4. Substitutions: See Section 22 0500 - Plumbing General Provisions .

B. Grease Interceptors:

1. Construction:
 - a. Material: High-density polyethylene.
 - b. Rough-in: Fully recessed (shallow rough-in) with anchor flange.
 - c. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.
2. Additional Manufacturers:
 - a. Schier Products.
 - b. Substitutions: See Section 22 0500 - Plumbing General Provisions.

2.9 RELIEF VALVES

A. Manufacturers:

1. ITT Bell & Gossett: www.bellgossett.com/#sle.
2. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.
- C. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to fast closing valves such as flush valves.

3.2 DRAINS

- A. Protect drains during construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Floor Drains:
 - 1. Set grates flush with finished floor, unless otherwise indicated.
 - 2. Size same as drainage piping.
 - 3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

3.3 CLEANOUTS

- A. Extend cleanouts to finished floor or wall surface.
- B. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil.
 - 1. Ensure clearance at cleanout for rodding of drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Floor Cleanouts: Install at elevation to accommodate finished floor.
- E. Wall Cleanouts: Install chrome access covers.

F. Location:

1. At each aggregate change in direction of piping greater than 135 degrees.
2. Intervals of 75 feet, minimum.
3. At base of each vertical soil and waste stack.

G. Sizing Schedule, unless otherwise indicated:

1. Up to 4" Drain Pipe : Size same as drainage piping.
2. Above 4" up to 6": 4" cleanout.

3.4 SANITARY WASTE INTERCEPTORS

- A. Interceptor mounted flush with concrete floor shall be furnished by this Contractor and turned over to the General Contractor for installation. This Contractor shall provide all piping and accessories.
- B. It is this Contractor's responsibility to field verify all piping inverts into and out of the interceptors to provide the correct extension/riser lengths to maintain the scheduled minimum solid and liquid capacities. Extension/riser lengths shall not result in reduced interceptor capacity.
- C. Unless otherwise noted, install cleanouts at the inlets and outlets of all interceptors.
- D. Install all interceptors with clear space for servicing.
- E. Grease Interceptors:
 1. Install grease interceptors, including trapping, venting, and flow-control fitting, according to authorities having jurisdiction and with clear space for servicing.
 2. Flush with Floor Installation: Set unit and extension, if required, with cover flush with finished floor.
 3. Install cleanout immediately downstream from interceptors not having integral cleanout on outlet.

END OF SECTION

SECTION 22 3000 PLUMBING EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Residential gas-fired water heaters.
- B. Potable water expansion tanks.
- C. In-line circulator pumps.

1.2 REFERENCE STANDARDS

- A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels; 2025, with Errata .

1.3 SUBMITTALS

- A. See Section 22 0500 - Plumbing General Provisions for submittals procedures.
- B. Product Data:
 - 1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
 - 2. Provide electrical characteristics and connection requirements.
- C. Shop Drawings:
 - 1. Indicate dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.
- D. Project Record Documents: Record actual locations of components.
- E. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.5 WARRANTY

A. Water Heaters

1. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship for not less than one year from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 WATER HEATERS

A. Manufacturers:

1. A.O. Smith Water Products Co: www.hotwater.com/#sle.
2. Bock Water Heaters, Inc: www.bockwaterheaters.com/#sle.
3. Bradford White Corporation.
4. Rheem Manufacturing Company: www.rheem.com/#sle.
5. State Water Heaters.
6. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Residential Gas-Fired Water Heaters:

1. Type: Automatic, natural gas-fired, vertical storage.
2. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
3. Performance: As scheduled.
4. Tank: Glass lined welded steel with single flue passage, flue baffle and draft hood; thermally insulated and encased in corrosion-resistant steel jacket; baked-on enamel finish; floor shield and legs.
5. Controls: Automatic water thermostat and built-in gas pressure regulator; temperature range adjustable from 120 to 170 degrees F, cast iron or sheet metal burner, safety pilot and thermocouple.
6. Accessories:
 - a. Water Connections: Brass.
 - b. Dip Tube: Brass.
 - c. Drain valve.
 - d. Anode: Magnesium.

- e. Temperature and Pressure Relief Valve: ASME labeled.

2.2 POTABLE WATER EXPANSION TANKS

A. Manufacturers:

1. Amtrol Inc: www.amtrol.com/#sle.
2. Armstrong Pumps, Inc.
3. Bell & Gossett, a brand of Xylem, Inc: www.bellgossett.com/#sle.
4. Taco, Inc: www.taco-hvac.com/#sle.
5. Wilkins.
6. Watts.
7. American Wheatley, a company of Global Flow Products, LLC; _____ :
www.wheatleyhvac.com/#sle.
8. Substitutions: See Section 22 0500 - Plumbing General Provisions.

- B. Construction: Welded steel, tested and rated for working pressure of 125 psig, with flexible EPDM diaphragm sealed into tank.

- C. Accessories: Pressure gauge and air-charging fitting, tank drain; precharge to 12 psig.

2.3 CIRCULATOR PUMPS

A. Manufacturers:

1. Armstrong Fluid Technology: www.armstrongfluidtechnology.com/#sle.
2. Bell & Gossett, a brand of Xylem, Inc: www.bellgossett.com/#sle.
3. Grundfos Pumps Corporation: www.grundfos.com/#sle.
4. Taco, Inc: www.tacocomfort.com/#sle.
5. Thrush Company.
6. Wilo USA, LLC.
7. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Wet Rotor Circulators:

1. Casing: Bronze with NPT, union, or flanged connections.
2. Impeller: Non-metallic.

3. Pump Shaft: Ceramic.
 4. Pump Bearings: Carbon.
 5. Motor: Single or multi-speed stainless steel replaceable cartridge design.
- C. Controls: Provide aquastat set for high-temp cutoff, electric plug, and illuminated hand switch.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions required for applicable certifications.
- B. Equipment Connections:
- C. Pumps:
1. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.
 2. Hot Water Recirculation Pumps:
 - a. Install thermostats in hot-water return piping.
 - b. Install timers in accessible location on wall near hot water heater.
 - c. Adjust domestic water pumps to function smoothly and lubricate as recommended by manufacturer.
 - d. Adjust initial temperature set points.

3.2 WATER HEATERS

- A. If any device, fixture, or panel is required to be wall mounted by this contractor, provide AC Plywood, 3/4" or 5/8" thickness, painted both sides with fireproof paint, color to be determined and coordinated with owner. Paint is required even if installed on a non-fire rated wall.
- B. Residential, Water Heater Mounting: Install residential, water heaters on floor, or on water-heater stand on floor if required to be elevated 18".
- C. Install water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances.
1. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

2. Install shutoff valves on water-supply piping to water heaters and on hot-water outlet piping.
 3. Where installing piping adjacent to water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of water heaters.
- D. Install gas-fired water heaters according to NFPA 54.
1. Install gas shutoff valves on gas supply piping to gas-fired water heaters.
 2. Install condensate drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

3.3 FIELD QUALITY CONTROL

A. Cleaning:

1. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, use procedure described in section 22 0500 - Plumbing General Provisions.

END OF SECTION

**SECTION 22 4000
PLUMBING FIXTURES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flush valve water closets.
- B. Wall hung urinals.
- C. Lavatories.
- D. Under-lavatory pipe supply covers.
- E. Mop sinks.

1.2 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).
- C. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
- D. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
- E. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2024.
- F. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2022.
- G. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
- H. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- I. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- J. NSF 372 - Drinking Water System Components - Lead Content; 2024.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty for electric water cooler.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.2 FLUSH VALVE WATER CLOSETS

A. Water Closets:

1. Vitreous china, ASME A112.19.2, floor mounted, siphon jet flush action, china bolt caps.
2. Bowl: ASME A112.19.2; elongated rim.
 - a. ADA Rim Height: 17"
 - b. Standard Rim Height: 15"
3. Flush Valve: Exposed (top spud).
4. Flush Operation: Manual, oscillating handle.
5. Handle Height: 44 inches or less.
6. Color: White.
7. Manufacturers:
 - a. American Standard, Inc: www.americanstandard-us.com/#sle.
 - b. Kohler Company: www.kohler.com/#sle.
 - c. Mansfield Plumbing Products LLC: www.mansfieldplumbing.com/#sle.
 - d. Zurn Industries, LLC: www.zurn.com/#sle.
 - e. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Flush Valves:

1. Manufacturers:
 - a. American Standard, Inc: www.americanstandard-us.com/#sle.

- b. Delany Products: www.delanyproducts.com/#sle.
 - c. Sloan Valve Company: www.sloanvalve.com/#sle.
 - d. Zurn Industries, LLC: www.zurn.com/#sle.
 - e. Substitutions: See Section 22 0500 - Plumbing General Provisions.
2. Manual Operated:
- a. Type: ASME A112.18.1 or ASME A112.19.5; diaphragm type complete with vacuum breaker stops, and accessories.
 - b. Supplied Volume Capacity: 1.5 gal per flush.
3. Exposed Type: Chrome-plated, escutcheon, integral screwdriver stop.
- C. Toilet Seats:
1. Manufacturers:
- a. American Standard, Inc: www.americanstandard-us.com/#sle.
 - b. Bemis Manufacturing Company: www.bemismfg.com/#sle.
 - c. Church Seat Company: www.churchseats.com/#sle.
 - d. PROFLO: www.ferguson.com/#sle.
 - e. Zurn Industries, LLC: www.zurn.com/#sle.
 - f. Substitutions: See Section 22 0500 - Plumbing General Provisions.
2. Plastic: Black finish, open front, extended back, self-sustaining hinge, brass bolts, with cover.
- D. Water Closet Carriers:
1. Manufacturers:
- a. Grohe America, Inc: www.grohe.com/us/#sle.
 - b. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
 - c. JOSAM Company: www.josam.com/#sle.
 - d. Zurn Industries, LLC: www.zurn.com/#sle.
 - e. Watts Drainage.
 - f. Substitutions: See Section 22 0500 - Plumbing General Provisions.

2. ASME A112.6.1M; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

2.3 WALL HUNG URINALS

A. Manufacturers:

1. Crane.
2. American Standard, Inc: www.americanstandard-us.com/#sle.
3. Kohler Company: www.kohler.com/#sle.
4. PROFLO: www.ferguson.com/#sle.
5. Zurn Industries, LLC: www.zurn.com/#sle.
6. Sloan.
7. Toto.
8. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Vitreous china, ASME A112.19.2, wall hung with side shields and concealed carrier.

1. Consumption Volume: 1.0 gal per flush, maximum.
2. Flush Valve: Exposed (top spud).
3. Flush Operation: Sensor operated.
4. Trapway Outlet: Integral.

C. Flush Valves:

1. Manufacturers:

- a. American Standard, Inc: www.americanstandard-us.com/#sle.
- b. Delany Products: www.delanyproducts.com/#sle.
- c. Sloan Valve Company: www.sloanvalve.com/#sle.
- d. Zurn Industries, LLC: www.zurn.com/#sle.
- e. Substitutions: See Section 22 0500 - Plumbing General Provisions.

2. Manual Operated:

- a. Type: ASME A112.18.1 or ASME A112.19.5; diaphragm type, complete with vacuum breaker stops, and accessories.

- b. Supplied Volume Capacity: 1.5 gal per flush.

D. Urinal Carriers:

1. Manufacturers:

- a. Jay R. Smith Manufacturing Company: www.jrsmith.com/#sle.
- b. JOSAM Company: www.josam.com/#sle.
- c. Zurn Industries, LLC: www.zurn.com/#sle.
- d. Watts Drainage.
- e. Substitutions: See Section 22 0500 - Plumbing General Provisions.

- 2. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

2.4 LAVATORIES

A. Manufacturers:

- 1. American Standard, Inc: www.americanstandard-us.com/#sle.
- 2. Kohler Company: www.kohler.com/#sle.
- 3. Mansfield Plumbing Products LLC: www.mansfieldplumbing.com/#sle.
- 4. Zurn Industries, LLC: www.zurn.com/#sle.
- 5. Toto.
- 6. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. Wall-Hung Basin:

- 1. Vitreous China, Grade A: ASME A112.19.2; white, rectangular commercial-grade sink with predrilled holes, rear-center drain, front overflow, and hanger. Size as indicated on drawings with 4-inch centerset spacing.
- 2. Carrier:
 - a. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded studs for fixture hanger, bearing plate and studs.
 - b. Manufacturers:
 - 1) Jay R. Smith MFG. Co: www.jrsmith.com/#sle.
 - 2) JOSAM Company: www.josam.com/#sle.
 - 3) Zurn Industries, LLC: www.zurn.com/#sle.
 - 4) Watts Drainage.

5) Substitutions: See Section 22 0500 - Plumbing General Provisions.

C. Undermount Basin:

1. Vitreous China: ASME A112.19.2; self-rimming, white, square shape, front overflow, soap depression, seal of putty, caulking, or concealed vinyl gasket, and white finish. Size as indicated on drawings with 4-inch centerset spacing.

D. Supply Faucet:

1. Deck Mounted Faucet Manufacturers:

- a. American Standard, Inc: www.americanstandard-us.com/#sle.
- b. Grohe America, Inc: www.grohe.com/us/#sle.
- c. Kohler Company: www.kohler.com/#sle.
- d. PROFLO: www.ferguson.com/#sle.
- e. Zurn Industries, LLC: www.zurn.com/#sle.
- f. Chicago Faucets.
- g. Delta Faucet Company.
- h. Elkay.
- i. Just Manufacturing.
- j. Moen Incorporated.
- k. Substitutions: See Section 22 0500 - Plumbing General Provisions.

2. ASME A112.18.1; chrome plated combination supply fitting with pop-up waste, water economy aerator with maximum flow of 2.2 gpm, indexed handles.
3. Single-Lever Handle, Supply Faucet: ASME A112.18.1; deck-mount, ceramic cartridge disc valve, and maximum flow of 1.2 gpm.

E. Thermostatic Mixing Valve:

1. ASSE 1070 listed with combination stop, strainer, and check valves, and flexible stainless steel connectors.
2. Braided hot and cold water supply lines.

F. Accessories:

1. Offset waste with perforated open strainer.
2. Wheel handle stops.

2.5 UNDER-LAVATORY PIPE SUPPLY COVERS

A. Manufacturers:

1. Plumberex Specialty Products, Inc: www.plumberex.com/#sle.
2. Engineered Brass Company.
3. Insul-Tect Products Co.; a subsidiary of MVG Molded Products.
4. McGuire Manufacturing.
5. Truebro; a brand of IPS Corporation.
6. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
7. Substitutions: See Section 22 0500 - Plumbing General Provisions.

B. General:

1. Insulate exposed drainage piping including hot, cold and tempered water supplies under lavatories or sinks per ADA Standards.
2. Exterior Surfaces: Smooth nonabsorbent with no finger recessed indentations for easy cleaning.
3. Construction: 1/8 inch PVC with antimicrobial, antifungal and UV resistant properties.
 - a. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
 - b. Comply with ICC A117.1.
4. Color: White.
5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces. No cable ties allowed.

2.6 MOP SINKS

A. Sink Manufacturers:

1. Zurn Industries, LLC: www.zurn.com/#sle.
2. Ferguson Enterprises, Inc.; ProFlo Brand.
3. Fiat Products.
4. Florestone Products Co., Inc.
5. Mustee, E. L., & Sons, Inc.
6. Swan Corporation.

7. Substitutions: See Section 22 0500 - Plumbing General Provisions.
- B. Material: Cast polymer composite, white.
- C. Material: Precast terrazzo composed of marble chips cast in Portland cement.
- D. Type: Rectilinear.
- E. Tiling Flange Construction: Galvanized steel.
- F. Grid Strainer: Dome stainless steel; integral; removable.
- G. Dimensions: As indicated on drawings.
- H. Accessories:
 1. 5 feet of 1/2 inch diameter plain end reinforced plastic hose.
 2. Hose clamp hanger.
 3. Mop hanger.
 4. 12" stainless splash guard.
- I. Faucet:
 1. Standard: ASME A112.18.1/CSA B125.1.
 2. General: Include hot- and cold-water indicators.
 - a. Material: Commercial, solid brass.
 - b. Finish: Polished chrome plate.
 - c. Check Stops: Provide on hot and cold water.
 3. Mounting Type: Back/wall, exposed.
 4. Valve Handle(s):
 - a. Non-ADA: 2-inch lever.
 5. Spout: Rigid, pail-hook, wall brace.
 - a. Vacuum Breaker: Required for hose outlet.
 - b. Spout Outlet: 3/4" hose thread.
 6. Provide hose bibb with backflow preventer for connection to chemical dispenser. See detail on Drawings.
- J. Faucet Manufacturers:

1. American Standard.
2. Cambridge Brass, Inc.
3. Chicago Faucets.
4. Component Hardware Group, Inc.
5. Delta Faucet Company.
6. Elkay.
7. Grohe America, Inc.
8. Just Manufacturing.
9. Kohler.
10. Moen Incorporated.
11. Sloan.
12. T & S Brass and Bronze Works, Inc.
13. Zurn.
14. Substitutions: See Section 22 0500 - Plumbing General Provisions.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.2 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome-plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install water supply piping connections. Provide stop on each supply in readily-serviceable location.
- D. Install components level and plumb.
- E. Install and secure fixtures in place with wall supports and bolts.

- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
- G. Install deep-pattern escutcheons if required to conceal protruding fittings.
- H. Seal joints between fixtures and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant to fixture color.
- I. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks and lavatories.

3.3 WATER CLOSETS

- A. Install toilet seats on water closets.

3.4 LAVATORIES

- A. Install water temperature limiting devices on all public lavatories.
- B. Install supports, affixed to building substrate, for wall-mounted lavatories.

3.5 INTERFACE WITH WORK OF OTHER SECTIONS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.6 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
- B. Operate and adjust fixtures and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- C. Adjust water pressure at bubblers, faucets and flushometer valves to produce proper flow.

3.7 CLEANING

- A. Clean plumbing fixtures and equipment.

3.8 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 23 0500
HVAC GENERAL PROVISIONS

PART 1 GENERAL

1.1 SUMMARY

A. Specification Format

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
 - a. "Part 1 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
 - b. "Part 2 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
 - c. "Part 3 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions:

1. **Furnish:** Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. **Install:** Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. **Or Approved Equal:** Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. **Or Equivalent:** Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. **Provide:** Furnish and install in place, total and operational.

6. Complete/Completely: All pipes, fittings, ducts, wiring supplies, and accessories provided for the noted equipment from the equipment to the mains or noted termination points.

1.2 SCOPE OF WORK

- A. The work covered by this Division consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of the HVAC systems, in strict accordance with Division 23 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.
- B. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.
- C. Examine site and all Contract documents prior to submittal of bid.
 1. Submittal of a Bid shall indicate the Contractor has examined the Site and Drawings and has included all required allowances in this Bid. No allowance shall be made for errors resulting from the Contractor's failure to visit job sites and to review Drawings.
- D. Division 23 Work: Includes, but is not limited to, providing the following:
 1. Air Distribution System: Equipment and ductwork.
 2. Ventilation and Exhaust System: Equipment and ductwork.
 3. HVAC Control System.
 4. Insulation System: Ductwork and piping.

1.3 ALTERNATES

- A. Refer to Division 1 for alternates.
- B. General
 1. The work of this Section is affected by the Alternates described in Division 1.

1.4 CONTINGENCY

- A. Refer to Division 01 for amount to include in Mechanical Bid.

1.5 SUBMITTALS

- A. General:
 1. Preferred Submittal Format: PDF, unless otherwise noted.
 2. Preferred Submittal Nomenclature: Unless otherwise noted, PDF submittals are to be named according to the following:

- a. [Specification Section Number] – [Specification Name or Equipment Included]
3. Distribution: Unless otherwise noted, direct all correspondence concerning Division 23 submittals to:
 - a. Justin Byrne
 - b. PRAIRIE ENGINEERING, P.C.
 - c. 1905 17TH STREET SE
 - d. MINOT, ND 58701
 - e. jbyrne@prairieengineeringpc.com
- B. Substitution and Prior Approval to Quote:
 1. Format and Content: Complete descriptive technical data on the proposed item consisting of model numbers, type, size and performance characteristics.
 2. Submission Timing: Minimum of 192 hours (eight days) prior to bid opening.
 - a. Substitutions will not be permitted after bid opening except where such substitution is considered by the Engineer to be in the best interest of the Owner.
 3. Bidder Notification: Prior to bid opening via Addenda, sent to all planholders.
 4. Contractor Responsibility: This contractor will be responsible for all coordination, construction costs, and Architectural/Engineering design fees required to substitute equipment that has different characteristics than designed including weights, physical dimensions, clearances, mechanical characteristics, electrical characteristics, and other characteristics deemed important to the design by the Architect/Engineer.
 5. Alternative Format: Printed paper, two copies; Self-addressed, stamped envelope required for return reply.
- C. Schedule of Values
 1. Distribution: One copy to Engineer.
 2. Format and Content: When included with the Bid, at minimum the following categories shall be indicated:
 - a. "Project mobilization"
 - b. "Start-up and Commissioning"
 - c. "Demolition"
 - d. "Excavation and Backfill"
 - e. "Insulation"

- f. "Test and Balance"
- g. "Building Automation System"
- h. "Fire Sprinkler System"
- i. "Sheet Metal" (all ductwork, lining, dampers, hangers, installed in place)
- j. "Terminal Units" (unit heaters, grilles, diffusers, radiation, installed in place)
- k. "Air Distribution Equipment" (all fans, air handlers, heat pumps, VAVs, installed in place)

- 3. Submission Timing: Prior to first payment application.

D. Shop Drawings

- 1. Distribution: Engineer via the Prime Contractor for each item indicated.
- 2. Format and Content: Include catalog numbers, performance data, dimensions and other descriptive information.
 - a. Contractor Review: Dated and signed cover sheet or review stamp for each Shop Drawing file to indicate thorough review. Email message text not acceptable.
 - b. Submit a separate shop drawing file for each Specification Section including only the items within that Section.
 - c. Non-Conforming: Returned to Contractor without review.
- 3. Submission Timing: Prior to delivery of materials to job site.

E. Record Drawings

- 1. Format and Content: Paper copy of Drawings project site.
 - a. As work progresses, Contractor's field supervisor shall mark Record Drawings in red pencil to indicate actual conditions of installation.
 - b. Give particular attention to marking actual locations of underground piping.
 - c. Affix all addendum and change order descriptions to appropriate record drawing sheet, utilizing spray adhesive.
 - d. Make Record Drawings available to Engineer during project visitation.
- 2. Submission Timing: Close of project with Record Manuals.

F. Spare Equipment and Devices

- 1. Distribution: Owner.

2. Format and Content: List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
3. Submission Timing: Close of project with Record Manuals.

G. Operation and Maintenance Manuals

1. Submission Timing: Close of project, as condition of its acceptance.
2. Record Manual information shall be included for all equipment/material where Shop Drawings are required.
3. Format and Content: Two copies, Loose-leaf hardcover binders, and in PDF format on CDs or USB drive.
 - a. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual and CD.
 - b. Include an index sheet indicating subcontractor and subcontractor's phone number and each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
 - c. Include a copy of the Shop Drawings.
 - d. Include all installation, operation and maintenance data packaged with any equipment.
 - e. Include all signed and dated final punch lists from walkthroughs performed by the Engineer.

1.6 APPLICATIONS FOR PAYMENT

- A. Refer to Division 1 "Applications for Payment".
- B. Provide one additional copy, sent directly to the Engineer.
- C. Schedule of Values: At minimum, include items in Submittal article.

1.7 CHANGES TO CONTRACT

- A. Any required changes to the contract after bid date shall be in accordance with General Conditions/Division 1 and this section. Where any discrepancies between the sections are encountered, the more restrictive section shall apply.
- B. Proposed changes shall be accompanied with complete substantiating documentation.
 1. Provide an itemized list of quantities for materials, equipment, and supplies.
 - a. Include unit costs for each item and extended price.
 - b. Include unit labor for each item and extended time.

2. Provide subcontractor proposals that include the same substantiating documentation.
 3. Provide quotations from suppliers for any specially ordered equipment.
- C. Material costs shall be actual costs to the contractor, obtaining the materials through normal supply channels, including trade and quantity discounts. Utilizing “suggested pricing” from national pricing organizations for unit costs shall not be accepted. Upon request, the contractor or subcontractor shall submit evidence to substantiate the costs.
 - D. Labor units shall be industry accepted standard labor hours to perform one unit of work. If the work is being performed in a location that is not considered to be standard working conditions for that specific task, additional labor shall be itemized.
 - E. Labor rates shall be the actual rate paid for the workman category along with associated labor burden. Labor burden shall consist only of the mandatory fringe benefits, labor taxes, and labor insurances as affected by payroll. The owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the fringe benefit cost is in excess of established labor agreements.
 - F. Additional costs for travel and subsistence shall only be allowed if the proposal includes a request for extension of the completion date. Furthermore, those costs shall be proportional to the number of working days of the extension.
 - G. Subcontractors shall compute their costs in the same manner as the contractor. Subcontractors are subject to the same markup constraints as described herein.
 - H. For changes resulting in credit to the costs, no restocking fees for materials shall be applied by the contractor or subcontractors.

1.8 QUALITY ASSURANCE

- A. Qualifications of Installers
 1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
 2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.

1.9 AUTHORITIES AND AGENCIES

- A. Materials, workmanship and installation: comply with the latest editions of all applicable codes, local ordinances, industry standards, utility company regulations, insurance carrier requirements and these Specifications.
- B. Obtain and pay all permits, inspections, licenses and other charges pertaining to the Work. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.
- C. Codes and standards shall include, but not necessarily be limited to, the following:
 1. International Energy Conservation Code (IECC);

2. Uniform Plumbing Code;
 3. North Dakota State Building Code;
 4. International Building Code (IBC);
 5. International Mechanical Code (IMC);
 6. International Fuel Gas Code (IFC);
 7. National Fire Protection Association (NFPA) – Sections as adopted by authority having jurisdiction.
- D. The more stringent provisions shall govern where provisions of pertinent codes and standards conflict with these Specifications or Drawings. Where Codes, Specifications or Drawings differ with one another, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies to the Engineer immediately.
1. Pertinent codes and standards shall not be cited to furnish less than specifically shown or specified.
 2. Meeting the minimum standards of the above Codes does not permit a lower grade of construction where Plans or Specifications call for workmanship or materials in excess of Code Requirements.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.10 GUARANTEE AND WARRANTY

- A. Except where otherwise noted, contractor shall guarantee materials, workmanship and the proper operation of equipment for a period of one year after Owner's beneficial use of the building or mechanical system. Contractor shall correct all equipment, material and workmanship found to be defective or non-conforming to the contract documents without cost to Owner during that one year period.
- B. Guarantee shall include trips to the project site by Contractor to adjust mechanical equipment as required, ensuring it is operating as intended.
- C. Specified guarantee shall not relieve Contractor from liability arising from improper installation or non-compliance with applicable codes.

1.11 TEMPORARY FACILITIES

- A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

1.12 NOMENCLATURE

- A. Pipe sizes listed are nominal pipe sizes throughout this Division except where otherwise noted.

PART 2 PRODUCTS**2.1 MATERIAL**

- A. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.
- B. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.
- C. Fire Stop System material shall be by 3M "Fire Barrier", Metacaulk, Hilti, Nelson Firestop Products, or AD Fire.
- D. See Division 07 for further details on approved materials.

2.2 ELECTRIC WIRING

- A. The Division 23 Contractor shall furnish all motors, special controls and electrical devices as specified herein for proper operation of the equipment furnished.
- B. Division 26 Contractor shall furnish and install, as required, disconnects, starters, switches, etc., and do all necessary power and control wiring including the installation of electrical devices such as thermostats, humidistats, remote control panels, etc., furnished separately by Division 23 Contractor, unless otherwise noted in Equipment Specifications or noted in Section 230900.

PART 3 EXECUTION**3.1 GENERAL**

- A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.
- B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.
- C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.
- D. In general, it is intended that ductwork and piping be installed parallel to building lines, unless otherwise shown on the Drawings, and that equipment be located symmetrical with the architectural elements of the building.

3.2 SURFACE CONDITIONS

- A. Prior to work of each Section of Division 23, 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.
- B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.
- B. Plugs: Install in ends of uncompleted piping at end of each day or when work stops.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

3.4 COORDINATION

- A. Order equipment and material in a timely fashion to assure it is on the job site when required.
- B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.
- C. Division 23 piping, duct and equipment installations shall comply with National Electrical Code requirements 110.26 "working spaces" and "dedicated spaces". Mechanical ducts and pipes shall not be installed in the space near electrical panels/equipment defined as "working spaces" or "dedicated spaces".

3.5 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

- A. Discrepancies
 - 1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
 - 2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
 - 3. Written interpretation or clarification will be made by Addenda.
- B. Construction Conflicts
 - 1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.
 - 2. Do not proceed with installation in area of question until conflict has been fully resolved.
 - 3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.
- C. Drawings
 - 1. Drawings indicate extent and general layout of mechanical systems for project. Due to small scale, it is not possible to indicate all fittings and accessories that may be

required. Provide such fittings and accessories as required to form a complete and operating system in general conformance with Specifications and Drawings.

2. Exact locations, distances, levels and other conditions will be governed by the structure. Field measurements shall take precedence over the Drawings. Use the Drawings and these Specifications for guidance. Secure the Architect's approval for all changes in locations.
3. Verify all measurements at site. No compensation will be made because of difference between locations shown on the Drawings and measurements at the building.
4. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.6 UNDERGROUND UTILITIES

- A. Locations of existing underground utilities are based on available site information and are shown approximately. Contractor shall determine exact utility locations before commencing work and shall be responsible for repair of damages resulting from his construction activities to pre-construction condition.
- B. Trench and backfill for installation of underground piping to depth shown or required. Remove any accumulated water in excavation by pumping. Shore and brace excavation as required by safety regulations. Provide temporary bridges to maintain normal traffic flow. Excavation and backfill required by mechanical installations shall be accomplished in accordance with Division 31 Specifications by this Contractor.

3.7 REMOVAL AND/OR REUSE OF EXISTING MATERIALS AND EQUIPMENT

- A. Existing equipment, which is indicated as being removed and not indicated for reuse, shall remain the property of the Owner, stored as directed. Any material the Owner does not wish to retain shall be removed and disposed by the Contractor.
- B. Contractor shall assume in his Bid that existing equipment and materials shown to be reused are in good working condition and can be installed without any repairs. If certain items are found to be in need of repair or in unusable condition, Contractor shall notify the Engineer for decision, however, Contractor shall be responsible for any damage by his personnel to equipment in removal or handling.
- C. All refrigeration equipment and piping to be removed or relocated shall have the refrigerant removed prior to removal or demolition. Removal and reclamation of refrigerant shall be done by qualified, trained and certified refrigeration technicians. Certification shall meet all requirements as set forth by Section 608 of the Clean Air Act Amendments. Contractor shall use approved recovery and reclaiming equipment and approved containers for refrigerant storage. Flashing refrigerant gas to atmosphere is strictly prohibited.
- D. Material and other equipment removed and to be reused shall be cleaned before reinstallation.

3.8 OFFSETS

- A. Where required to allow clearance of electrical conduit and outlet boxes, beams, etc., to avoid interference with work of other trades, to increase head room under mechanical systems or to improve the appearance of mechanical systems work, this Contractor shall offset his mechanical system as directed by the Architect/Engineer.

3.9 CUTTING AND PATCHING

- A. Refer to General Conditions. Unless specifically called out to be performed by other Contractors, the Division 23 Contractor shall perform all cutting and patching required for the installation of material and equipment furnished under his Contract.
- B. Opening/holes cut to allow passage of ducts and pipes through concrete floor shall be patched by the Contractor doing the cutting unless indicated otherwise on the Drawings.
- C. Fire-Barrier Penetrations
 - 1. Pipe penetrations through fire rated walls and floors shall be sealed with a UL classified Fire Stop System. Fire Stops shall be provided in accordance with the appropriate System No. as it relates to pipe size/Material and wall or floor rating/material.
 - 2. See Specification Section 230510 for other Fire-Barrier Penetration requirements.
 - 3. See Section 2 article "Materials" of this Specification for approved fire stop system material.
- D. Openings between ductwork and fire rated walls and floors shall be sealed with fire rated caulking or steel collars on both sides of wall or floor.
- E. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.
- F. Use only rotary type drilling tools to cut concrete.
- G. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.10 FIELD QUALITY CONTROL

- A. Perform field tests and inspections. Test new piping and parts of existing piping that have been altered, extended, or repaired.
- B. Gas Piping Tests:
 - 1. Test gas piping as required by the Authority Having Jurisdiction or the Utility Company.
 - 2. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.

- C. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained. Piping will be considered defective if it does not pass tests and inspections.

3.11 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Air Systems shall be adjusted as follows:
 - 1. The ventilation and/or cooling system installed by this Contractor shall be tested and adjusted by this Contractor to demonstrate that the system performs as intended and that the air quantities, as shown on the Drawings, can be met. Balancing will be primarily done at the fans by adjustment of fan speeds to achieve the desired air flow.
 - 2. Volume dampers, air extractors and splitter dampers shall be adjusted to obtain the required air flow in the branch ductwork. Adjustment of dampers at the neck of registers and diffusers will be done only for final trim balancing of the system. All final air quantities shall be plus or minus 10% of the figures shown on the Drawings.
 - 3. A complete Balancing Report shall be submitted to the Engineer upon job completion to indicate the following:
 - a. Register or diffuser location, rated CFM and actual CFM.
 - b. Air handler rated and actual CFM, rate and actual motor amperage, fan RPM and system static pressure.
 - c. Exhaust or supply fan rated and actual CFM, fan RPM and system static pressure, motor rated and actual amperage.

3.12 CLEANING

- A. Clean interior of duct systems. Remove dirt and debris as work progresses.

3.13 INSTRUCTIONS

- A. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Instructions to include all building's mechanical systems and equipment.
- B. Copies of written operating and maintenance instructions shall be included with each Record Manual.

- C. Division 23 Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment. Provide similar equipment supplier's instructions where specified thus.
- D. Formal instructions shall be video recorded when required by other Sections of this Specification by this Contractor. Format shall be DVD. Formal instruction to be included with each Record Manual, being referenced to and a part of the Manual.

3.14 CLEAN UP

- A. Each Contractor shall be responsible for cleaning up after his work, including the removal of all scrap material left on the job by his men or Subcontractors. This will include the removal of all pipe and sheet metal cuttings, pieces of sheet metal, pipe, and insulation and other debris.
- B. Clean all heating units, clean and straighten fins on all coils, clean scale, dirt or debris off piping, motors, etc., oil or grease all motors, fan bearings, pump gear boxes, etc., and leave in a clean best possible working condition. Install clean filters in ventilation system prior to turning job over to Owner.
- C. After all tests have been made and the mechanical systems are operating properly, this Contractor shall go over the entire system and remove labels from all mechanical equipment.
- D. All equipment having finished paint surfaces shall be examined upon completion for scratches and other damage. Touch up all surfaces as required with paint of color to match factory finish.
- E. Perform all cleaning as required by other Sections of Division 23.

END OF SECTION

SECTION 23 0513
COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General construction and requirements.
- B. Applications.
- C. Single phase electric motors.
- D. Three phase electric motors.
- E. Shaft grounding rings.
- F. Electronically Commutated Motors (ECM).

1.2 RELATED REQUIREMENTS

- A. Section 26 2913 - Enclosed Controllers.

1.3 REFERENCE STANDARDS

- A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015 (Reaffirmed 2020).
- B. IEEE 112 - IEEE Standard Test Procedure for Polyphase Induction Motors and Generators; 2017.
- C. NEMA MG 00001 - Motors and Generators; 2024.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Provide submittals for loose-shipped motors.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with NEMA MG 1 unless otherwise indicated.

1.6 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty for motors larger than 20 horsepower.

- C. Provide three year manufacturer warranty for premium efficiency motors.
- D. Provide 5 year manufacturer warranty for severe duty motors.

PART 2 PRODUCTS

2.1 GENERAL CONSTRUCTION AND REQUIREMENTS

- A. Duty: Continuous duty at ambient temperature of 105 °F and at altitude of 1,700 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
- C. Nominal Efficiency:
 - 1. Open Motor with Two Poles: 82.5.
 - 2. Open Motor with Four Poles: 82.5.
 - 3. Open Motor with Six Poles: 50.0.
 - 4. Enclosed Motor with Two Poles: 75.5.
 - 5. Enclosed Motor with Four Poles: 82.5.
 - 6. Enclosed Motor with Six Poles: 50.0.
- D. Construction:
 - 1. Open drip-proof type except where specifically noted otherwise.
 - 2. Design for continuous operation in 104 degrees F environment.
 - 3. Design for temperature rise in accordance with NEMA MG 00001 limits for insulation class, service factor, and motor enclosure type.
- E. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
- F. Wiring Terminations:
 - 1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
 - 2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

- G. Single Phase Motor Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation.

- 1. Automatic reset when motor temperature returns to normal range.

2.2 APPLICATIONS

- A. Exception: Motors less than 250 watts, for intermittent service may be the equipment manufacturer's standard and need not comply with these specifications.
- B. Single phase motors for shaft mounted fans, oil burners, and centrifugal pumps: Split phase type.
- C. Single phase motors for shaft mounted fans or blowers: Permanent split capacitor type.
- D. Single phase motors for fans, pumps, blowers, and air compressors: Capacitor start type.
- E. Single phase motors for fans, blowers, and pumps: Capacitor start, capacitor run type.
- F. Motors located in outdoors, in wet air streams downstream of sprayed coil dehumidifiers, in draw through cooling towers, and in humidifiers: Totally enclosed weatherproof epoxy-treated type.

2.3 SINGLE PHASE POWER - SPLIT PHASE MOTORS

- A. Starting Current: Up to seven times full load current.
- B. Breakdown Torque: Approximately 200 percent of full load torque.
- C. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.
- D. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

2.4 SINGLE PHASE POWER - PERMANENT-SPLIT CAPACITOR MOTORS

- A. Multiple Speed: Through tapped windings.
- B. Open Drip-proof or Enclosed Air Over Enclosure: Class A (50 degrees C temperature rise) insulation, minimum 1.0 Service Factor, prelubricated sleeve or ball bearings, automatic reset overload protector.

2.5 SINGLE PHASE POWER - CAPACITOR START MOTORS

- A. Pull-up Torque: Up to 350 percent of full load torque.
- B. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.

- C. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve bearings.
- D. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

2.6 THREE PHASE POWER - SQUIRREL CAGE MOTORS

- A. Design, Construction, Testing, and Performance: Comply with NEMA MG 00001 for Design B motors.
- B. Insulation System: NEMA Class B or better.
- C. Testing Procedure: In accordance with IEEE 112. Load test motors to determine free from electrical or mechanical defects in compliance with performance data.
- D. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
- E. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid state control relay for wiring into motor starter; refer to Section 26 2913.
- F. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum ABMA STD 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- G. Sound Power Levels: To NEMA MG 00001.
- H. Weatherproof Epoxy Sealed Motors: Epoxy seal windings using vacuum and pressure with rotor and starter surfaces protected with epoxy enamel; bearings double shielded with waterproof non-washing grease.
- I. Nominal Efficiency: As indicated at full load and rated voltage when tested in accordance with IEEE 112.
- J. Nominal Power Factor: As indicated at full load and rated voltage when tested in accordance with IEEE 112.
- K. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

2.7 ELECTRONICALLY COMMUTATED MOTORS (ECM)

- A. Description: Brushless DC motor with built in speed and torque controls.
- B. Rotor: Permanent magnet.
- C. Circuitry: Programmable, manage commutation of stator to be always synchronous with rotor.

- D. Multispeed Motors: Minimum turndown of 80%.
- E. Efficiency: Minimum of 65%.
- F. Bearings: Permanently lubricated, heavy duty ball bearings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION

**SECTION 23 0529
HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Support and attachment components.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
2. Coordinate the work with other trades to provide additional framing and materials required for installation.
3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

- B. Sequencing:

1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.

PART 2 PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:

1. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
2. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be

supported with a minimum safety factor of 2.5. Include consideration for vibration, equipment operation, and shock loads where applicable.

3. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
 - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Strut Channels:

1. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.
2. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.

C. Channel Nuts:

1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring.

D. Hanger Rods:

1. Threaded zinc-plated steel unless otherwise indicated.

E. Cable Hanging System Kits:

1. Provide cable-wire in bulk or precut lengths with respective cable hangers as required to hold minimum weight of 120 lb.

F. Beam Clamps:

1. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.
2. Beam C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
3. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
4. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.

5. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
6. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish,
7. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
8. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.

G. Riser Clamps:

1. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
2. MSS SP-58 type 1 or 8, carbon steel or steel with epoxy plated, plain, stainless steel, or zinc plated finish.
3. Medium Split Horizontal Pipe Clamp: MSS SP-58 type 4, carbon steel or stainless steel with epoxy plated, plain, stainless steel, or zinc plated finish.
4. Copper Tube Pipe Clamp: MSS SP-58 type 8, epoxy plated copper.
5. UL (DIR) listed: Pipe sizes 1/2 to 8 inch.

H. Strut Clamps:

1. Pipe Clamp: Two-piece rigid, universal, or outer diameter type, carbon steel with epoxy copper or zinc finish.

I. Insulation Clamps:

1. Two bolt-type clamps designed for installation under insulation.
2. Material: Carbon steel with epoxy copper or zinc finish.

J. Pipe Hangers:

1. Split Ring Hangers:
 - a. Provide hinged split ring and yoke roller hanger with epoxy copper or plain finish.
 - b. Material: ASTM A47/A47M malleable iron or ASTM A36/A36M carbon steel.
 - c. Provide hanger rod and nuts of the same type and material for a given pipe run.
 - d. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.
2. Band Hangers, Adjustable:

- a. MSS SP-58 Type 7 or 9, Zinc-plated ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.

K. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- C. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- D. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- F. Equipment Support and Attachment:
 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- G. Secure fasteners according to manufacturer's recommended torque settings.
- H. Remove temporary supports.

END OF SECTION

SECTION 23 0553
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tags.
- B. Adhesive-backed duct markers.
- C. Stencils.
- D. Pipe markers.
- E. Ceiling tacks.

1.2 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.1 IDENTIFICATION APPLICATIONS

- A. Air Handling Units: Nameplates.
- B. Dampers: Ceiling tacks, where located above lay-in ceiling.
- C. Ductwork: Stencils or adhesive-backed labels.
- D. Small-sized Equipment: Tags.

2.2 NAMEPLATES

- A. Letter Color: White.
- B. Letter Height: 1/4 inch.
- C. Background Color: Black.

2.3 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.4 ADHESIVE-BACKED DUCT MARKERS

- A. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.
- B. Style: Individual Label.
- C. Color: Yellow/Black.

2.5 STENCILS

- A. Stencils: With clean cut symbols and letters of following size:
 - 1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
 - 2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
 - 3. 2-1/2 and up Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
 - 4. Ductwork and Equipment: 2-1/2 inch high letters.

2.6 PIPE MARKERS

- A. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- B. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
- C. Underground Plastic Pipe Markers: Bright-colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.

2.7 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Install plastic pipe markers in accordance with manufacturer's instructions.

- D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- E. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- F. Use tags on piping 3/4 inch diameter and smaller.
 - 1. Identify service, flow direction, and pressure.
 - 2. Install in clear view and align with axis of piping.
 - 3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- G. Install ductwork with labels. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
- H. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Testing, adjustment, and balancing of air systems.
- B. Measurement of final operating condition of HVAC systems.

1.2 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, adjusting, and balancing.
- D. TABB: Testing, Adjusting, and Balancing Bureau.
- E. TAB Specialist: An entity engaged to perform TAB Work.

1.3 PROJECT CONDITIONS

- A. Partial Owner Occupancy: Owner may occupy completed areas of building before completion of test and balance. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.
- B. Much of the work will need to occur after occupied hours. All costs to perform the work at night or weekends shall be included in bidding this work.

1.4 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2024, with Errata (2025).
- C. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2023.

1.5 QUALITY ASSURANCE

- A. Division 23 Contractor shall employ an independent TAB Contractor specializing in total system air and hydronic testing and balancing.
 - 1. All personnel involved in the execution of the work under the TAB Contract shall be experienced and factory-trained specifically in the total balancing of mechanical systems, as well as being regular employees of the TAB Contractor.
- B. The following contractors have been pre-approved to bid the TAB work:

1. Air Dynamics; Granville, ND.
 2. Balancing Professionals; Fargo, ND.
 3. CL Linfoot; Grand Forks, ND.
 4. Design Control, Inc.; Fargo, ND.
 5. McFarlane, Inc.; Grand Forks, ND.
- C. Calibrate all instruments and provide verification of calibration provided with submittal data.

1.6 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
 6. Include the following on the title page of each report:
 - a. Name of Testing, Adjusting, and Balancing Agency.
 - b. Address of Testing, Adjusting, and Balancing Agency.
 - c. Telephone number of Testing, Adjusting, and Balancing Agency.
 - d. Project name.
 - e. Project location.
 - f. Project Engineer.
 - g. Project Contractor.
 - h. Report date.
- C. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

1.7 WARRANTY

- A. The TAB agency shall provide an extended 90-day warranty after the completion of the TAB work, during which time the Owner or Engineer can request a rebalancing and retesting of any component listed in the report. The TAB agency shall provide a technician to assist the Owner and/or Engineer in making any tests they may require during this time period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
 - 3. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

3.2 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.

10. Air outlets are installed and connected.
 11. Duct system leakage is minimized.
- B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
 - C. Beginning of work means acceptance of existing conditions.

3.3 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.4 RECORDING AND ADJUSTING

- A. Field Logs: Maintain written logs including:
 1. Running log of events and issues.
 2. Discrepancies, deficient or uncompleted work by others.
 3. Contract interpretation requests.
 4. Lists of completed tests.
- B. Ensure recorded data represents actual measured or observed conditions.
- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.5 GENERAL PROCEDURES

- A. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- B. Verify interlocked systems are operating in conjunction.
- C. Take and report testing and balancing measurements in inch-pound (IP) units.
- D. Report deficiencies discovered before and during performance of testing, adjusting and balancing procedures.

- E. Provide assistance to mechanical contractor to troubleshoot systems with deficiencies outside the allowable limits set in this Specification.

3.6 AIR SYSTEM PROCEDURE

- A. System Diagrams: Include schematic layouts of air distribution systems. Present each system with minimum single-line diagram.
- B. Cut insulation for installation of test probes to the minimum extent necessary for TAB procedures.
 - 1. Install and join new insulation that matches removed materials.
- C. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts. Rubber or metal snap-in plugs are also acceptable.
- D. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- E. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- F. Measure air quantities at air inlets and outlets.
- G. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- H. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- I. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- J. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- K. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- L. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- M. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- N. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.

- O. Verify that thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and heat generating appliances.

3.7 SCOPE

- A. New systems: All components listed below.
- B. Test, adjust, and balance the following:
 - 1. Plumbing Pumps.
 - 2. Direct Fired Furnaces.
 - 3. Packaged Roof Top Heating/Cooling Units.
 - 4. Fans.
 - 5. Air Inlets and Outlets.

3.8 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
 - 1. Manufacturer.
 - 2. Model/Frame.
 - 3. HP/BHP.
 - 4. Phase, voltage, amperage; nameplate, actual, no load.
 - 5. RPM.
 - 6. Sheave Make/Size/Bore.
- B. V-Belt Drives:
 - 1. Identification/location.
 - 2. Required driven RPM.
 - 3. Driven sheave, diameter and RPM.
 - 4. Belt, size and quantity.
 - 5. Motor sheave diameter and RPM.
- C. Air Cooled Condensers:
 - 1. Identification/number.
 - 2. Location.

3. Manufacturer.

4. Model number.

5. Serial number.

D. Air Moving Equipment:

1. Location.

2. Manufacturer.

3. Model number.

4. Serial number.

5. Arrangement/Class/Discharge.

6. Air flow, specified and actual.

7. Return air flow, specified and actual.

8. Outside air flow, specified and actual.

9. Total static pressure (total external), specified and actual.

10. Sheave Make/Size/Bore.

11. Number of Belts/Make/Size.

12. Fan RPM.

E. Exhaust Fans:

1. Location.

2. Manufacturer.

3. Model number.

4. Serial number.

5. Air flow, specified and actual.

6. Total static pressure (total external), specified and actual.

7. Sheave Make/Size/Bore.

8. Number of Belts/Make/Size.

9. Fan RPM.

F. Air Distribution Tests:

1. Air terminal number.
2. Room number/location.
3. Terminal type.
4. Terminal size.
5. Design air flow.
6. Test (final) air flow.
7. Percent of design air flow.

END OF SECTION

**SECTION 23 0713
DUCT INSULATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Duct insulation.

1.2 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.2 GLASS FIBER, FLEXIBLE

- A. Manufacturer:
 - 1. CertainTeed Corporation: www.certainteed.com/#sle.
 - 2. Johns Manville: www.jm.com/#sle.
 - 3. Knauf Insulation: www.knaufinsulation.com/#sle.
 - 4. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - 5. Substitutions: See Section 23 0500 - HVAC General Provisions.
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure-sensitive tape.
- D. Vapor Barrier Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.

- E. Indoor Vapor Barrier Mastic:
 - 1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.
- F. Outdoor Vapor Barrier Mastic:
 - 1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

2.3 GLASS FIBER, RIGID

- A. Manufacturer:
 - 1. CertainTeed Corporation: www.certainteed.com/#sle.
 - 2. Johns Manville: www.jm.com/#sle.
 - 3. Knauf Insulation: www.knaufinsulation.com/#sle.
 - 4. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
- B. Insulation: ASTM C612; rigid, noncombustible blanket.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure-sensitive tape.
- D. Vapor Barrier Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.
- E. Indoor Vapor Barrier Finish:
 - 1. Cloth: Untreated; 9 oz/sq yd weight, glass fabric.
 - 2. Vinyl emulsion type acrylic, compatible with insulation, black color.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Insulated Ducts Conveying Air Below Ambient Temperature:
 - 1. Provide insulation with vapor barrier jackets.

2. Finish with tape and vapor barrier jacket.
3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

3.2 WALL AND FLOOR PENETRATIONS

- A. Roof/Wall Penetrations: Install insulation continuously through roof/wall penetrations.
 1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof/wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside flashing at least 2 inches.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. Fire-Rated Wall and Partition Penetrations:
 1. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
- D. Floor Penetrations:
 1. For penetrations through fire-rated assemblies, insulate with same procedure as with Fire-Rated Walls.
- E. Fire-Barrier Penetrations:
 1. Maintain indicated fire rating of walls, partitions, ceilings, and floors at duct penetrations. Seal duct penetrations with Approved firestop materials.
 2. Each Penetration shall be sealed by a Certified Installer, or this Contractor is to hire a Certified Installer to perform fire sealing.
 3. Each Penetration is to include a legible, permanent label that has the following information:
 - a. UL listing
 - b. Product used
 - c. Name of installer

- d. Name of Contracting Company
- e. Date the seal was installed

3.3 FIRE-RATED INSULATION SYSTEM INSTALLATION

- A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.
- B. Insulate duct access panels and doors to achieve same fire rating as duct.
- C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Division 07.

3.4 SCHEDULES

- A. Fiberglass wrap, with FSK jacket:
 - 1. Supply-Air Ducts and Plenums in attics, concealed spaces and unconditioned spaces.
 - 2. Tempered-Fresh-Air Ducts in attic spaces.
 - 3. Exhaust-Air Ducts and Plenums between isolation damper and penetration of building exterior.
 - a. Exception: Lined Exhaust-Air Duct from power roof ventilators.
 - 4. Dishwasher Exhaust-Air Duct back 10' from roof exhaust fan.
 - 5. Return-Air Duct and Plenums in attic spaces.
 - 6. Tempered-Fresh-Air Duct and Plenums in spaces other than attic.
 - 7. Un-tempered Fresh-Air Duct from air-to-air heat exchangers.
- B. Minimum Duct Insulation R-Values
 - 1. Supply ducts, installed in unheated attics and exterior: R-12.
 - 2. Supply ducts, installed in unconditioned spaces, ceiling plenums, and crawl spaces: R-6.
 - a. Exception: Cooling only supply ducts: R-2.
 - 3. Supply ducts, installed in attic with roof insulation: R-2.
 - 4. Return ducts, installed in unheated attics: R-4.
 - 5. Outside air ducts: R-12.
 - 6. Un-tempered Fresh-Air Ducts: R-4.

C. Insulation not required:

1. Exhaust-Air Duct except as otherwise
2. Return-Air Duct and Plenums in indirectly conditioned spaces.
3. Supply-Air Ducts and Plenums in exposed, conditioned spaces.
4. Factory-insulated flexible ducts.
5. Factory-insulated plenums and casings.
6. Flexible connectors.
7. Factory-insulated access panels and doors.
8. Listed grease ducts.

END OF SECTION

SECTION 23 1100
FACILITY LIQUEFIED-PETROLEUM SUPPLY STATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pressure regulators.
- B. Storage containers.
- C. Vaporizers.

1.2 RELATED REQUIREMENTS

- A. Section 23 1126 - Facility Liquefied-Petroleum Gas Piping .

1.3 AUTHORITIES AND AGENCIES

- A. Obtain and pay all permits, inspections, licenses and other charges for large above ground tanks as required by the State Fire Marshal. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.

1.4 SUBMITTALS

- A. Shop Drawings: For equipment covered under this section as per Section 230500.
 - 1. Product Data: For each type of the following:
 - a. Pressure regulators. Indicate pressure ratings and capacities.
 - b. Storage containers.
 - c. Vaporizers.
- B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1.5 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 PRODUCTS

2.1 PRESSURE REGULATORS

- A. Description: Designed to reduce LP gas container pressures to between 3 and 125 PSIG.

B. Manufacturers:

1. RegO Products.
2. Fisher; Emerson Electric Company.
3. Marshall Excelsior Company.
4. Substitutions: See Section 23 0500 - HVAC General Provisions.

C. Materials:

1. Body and Bonnet: Corrosion resistant metal.
2. Nozzle Orifice: Brass.
3. Spring: Steel.
4. Valve Seat Discs: Resilient rubber.
5. Diaphragms: Integrated fabric and synthetic rubber.

D. Overpressure Protection Device: Factory mounted on pressure regulator.**E. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.****2.2 STORAGE CONTAINERS****A. Description: Factory fabricated, complying with requirements in NFPA 58 and ASME Boiler and Pressure Vessel Code and bearing the ASME label. Tanks shall be rated for 250-psig minimum working pressure.****B. Manufacturers:**

1. American Welding and Tank Co.
2. Trinity Industries, Inc.
3. Quality Steel Corporation
4. TransTech Energy, LLC
5. Ransome Manufacturing
6. Substitutions: See Section 23 0500 - HVAC General Provisions.

C. Accessories: Provide all required including pressure relief devices, shutoff valves, check valves, internal valves, and pressure gauges.**D. Exposed Metal Surfaces, Outdoor Installation: Mechanically cleaned, primed, and painted for resistance to corrosion.**

- E. Stainless-Steel Nameplate: Attach to aboveground storage container or to adjacent structure for underground storage container.

2.3 VAPORIZERS

- A. Description: Factory-fabricated, -assembled, and -tested vaporizer with heat exchanger sealed pressure-tight, built on a steel base; including insulated jacket, flue-gas vent, liquid fuel supply and vapor connections, and controls. Assembly shall be FMG labeled and comply with NFPA 58 and NFPA 70.
- B. Manufacturers:
 - 1. Algas SDI; Torrex.
 - 2. Ransome Manufacturing; RE Series.
 - 3. Substitutions: See Section 23 0500 - HVAC General Provisions.
- C. Casing:
 - 1. Mineral-fiber insulation, a minimum of 2 inches (50 mm) thick, surrounding the heat exchanger.
 - 2. Sheet metal jacket with screw-fastened closures and baked-enamel or powder-coat protective finish.
 - 3. Mounting base to secure boiler to concrete base.
 - 4. Control Compartment Enclosure: NEMA 250, Type 4, enclosure housing control panels for LPG-fired vaporizers. Explosion-proof control compartment construction required for electric vaporizers.
- D. LPG Liquid and Vapor Circuit Specialties:
 - 1. Vaporizer coil safety pressure relief valve.
 - 2. Vapor outlet isolation valve.
 - 3. Inlet safety solenoid valve to close with off-normal operation alarm.
 - 4. Liquid carryover or float-type safety shutoff switch.

PART 3 EXECUTION

3.1 STORAGE CONTAINER INSTALLATION

- A. Install piping connections with swing joints or flexible connectors to allow for storage container settlement and for thermal expansion and contraction.
- B. Ground containers according to NFPA 780.

3.2 VAPORIZER INSTALLATION

- A. Install vaporizer with access space for periodic maintenance.
- B. Set vaporizers on and anchor to concrete base.
- C. Connect liquid line from pump set, and vapor supply to distribution piping.
- D. Install backup connection from vapor space of container to inlet of pressure-regulating valve at vaporizer discharge to bypass the vaporizer during maintenance. Install shutoff valves to change source from vaporizer to storage container.

3.3 FIELD QUALITY CONTROL

- A. Test, inspect, and purge LPG according to NFPA 58 and NFPA 54 and requirements of authorities having jurisdiction.
- B. LPG piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION

SECTION 23 1126
FACILITY LIQUEFIED-PETROLEUM GAS PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe, pipe fittings, valves, and connections for propane gas piping systems.

1.2 REFERENCE STANDARDS

- A. ANSI LC 1/CSA 6.26 - Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing; 2023.
- B. ANSI Z21.18/CSA 6.3 - Gas Appliance Pressure Regulators; 2019.
- C. ANSI Z21.80/CSA 6.22 - Line Pressure Regulators; 2019.
- D. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- F. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- G. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2024.
- H. ASME B31.1 - Power Piping; 2024.
- I. ASME B31.9 - Building Services Piping; 2025.
- J. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- K. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- L. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2025.
- M. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- N. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- P. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.
- Q. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).

- R. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry; 2018, with Editorial Revision (2020).
- S. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
- T. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.
- U. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- V. NFPA 58 - Liquefied Petroleum Gas Code; 2024, with Amendment.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.
- D. Project Record Documents: Record actual locations of valves.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.6 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.1 PROPANE GAS PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Copper Tube: ASTM B88 (ASTM B88M), Type K (A) annealed.
 - 1. Fittings: ASME B16.26, cast bronze.

2. Joints: Flared.

2.2 PROPANE GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.

1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
2. Joints: NFPA 58, threaded or welded to ASME B31.1.

- B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A) annealed.

1. Fittings: ASME B16.26, cast bronze.
2. Joints: Flared.

- C. Copper Tube: Listed, ASTM B88 (ASTM B88M), Type K (A), annealed.

1. Fittings: ASME B16.18 cast copper or ASME B16.22 wrought copper.
2. Joints: Compression connection or AWS A5.8M/A5.8, BCuP silver braze.
3. Mechanical Press Sealed Fittings: Double-pressed type and approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.

- D. Flexible Gas Piping:

1. Corrugated Stainless Steel Tubing: Comply with ANSI LC 1/CSA 6.26.
2. Comply with ASTM E84.
3. Fittings: Provided by piping system manufacturer.
4. Provide piping with integral lightning protection.
5. Manufacturers:
 - a. Omega Flex, Inc; TracPipe CounterStrike: www.omegaflex.com/#sle.
 - b. Parker Hannifin Corporation; Parflex Division.
 - c. Titeflex.
 - d. Tru-Flex Metal Hose Corp.
 - e. Substitutions: See Section 23 0500 - HVAC General Provisions.

2.3 FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 2 Inches and Under:

1. Ferrous Pipe: Class 150 malleable iron threaded unions.
 2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Size Over 2 Inch:
1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
 2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Welded Fittings:
1. Systems with gas pressure 2 psi and higher.
 2. Ferrous piping larger than 2".
 3. Ferrous piping in inaccessible areas.
- D. Cold Press Mechanical Joint Fittings:
1. Manufacturer: Viega.
 2. Conform to requirements of ASTM A420 or ASME B16.3 and performance criteria ANSI LC-4/CSA 6.32.
 3. Piping: Schedule 10 to 40 carbon steel pipe, conforming to ASTM A53 and A106.
 4. Pipe Sizes: ½" to 4".
 5. Systems: Gas pressure 5 psi and lower.
 6. Sealing Elements: HNBR, factory installed or an alternative supplied by fitting manufacturer.
 7. Leakage Path: Press ends shall assure leakage of fluids from inside the system past the sealing element of unpressed connections to alert installer of unpressed connections.

2.4 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 4. Vertical Pipe Support: Steel riser clamp.

5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
6. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
 - a. Bases: High density polypropylene.
 - b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - c. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 - d. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
 - e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.
 - f. Manufacturers:
 - 1) Cooper B-Line.
 - 2) C-Port; Clearline Technologies.
 - 3) C-Port; MIFAB.
 - 4) Erico.
 - 5) Substitutions: See Section 23 0500 - HVAC General Provisions.
- B. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
 1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 2. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
 3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
 4. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
 5. Other Types: As required.

2.5 BALL VALVES

- A. Manufacturers:
 1. Apollo Valves; _____: www.apollovalves.com/#sle.
 2. Grinnell Products; _____: www.grinnell.com/#sle.
 3. Milwaukee Valve Company; _____: www.milwaukeevalve.com/#sle.
 4. Nibco, Inc; _____: www.nibco.com/#sle.
 5. Anvil International; _____: www.anvilintl.com/#sle.

6. Nexus Valve.
 7. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 8. Viega, LLC.
 9. Substitutions: See Section 23 0500 - HVAC General Provisions.
- B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder or threaded ends with union.

2.6 STRAINERS

A. Manufacturers:

1. Armstrong International, Inc; _____: www.armstronginternational.com/#sle.
2. Maxitrol.
3. Substitutions: See Section 23 0500 - HVAC General Provisions.

B. Size 2 inch and Under:

1. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
2. Class 150, threaded bronze body 300 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.

C. Size 1-1/2 inch to 4 inch:

1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

2.7 LINE PRESSURE REGULATORS AND APPLIANCE REGULATORS INDICATORS

A. Manufacturers:

1. Maxitrol Company; _____: www.maxitrol.com/#sle.
2. RegO Products.
3. Fisher; Emerson Electric Company.
4. Marshall Excelsior Company.
5. Substitutions: See Section 23 0500 - HVAC General Provisions.

B. Compliance Requirements:

1. Appliance Regulator: ANSI Z21.18/CSA 6.3.

2. Line Pressure Regulator: ANSI Z21.80/CSA 6.22.
- C. Materials in Contact With Gas:
1. Housing: Aluminum, steel (free of non-ferrous metals).
 2. Seals and Diaphragms: NBR-based rubber.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Entire installation shall comply with NFPA pamphlet No. 54 entitled "Gas Appliance and Gas Piping" and NFPA 58 Liquefied Petroleum Gas Code.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not exposed.
- H. Install valves with stems upright or horizontal, not inverted.
- I. Connect branch piping from top or side of horizontal piping.
- J. Pipe vents from gas pressure reducing valves to outdoors and terminate in weather proof hood.
- K. Do not use propane piping as grounding electrode.
- L. Install strainer on inlet of each electrically operated valve.
- M. Sleeve pipes passing through partitions, walls and floors.
- N. Pipe Hangers and Supports:
1. Install in accordance with ASME B31.9.
 2. Support horizontal piping as indicated.

3. Place hangers within 12 inches of each horizontal elbow.
 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 6. Provide copper plated hangers and supports for copper piping.
- O. Install propane piping electrically continuous and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
1. Corrugated stainless steel tubing (CSST) shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream CSST fitting. The bonding jumper shall not be smaller than 6 AWG copper wire or equivalent.
- P. Prime and paint all exterior ferrous metal piping to protect from corrosion.

3.3 PRESSURE REGULATORS

- A. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- B. Provide regulators at appliances as required.
- C. Install strainer on inlet of each line-pressure regulator.

3.4 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.
1. Construct sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 6 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- E. Provide strainer of size equivalent to pipe shown on the drawings. Locate the filter after sediment trap and before the regulator. Install per the manufacturer instructions and per NFPA 85 and NFPA 86 requirements.

3.5 SERVICE CONNECTIONS

- A. Piping Between Tanks and Secondary Regulator:

1. Installed by LP provider as a subcontractor to the Mechanical Contractor.
 2. Tubing shall be installed in a 6" bed of sand a minimum of 18" below grade and a #14 THHN locating wire shall be buried with the pipe.
 3. Provide marker tape labeled "GAS" and bury above the propane piping 12" below grade.
- B. Prime and paint all exterior steel piping to protect from corrosion.
1. Clean piping to remove loose dirt and debris prior to applying primer. Sand any rust spots with 220-grit sandpaper; rinse pipe with water and allow to dry.
 2. Apply metal primer paint to clean exterior piping.
 3. Apply two coats of enamel-based metal topcoat paint. Allow the first coat to thoroughly dry before applying second coat.
- C. Underground copper tubing shall extend 12" above ground on all risers.

3.6 SCHEDULES

A. Pipe Hanger Spacing:

1. Metal Piping:
 - a. Pipe Size: 1/2 inches to 1-1/4 inches:
 - 1) Maximum Hanger Spacing: 6.5 ft.
 - 2) Hanger Rod Diameter: 3/8 inches.
 - b. Pipe size: 1-1/2 inches to 2 inches:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.
 - c. Pipe size: 2-1/2 inches to 3 inches:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 1/2 inch.
 - d. Pipe size: 4 inches to 6 inches:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 5/8 inch.

END OF SECTION

**SECTION 23 3100
HVAC DUCTS AND CASINGS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal ducts.
- B. Flexible ducts.
- C. Ducts for kitchen exhaust applications.

1.2 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 23 0130.51 - HVAC Air-Distribution System Cleaning: Post install duct cleaning.
- C. Section 23 0713 - Duct Insulation: External insulation and duct liner.
- D. Section 23 3319 - Duct Silencers.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- D. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- E. ASTM E2336 - Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems; 2020.
- F. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).
- G. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry; 2018, with Editorial Revision (2020).
- H. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
- I. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.
- J. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

- K. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2024.
- L. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- M. SMACNA (KVS) - Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines; 2001.
- N. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.
- O. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- P. UL 1978 - Grease Ducts; Current Edition, Including All Revisions.
- Q. UL 2221 - Tests of Fire Resistive Grease Duct Enclosure Assemblies; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. Product Data: Provide data for duct materials.
- B. Shop Drawings: Indicate duct fitting types, gauges, sizes, welds, and configuration.
- C. Submit CAD Drawings with Sizing/Balancing Calculations showing that the grease duct exhaust system is in complete compliance with Code, the hood manufacture(s), and the fan manufacture(s) installation instructions.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Provide metal duct unless otherwise indicated.
- C. Acoustical Treatment: Provide sound-absorbing liners and sectional silencers for metal-based ducts in compliance with Section 23 3319.
- D. Duct Shape and Material in accordance with Allowed Static Pressure Range:
 - 1. Round: Plus or minus 2 in-wc of galvanized steel.
 - 2. Rectangular: Plus or minus 1/2 in-wc of galvanized steel.
- E. Duct Sealing and Leakage in accordance with Static Pressure Class:
 - 1. Duct Pressure Class and Material for Common Mechanical Ventilation Applications:
 - a. Supply Air: 1/2 in-wc pressure class, galvanized steel.

- b. Return and Relief Air: 1/2 in-wc pressure class, galvanized steel.
- c. General Exhaust Air: pressure class, galvanized steel.

F. Duct Fabrication Requirements:

1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
3. Construct tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide airfoil turning vanes of perforated metal with glass fiber insulation.
4. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
5. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
6. Provide turning vanes of perforated metal with glass fiber insulation when an acoustical lining is required.
7. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.2 METAL DUCTS

A. Material Requirements:

1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

B. Round Spiral Duct:

1. Round spiral lock seam duct with galvanized steel outer wall.

C. Connectors, Fittings, Sealants, and Miscellaneous:

1. Fittings: Manufacture with solid inner wall of perforated galvanized steel.
2. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
 - a. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.

- b. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
- 3. Gasket Tape:
 - a. Provide butyl rubber gasket tape for a flexible seal between transfer duct connector (TDC), transverse duct flange (TDF), applied flange connections, and angle ring connections.
- 4. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
- 5. Hanger Fasteners: Attach hangers to structure using appropriate fasteners as follows:
 - a. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 - b. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
 - c. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
 - d. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
 - e. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
 - f. Other Types: As required.

2.3 FLEXIBLE DUCTS

A. Flexible Air Ducts:

- 1. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire.
- 2. Pressure Rating: From 10 in-wc to 1 in-wc negative.
- 3. Temperature Range: Minus 20 to 210 degrees F.

2.4 DUCTS FOR KITCHEN EXHAUST APPLICATIONS

- A. Provide ductwork, fittings, and appurtenances in accordance with NFPA 96, SMACNA (KVS), UL 1978, and UL 2221 requirements and guidelines.
- B. Class 1 duct for air with gas and grease particle exhaust at an air velocity of 1,500 to 2,500 fpm.
- C. Where ducts are not self-draining back to equipment, provide low-point drain pocket with the copper drain pipe to a sanitary sewer.
- D. Design, fabricate, and install liquidtight preventing exhaust leakage into building.
- E. Dishwasher Exhaust Duct:

1. Duct Size: 1/2 in-wc pressure class stainless steel.
 2. Fabricate using single wall, 20-gauge, 0.035-inch Type 304 stainless steel with external welded joints.
 3. Seal joints during installation with factory-supplied overlapping V-bands and sealant.
- F. Kitchen Hood and Grease Exhaust Duct:
1. Fabricate in accordance with ductwork manufacturer's instructions, SMACNA (DCS), SMACNA (KVS), and NFPA 96.
 2. Manufacturers:
 - a. Jeremias Exhaust Systems.
 - b. Metal Fab.
 - c. Schebler.
 - d. Substitutions: See Section 23 0500 - HVAC General Provisions.
 3. Round, Double-Wall, Premanufactured Grease Exhaust Ducts:
 - a. UL Listed and labeled to UL 1978.
 - b. Nominal 1 inch thick, body soluble fiber insulation that fills annular space between inner liner of 20-gauge, 0.035 inch Type 304 stainless steel and outer jacket of 24-gauge, 0.023-inch aluminized steel.
 - c. Seal joints during installation with factory-supplied overlapping V-bands and sealant.
 - d. Minimum horizontal slope of 1/16 inch per foot per manufacturer's listing to UL 1978.
 4. Zero Clearance, 2-Hour Fire-Rated, Round, Double-Wall, Premanufactured Grease Duct:
 - a. UL Listed and labeled to UL 1978 and UL 2221.
 - b. Nominal 3 inches thick, high density body soluble fiber insulation between 20-gauge, 0.035-inch Type 304 stainless steel liner, and 24-gauge, 0.0239-inch aluminized steel sheet outer jacket.
 - c. Seal joints during installation with factory-supplied overlapping V-bands and sealant.
 - d. Through-penetration firestop listed to UL 1479 or ASTM E814.
 - e. Minimum horizontal slope of 1/16 inch per foot per manufacturers listing to UL 1978.

5. Zero Clearance, 2-Hour Fire-Rated, Rectangular, Double-Wall, Premanufactured Grease Duct:
 - a. Listed when tested in accordance with UL 1978 and ASTM E2336.
 - b. Construct of 16-gauge, 0.059-inch sheet steel using continuous external welded joints in rectangular sections.
 - c. Construct of 18-gauge, 0.050-inch stainless steel using continuous external welded joints in rectangular sections.
 - d. Liquidtight with continuous external weld for seams and joints.
 - e. Where ducts are not self-draining back to equipment, provide low-point drain pocket with copper drain pipe to sanitary sewer.
 - f. Through-penetration firestop listed to UL 1479 or ASTM E814.
6. Grease Exhaust Duct Access Doors:
 - a. Listed when tested in accordance with UL 1978.
 - b. Install hinged access doors where indicated or required for access for cleaning and inspection of duct.
 - c. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles.
 - d. Size: 12 by 12 inches.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. Install products following the manufacturer's instructions.
- C. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- D. Flexible Ducts: Connect to metal ducts with liquid adhesive plus tape.
- E. Kitchen Hood Exhaust: Provide residue traps at the base of vertical risers with provisions for the cleanout.
- F. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.
- G. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

- H. Connect terminal units to supply ducts directly or with one foot maximum length of flexible duct. Do not use flexible duct to change direction.
- I. Fire Partitions: Provide firestopping sealing. See Section 07 8400.
- J. Duct Insulation: Provide duct insulation. See Section 23 0713.
- K. Ductwork shall be run as high as possible in all rooms to maintain proper headroom. Where two or more ducts cross each other, they must be arranged in such a manner as to maintain the greatest possible clearance underneath.
- L. Ductwork shall not cover any electrical outlets or junction boxes. Consult with other trades to avoid interference with piping runs, etc.
- M. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- N. Ducts shall conform to dimensions on the Drawings unless location of structural members prohibit. Make minor changes in run of certain ducts without extra cost to the Owner if necessary to avoid unforeseen structural or other interferences.
- O. All ducts shall be straight and smooth on the inside with finished joints. No inside standing seams will be permitted in ductwork. No single thickness partitions shall be allowed between ducts. The Engineer reserves the right to order any open seams or joints made tight by caulking or taping. No open joints at corners or elsewhere will be allowed.
- P. Where space permits, elbows shall have a centerline radius equal to 1½ times their width. Shorter radius and square throat elbows shall be used where required to fit restricted areas only and where required by the duct connection details on the Drawings. All short radius and square throat elbows shall be provided with turning vanes.
- Q. Watertight drip pans shall be provided below all power vent, relief vent, gravity vent, fresh air and exhaust openings through roof, either built into the ductwork or, if no duct is installed, independently suspended below opening. All fresh air, exhaust air and relief air louver plenums shall have watertight seams on bottom portion of plenums. All fresh air ductwork and other ductwork, as noted on the Plans, shall be caulked watertight.

3.2 LISTED GREASE DUCT

- A. Locate to comply with minimum clearances from combustibles and minimum termination heights according to product listing or NFPA 211, whichever is most stringent.
- B. Seal between sections of grease exhaust ducts according to manufacturer's written installation instructions, using sealants recommended by manufacturer.
- C. Support vents at intervals recommended by manufacturer to support weight of vents and all accessories, without exceeding appliance loading.

- D. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.

3.3 CLEANING

- A. Clean thoroughly each duct system. See Section 23 0130.51.

END OF SECTION

**SECTION 23 3300
AIR DUCT ACCESSORIES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Air turning devices/extractors.
- B. Duct access doors.
- C. Duct test holes.
- D. Flexible duct connectors.

1.2 RELATED REQUIREMENTS

- A. Section 23 3100 - HVAC Ducts and Casings.

1.3 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- B. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2024.
- C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- D. UL 1978 - Grease Ducts; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide for shop-fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers.
- D. Project Record Drawings: Record actual locations of access doors and test holes.

1.5 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS**2.1 AIR TURNING DEVICES/EXTRACTORS****A. Manufacturers:**

1. Krueger-HVAC, Division of Air System Components: www.krueger-hvac.com/#sle.
2. Ruskin Company: www.ruskin.com/#sle.
3. Titus HVAC, a brand of Johnson Controls: www.titus-hvac.com/#sle.
4. Tuttle & Bailey.
5. Nailor Industries, Inc: www.nailor.com/#sle.
6. Substitutions: See Section 23 0500 - HVAC General Provisions.

- B.** Multi-blade device with radius blades attached to pivoting frame and bracket, steel construction, with push-pull operator strap.

2.2 MANUAL VOLUME DAMPERS**A. Manufacturers:**

1. Louvers & Dampers, Inc, a brand of Mestek, Inc: www.louvers-dampers.com/#sle.
2. Nailor Industries, Inc: www.nailor.com/#sle.
3. Ruskin Company: www.ruskin.com/#sle.
4. Greenheck Fan Corporation.
5. Pottorff: www.pottorff.com/#sle.
6. Vent Products Company, Inc.
7. Substitutions: See Section 23 0500 - HVAC General Provisions.

B. Standard, Galvanized Steel, Manual Volume Dampers:

1. Suitable for horizontal or vertical applications.
2. Single blade, or multiple, opposed-blade design.

- C.** Adjustable quadrants or regulators: Plainly marked to indicate position of damper, with locking nut.

2.3 DUCT ACCESS DOORS**A. Manufacturers:**

1. Ductmate Industries, Inc, a DMI Company: www.ductmate.com/#sle.
 2. Nailor Industries, Inc: www.nailor.com/#sle.
 3. Ruskin Company: www.ruskin.com/#sle.
 4. Greenheck Fan Corporation.
 5. MIFAB.
 6. Substitutions: See Section 23 0500 - HVAC General Provisions.
- B. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick-fastening locking devices. For insulated ducts, install minimum 1-inch thick insulation with sheet metal cover.
1. Less Than 12 inches Square: Secure with sash locks.
 2. Up to 18 inches Square: Provide two hinges and two sash locks.
 3. Up to 24 by 48 inches: Three hinges and two compression latches with outside and inside handles.
 4. Larger Sizes: Provide an additional hinge.
 5. High Temperature Duct Access Doors:
 - a. Comply with NFPA 96.
 - b. Comply with UL 1978.
- C. Access doors with sheet metal screw fasteners are not acceptable.

2.4 DUCT TEST HOLES

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2.5 FLEXIBLE DUCT CONNECTORS

- A. Manufacturers:
1. Carlisle HVAC Products; Dynair Connector Plus G90 Steel Offset Seam Neoprene Fabric: www.carlislehvac.com/#sle.
 2. Ductmate Industries, Inc, a DMI Company: www.ductmate.com/#sle.
 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
 4. Substitutions: See Section 23 0500 - HVAC General Provisions.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.

- C. Flexible Duct Connections: Fabric crimped into metal edging strip.
 - 1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz/sq yd.
 - a. Net Fabric Width: Approximately 6 inches wide.
 - 2. Metal: 3 inches wide, 24 gauge, 0.0239 inch thick galvanized steel.
- D. Maximum Installed Length: 14 inch.

PART 3 EXECUTION

3.1 PREPARATION

- A. Verify that electric power is available and of the correct characteristics.

3.2 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 23 3100 for duct construction and pressure class.
- B. Provide duct access doors for inspection, adjusting, and cleaning at the following locations and elsewhere as indicated:
 - 1. Downstream from control dampers and backdraft dampers.
 - 2. Provide for cleaning kitchen exhaust ducts in accordance with NFPA 96.
 - 3. Provide minimum 12" by 12" size access door for hand and shoulder access, or as indicated on drawings.
 - 4. Label access doors to indicate purpose of access.
- C. Provide duct test holes where indicated and required for testing and balancing purposes.
- D. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.
- E. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.
- F. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum two duct widths from duct take-off.
- G. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

3.3 FIELD QUALITY CONTROL

- A. Operate dampers to verify full range of movement.
- B. Inspect locations of access doors and verify that purpose of access door can be performed.

END OF SECTION

**SECTION 23 3423
HVAC POWER VENTILATORS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof exhausters.
- B. Cabinet exhaust fans.
- C. Kitchen hood upblast roof exhausters.

1.2 RELATED REQUIREMENTS

- A. Section 23 3300 - Air Duct Accessories: Backdraft dampers.

1.3 REFERENCE STANDARDS

- A. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
- B. AMCA 99 - Standards Handbook; 2016.
- C. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2020.
- D. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2016, with Errata (2018).
- E. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; 2014.
- F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2022.
- G. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- H. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2024.
- I. UL 762 - Outline of Investigation for Power Roof Ventilators for Restaurant Exhaust Appliances; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate fan roof curbs and service utilities installation according to fan size.

1.5 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- C. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Carnes, a division of Carnes Company Inc: www.carnes.com/#sle.
- B. Greenheck Fan Corporation: www.greenheck.com/#sle.
- C. Loren Cook Company: www.lorencook.com/#sle.
- D. PennBarry, Division of Air System Components: www.pennbarry.com/#sle.
- E. Twin City Fan & Blower: www.tcf.com/#sle.
- F. Greenheck Fan Corporation: www.greenheck.com/#sle.
- G. Captive-Aire.
- H. Substitutions: See Section 23 0500 - HVAC General Provisions.

2.2 POWER VENTILATORS - GENERAL

- A. Static and Dynamically Balanced: Comply with AMCA 204.
- B. Performance Ratings: Comply with AMCA 210, bearing certified rating seal.
- C. Sound Ratings: Comply with AMCA 301, tested to AMCA 300, bearing certified sound ratings seal.
- D. Fabrication: Comply with AMCA 99.
- E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- F. Kitchen Hood Exhaust Fans: Comply with requirements of NFPA 96 and UL 762.

2.3 ROOF EXHAUSTERS

- A. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch mesh, 0.62 inch thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
- B. Roof Curb: 16 inch high self-flashing of galvanized steel with continuously welded seams, built-in cant strips.

- C. Disconnect Switch: Factory wired, nonfusible, in housing for thermal overload protected motor and wall mounted multiple speed switch.
- D. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked, and line voltage motor drive, power open, spring return.
- E. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm gets attained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.4 CABINET EXHAUST FANS

A. Manufacturers:

- 1. Broan-NuTone, LLC; 744 Recessed Ventilation Fan with Light: www.broan-nutone.com/#sle.
- 2. Carnes, a division of Carnes Company Inc: www.carnes.com/#sle.
- 3. Greenheck Fan Corporation: www.greenheck.com/#sle.
- 4. PennBarry, Division of Air System Components; _____: www.pennbarry.com/#sle.
- 5. Twin City Fan & Blower; T: www.tcf.com/#sle.
- 6. Substitutions: See Section 23 0500 - HVAC General Provisions.

- B. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with acoustic insulation, resiliently mounted motor, gravity backdraft damper in discharge.
- C. Disconnect Switch: Cord and plug-in housing for thermal overload protected motor and wall mounted switch.
- D. Grille: Molded white plastic.
- E. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is reached with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.5 KITCHEN HOOD UPBLAST ROOF EXHAUSTERS

A. Belt or Direct Drive Fan:

- 1. Fan Wheel:
 - a. Type: Non-overloading, backward inclined centrifugal.
 - b. Material: Aluminum, statically and dynamically balanced.
- 2. Housing:

- a. Construct of heavy gauge aluminum including curb cap, windband, and motor compartment.
- b. Rigid internal support structure.
- c. One-piece fabricated or fully welded curb-cap base to windband for leak proof construction.
- d. Construct drive frame assembly of heavy gauge steel, mounted on vibration isolators.
- e. Provide breather tube for fresh air motor cooling and wiring.

B. Shafts and Bearings:

1. Fan Shaft:

- a. Ground and polished steel with anti-corrosive coating.
- b. First critical speed at least 25 percent over maximum cataloged operating speed.

2. Bearings:

- a. Permanently sealed or pillow block type.
- b. Minimum L10 life in excess of 100,000 hours (equivalent to L50 average life of 500,000 hours), at maximum cataloged operating speed.
- c. 100 percent factory tested.

C. Drive Assembly:

- 1. Belts, pulleys, and keys oversized for a minimum of 150 percent of driven horsepower.
- 2. Belts: Static free and oil resistant.
- 3. Fully machined cast iron type, keyed and securely attached to the wheel and motor shafts.
- 4. Motor pulley adjustable for final system balancing.
- 5. Readily accessible for maintenance.

D. Disconnect Switches:

- 1. Factory mounted and wired.
- 2. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Outdoor Locations: Type 3R.

3. Finish for Painted Steel Enclosures: Provide manufacturer's standard or factory-applied gray unless otherwise indicated.
4. Positive electrical shutoff.
5. Wired from fan motor to junction box installed within motor compartment.
- E. Roof Curb: 16 inch high self-flashing of galvanized steel with continuously welded seams, built-in cant strips, insulation and curb bottom, curb bottom, ventilated double wall, and factory installed nailer strip.
- F. Drain Trough: Allows for single-point drainage of water, grease, and other residues.
- G. Options/Accessories:
 1. Birdscreen:
 - a. Provide galvanized steel construction.
 - b. Protects fan discharge.
 2. Drain Connection:
 - a. Aluminum construction.
 - b. Container allows single-point drainage of grease, water, or other residues.
 3. Finishes: Standard factory finish.
 4. Grease Trap:
 - a. Built-in drain connection.
 - b. Container system to collect grease residue.
 5. Hinge Kit:
 - a. Hinges and restraint cables mounted to base sleeve.
 - b. Allows fan to tilt away for access to wheel and ductwork for inspection and cleaning.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with cadmium plated steel lag screws to roof curb.
- C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.

D. Hung Cabinet Fans:

1. Install flexible connections between fan and ductwork; see Section 23 3300. Ensure metal bands of connectors are parallel with minimum 1 inch flex between ductwork and fan while running.

E. Provide sheaves required for final air balance.

F. Install backdraft dampers on inlet to roof and wall exhausters.

G. Provide backdraft dampers on outlet from cabinet and ceiling exhausters fans and as indicated.

END OF SECTION

**SECTION 23 3700
AIR OUTLETS AND INLETS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Diffusers:
- B. Rectangular ceiling diffusers.
- C. Registers/grilles:
 - 1. Ceiling-mounted, egg crate exhaust and return register/grilles.
 - 2. Ceiling-mounted, exhaust and return register/grilles.
 - 3. Ceiling-mounted, supply register/grilles.
 - 4. Wall-mounted, exhaust and return register/grilles.
- D. Duct-mounted supply and return registers/louvers.

1.2 REFERENCE STANDARDS

- A. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Carnes, a division of Carnes Company Inc: www.carnes.com/#sle.
- B. Krueger-HVAC: www.krueger-hvac.com/#sle.
- C. Price Industries: www.price-hvac.com/#sle.
- D. Titus, a brand of Air Distribution Technologies: www.titus-hvac.com/#sle.
- E. Tuttle and Bailey: www.tuttleandbailey.com/#sle.
- F. Nailor Industries Inc: www.nailor.com/#sle.
- G. Hart & Cooley, Inc.

- H. Shoemaker.
- I. Substitutions: See Section 23 0500 - HVAC General Provisions.

2.2 RECTANGULAR CEILING DIFFUSERS

- A. Type: Provide square formed adjustable, backpan stamped, and core removable ceiling diffusers constructed to maintain 360 degree discharge air pattern with sectorizing baffles where indicated.
- B. Connections: Round.
- C. Frame: Provide surface mount and inverted T-bar type as scheduled. In plaster ceilings, provide plaster frame and ceiling frame.
- D. Fabrication: Steel with baked enamel finish.
- E. Color: As indicated on drawings.
- F. Accessories: As indicated on drawings.

2.3 DUCT-MOUNTED SUPPLY AND RETURN REGISTERS/LOUVERS

- A. Type: Duct-mounted, rectangular register for round-spiral duct with adjustable pivot-ended blades, end caps, built-in volume damper, and dual cover flanges to lay flush on duct surface regardless of diameter. Performance to match manufacturer's catalog data.
- B. Material: 22 gauge, 0.0299 inch.
- C. Color: As indicated on drawings.

2.4 CEILING SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, one-way deflection.
- B. Frame: As indicated on drawings.
- C. Construction: Made of steel or aluminum extrusions with factory enamel finish.
- D. Color: As indicated on drawings.
- E. Accessories: As indicated on drawings.
 - 1. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.5 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical face.

- B. Frame: As indicated on drawings.
- C. Fabrication: Steel with 20 gauge, 0.0359 inch minimum frames and 22 gauge, 0.0299 inch minimum blades, steel and aluminum with 20 gauge, 0.0359 inch minimum frame, or aluminum extrusions, with factory baked enamel finish.
- D. Color: As indicated on the drawings.
- E. Accessories: As indicated on drawings.
 - 1. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.
 - 2. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.

2.6 CEILING EGG CRATE EXHAUST AND RETURN GRILLE

- A. Type: Egg crate style face consisting of 1/2 by 1/2 by 1/2 inch grid core.
- B. Fabrication: Grid core consists of aluminum with mill aluminum finish.
- C. Color: As indicated on the drawings.
- D. Accessories: Provide integral gang and face operated opposed blade damper, as indicated on drawings.

2.7 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Fabrication: Steel frames and blades, with factory baked enamel finish.
- D. Color: As indicated on the drawings.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.
- F. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Comply with SMACNA (ASMM) for flashing/counter-flashing of roof penetrations and supports for roof curbs and roof mounted equipment.

- C. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

3.2 CLOSEOUT ACTIVITIES

- A. Demonstrate operational system to Owner's representative.
- B. Instruct Owner's representative to maintain system and use occupant controls or interfaces, as required.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Replace, repair, or touch-up damaged products before Substantial Completion.

END OF SECTION

**SECTION 23 7416
PACKAGED ROOFTOP AIR-CONDITIONING UNITS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Packaged, small-capacity, rooftop air-conditioning units.

1.2 RELATED REQUIREMENTS

- A. Section 23 0548 - Vibration and Seismic Controls for HVAC.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.
- E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- F. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from physical damage by storing off site until roof mounting curbs are in place and ready for immediate installation of units.

1.5 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Carrier Corporation: www.commercial.carrier.com/#sle.
- B. Johnson Controls International, PLC: www.johnsoncontrols.com/#sle.

- C. Rheem Manufacturing Company Inc: www.rheem.com/#sle.
- D. Trane Technologies, PLC: www.trane.com/#sle.
- E. AAON.
- F. Substitutions: See Section 23 0500 - HVAC General Provisions.
 - 1. Prior Approval Requirements: Any manufacturer submitting a Prior Approval request must provide the following at minimum: selection drawings that indicate physical size, component characteristics (CFM/HP/weight/electrical characteristics), and letter indicating current ship date from time of bid for all components.

2.2 FAULT CURRENT PROTECTION

- A. Mechanical equipment with electrical requirements of 20 amps or greater shall be marked from the manufacturer with the short-circuit current rating (SCCR) on the equipment nameplate. Minimum SCCR value shall be as listed below unless scheduled otherwise on Drawing schedules.
- B. Ratings for 208/3/60 systems:
 - 1. 20-amp current protection or less: 5,000 SCCR.
 - 2. 40-amp current protection or less: 10,000 SCCR.
 - 3. 150-amp current protection or less: 35,000 SCCR.
 - 4. Above 150-amp current protection: 65,000 SCCR.

2.3 PACKAGED, SMALL-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS

- A. General: Roof mounted units having gas burner and electric refrigeration that are 6 tons and smaller in capacity.
- B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, heat recovery coil, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

2.4 CASING

- A. Cabinet: Steel with baked enamel finish, including access panels with screwdriver-operated flush, cam type fasteners. Structural members to be minimum 18 gauge, 0.0478 inch, with access doors or panels of minimum 20 gauge, 0.0359 inch.
- B. Insulation: One-inch thick, neoprene-coated glass fiber with edges protected from erosion.

2.5 FANS

- A. Supply Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch pulley, and rubber isolated hinge mounted. Provide with high

efficiency motor or direct drive as indicated. Isolate complete fan assembly. See Section 23 0548.

2.6 BURNERS

- A. Gas Burner: Atmospheric type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame-sensing device, and automatic 100 percent shutoff pilot.
- B. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after airflow proven and slight delay, allow gas valve to open.
- C. High Limit Control: Temperature sensor with fixed stop at maximum permissible setting, de-energize burner on excessive bonnet temperature, and energize burner when temperature drops to lower safe value.

2.7 EVAPORATOR COIL

- A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.
- B. Provide capillary tubes or thermostatic expansion valves for units of 6 tons capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons cooling capacity and larger.

2.8 CONDENSER COIL

- A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.
- B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

2.9 COMPRESSORS

- A. Provide hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and filter drier.

2.10 MIXED AIR CASING

- A. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Outside air damper to fall to closed position. Relief dampers may be gravity balanced.
- B. Gaskets: Provide tight fitting dampers with edge gaskets.
- C. Damper Operator: 24 volts with gear train sealed in oil.
- D. Mixed Air Controls: Maintain selected supply air temperature and return dampers to minimum position on call for heating and above 75 degrees F ambient, or when ambient air temperature exceeds return air temperature.

2.11 AIR FILTERS:

- A. 2-inch thick, glass fiber disposable media in metal frames.

2.12 OPERATING CONTROLS

- A. Provide low voltage, adjustable room thermostat to control burner operation, compressor and condenser fan, and supply fan to maintain temperature setting.
 - 1. Include system selector switch heat-off-cool and auto-on fan control switch.
- B. Provide remote-mounted auto-on fan control switch.
- C. Provide remote readout panels containing signal lights indicating system status, heating system failure, cooling system failure, and dirty filters; check switches proving signal light operations; system on-off switch, and cooling system on-off switch.

2.13 OPERATING CONTROLS - SINGLE ZONE UNITS

- A. Electric solid state microcomputer-based room thermostat, located as indicated in service area with remote sensor located as indicated in service area with remote sensor.

2.14 ROOF CURBS

- A. Roof Mounting Curb: 24 inches high, galvanized steel, channel frame with gaskets, nailer strips.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Verify that roof is ready to receive work and opening dimensions are as required by manufacturer.
- B. Verify that proper power supply is available.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Mount units on factory built roof mounting curb providing watertight enclosure to protect ductwork and utility services. Install roof mounting curb level.
- C. Mount units on roof mounting curb providing watertight enclosure to protect ductwork and utility services. Install roof mounting curb level.
- D. Connect ducts to RTUs with flexible duct connectors.
- E. Install condensate drain, minimum connection size, with trap and indirect connection to nearest roof drain or area drain.
- F. Locate remote panels where indicated on drawings.

3.3 SYSTEM STARTUP

- A. Prepare and start equipment. Adjust for proper operation.
- B. Provide manufacturer's field representative to perform systems startup.
- C. Install new filters at completion of equipment installation and before testing, adjusting, and balancing.

3.4 CLOSEOUT ACTIVITIES

- A. Demonstrate proper operation of equipment to Owner's designated representative.

END OF SECTION

**SECTION 23 7433
DEDICATED OUTDOOR AIR UNITS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Make-up Air Units.

1.2 RELATED REQUIREMENTS

- A. Section 25 1500 - Integrated Automation Software: BAS, BMS, or SCADA.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data with dimensions, duct and service connections, accessories, controls, electrical nameplate data, and wiring diagrams.
- C. Shop Drawings: Indicate dimensions, duct and service connections, accessories, controls, electrical nameplate data, and wiring diagrams.
- D. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions.
- E. Operation And Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- F. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.4 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.
 - 1. Warranty Period: Not less than one year from the date of Substantial Completion.
- C. Provide five year manufacturers warranty for compressor/condenser unit.

PART 2 PRODUCTS

2.1 MAKE-UP AIR UNITS

- A. Description: Factory-assembled, prewired, self-contained unit consisting of cabinet, supply fan, controls, and direct-fired furnace to be installed outside the building.
 - 1. Kitchen make-up air unit and kitchen range exhaust hood shall be by same manufacturer.

B. Manufacturers:

1. ARES; Mars Air Products.
2. Captive-Air Systems, Inc.
3. Grease Master.
4. Greenheck.
5. Modine Mfg. Co.; Commercial HVAC&R Division.
6. Reznor-Thomas & Betts Corporation; Mechanical Products Division.
7. Weather-Rite, Inc.
8. Substitutions: See Section 23 0500 - HVAC General Provisions.

C. Cabinet: Single-wall galvanized-steel panels, formed to ensure rigidity and supported by galvanized-steel channels or structural channel supports with lifting lugs.

1. Cabinet shall be fully weatherized for outside installation.
2. Access Panels: For furnace and fan motor assemblies on both sides of unit.
3. Internal Insulation: Minimum 1 inch thick fibrous-glass duct lining, comply with ASTM C 1071, Type II, applied on complete unit.
4. Finish: Heat-resistant, baked enamel.
5. Non-Ducted Discharge: Galvanized-steel assembly with diffusers incorporating individually adjustable vanes.

D. Supply-Air Fan: Centrifugal, rated according to AMCA 210; statically and dynamically balanced, galvanized steel; mounted on solid-steel shaft with heavy-duty, self-aligning, permanently lubricated ball bearings or pillow-block bearings rated for L-50 or 200,000 hours with external grease fittings.

1. Motor: Open dripproof or totally enclosed, single-speed motor.
2. Drive: V-belt drive with matching fan pulley and adjustable motor sheaves and belt assembly.
3. Mounting: Fan wheel, motor, and drives shall be mounted in fan casing with elastomeric or spring isolators.

E. Outdoor-air Intake: Galvanized steel with 45-degree angle bird screen, and finish to match cabinet; and sized to supply maximum 100 percent outdoor air.

F. Filters: Washable.

G. Dampers:

1. Outdoor-Air and Return-Air Damper: Galvanized-steel, opposed-blade dampers with vinyl blade seals and stainless-steel jamb seals, having a maximum leakage of 10 cfm/sq. ft. of damper area, at differential pressure of 2-inch wg.
 2. Damper Operators: Direct coupled, electronic with spring return or fully modulating as required by the control sequence.
- H. Direct-Fired Furnace: Description: Factory assembled, piped, and wired; and complying with ANSI Z83.4, "Direct Gas-Fired Make-Up Air Heaters"; ANSI Z83.18, "Direct Gas-Fired Industrial Air Heaters"; and NFPA 54, "National Fuel Gas Code."
1. Burners: Cast-iron burner with stainless-steel mixing plates; gas control valve as scheduled; Electrically ignited by hot-surface ceramic or direct spark igniter.
 2. Safety Controls:
 - a. Gas Manifold: Safety switches and controls to comply with ANSI standards.
 - b. Purge-Period Timer: Automatically delays burner ignition and bypasses low-limit control.
 - c. Airflow Proving Switch: Dual pressure switch senses correct airflow before energizing pilot and requires airflow to be maintained within minimum and maximum pressure settings across burner.
 - d. Manual-Reset, High-Limit Control Device: Stops burner and closes main gas valve if high-limit temperature is exceeded.
 - e. Gas Train: Regulated, redundant, 24 VAC gas valve assembly containing pilot solenoid valve, modulating temperature control valve, pilot filter, pressure regulator, pilot shutoff, and manual shutoff all in one body.
 - f. Safety Lockout Switch: Locks out ignition sequence if burner fails to light after three tries. Controls are reset manually by turning the unit off and on.
 - g. Control Transformer: Integrally mounted 24 VAC. Minimum 50 VA, or as coordinated with the Division 230900 contractor for their requirements to be met + 10% capacity.
- I. Kitchen System Controls: Factory-wired, fuse-protected control transformer, connection for power supply and field-wired unit to remote control panel.
1. Supplier shall be responsible to ensure all components are provided for seamless control of Kitchen MAU by remote kitchen control panel.
 2. Control transformer shall be minimum 50 VA, or as coordinated with the Division 230900 contractor for their requirements to be met + 10% capacity.

PART 3 EXECUTION**3.1 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Connect drain pan outlet to nearest building drain system piping.
- C. Adjusting: Use plenum static pressure readings against manufacturer calibration chart to adjust primary airflow as other measuring methods will not work.
- D. Coordinate BAS, BMS, or Integrated Automation linking between unit controller(s) and remote front-end interface; see Section 25 1500.

3.2 MAU INSTALLATION

- A. Install gas-fired units according to NFPA 54, "National Fuel Gas Code."
- B. Install and secure MAU's on roof curbs, and coordinate roof penetrations and flashing with roof construction.
- C. Install suspended units from spring hangers with minimum 1-inch static deflection.
- D. Install floor-mounted units on concrete house-keeping pads and spring isolators with minimum 1-inch static deflection.
- E. Install controls and equipment shipped by manufacturer for field installation with MAUs.
- F. Piping Connections: Drawings indicate general arrangement of piping, fittings, and specialties. Install piping adjacent to machine to allow service and maintenance.
- G. Connect duct to MAUs with flexible duct connectors.
- H. Change filters at completion of work before test and balance.

END OF SECTION

SECTION 23 8126
SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Forced air furnaces.
- B. Air cooled condensing units.
- C. Indoor air handling (fan and coil) units for ducted systems.
- D. Controls.

1.2 REFERENCE STANDARDS

- A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.
- B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.
- C. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2022, with Addendum (2024).
- D. ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.
- E. NEMA MG 00001 - Motors and Generators; 2024.
- F. NFPA 54 - National Fuel Gas Code; 2024.
- G. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- H. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2021.
- I. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; 2024.
- J. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- C. Shop Drawings: Indicate assembly, required clearances, and location and size of field connections.

- D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- E. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Filters: One for each unit.

1.4 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturers warranty for heat exchangers.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Amana Heating & Air Conditioning; Goodman Manufacturing Company, L.P.
- B. Armstrong Air.
- C. Carrier Corporation: www.carrier.com/#sle.
- D. Lennox Industries.
- E. Rheem Manufacturing Company Inc: www.rheem.com/#sle.
- F. Trane Technologies, PLC: www.trane.com/#sle.
- G. York International Corporation / Johnson Controls: www.york.com/#sle.
- H. Substitutions: See Section 23 0500 - HVAC General Provisions.

2.2 SYSTEM DESIGN

- A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
 - 1. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.
- B. Performance Requirements: See Drawings for additional requirements.
- C. Electrical Characteristics:
 - 1. See Equipment Schedule on drawings.

2. ____ volts, single phase, 60 Hz.

2.3 INDOOR AIR HANDLING UNITS FOR DUCTED SYSTEMS

- A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating and cooling element(s), controls, and accessories; wired for single power connection with control transformer.
 1. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
- B. Supply Fan: Centrifugal type rubber mounted with direct drive.
 1. Motor: NEMA MG 1; 1750 rpm multiple speed, permanently lubricated, hinge mounted.
- C. Air Filters: 1 inch thick urethane, washable type arranged for easy replacement.
- D. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
 1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
 2. Manufacturers: System manufacturer.

2.4 OUTDOOR UNITS

- A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
 1. Comply with AHRI 210/240.
 2. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
 3. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23 and UL 207.
- B. Compressor: Hermetic, two speed 1800 and 3600 rpm, AHRI 520 resiliently mounted integral with condenser, with positive lubrication, crankcase heater, high-pressure control, motor overload protection, service valves and drier. Provide time delay control to prevent short cycling and rapid speed changes.
- C. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.
 1. Condenser Fans: Direct-drive propeller type.
 2. Condenser Fan Motor: Enclosed, 1-phase type, permanently lubricated.

- D. Accessories: Filter drier, high-pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
 - 1. Provide thermostatic expansion valves.
 - 2. Provide heat pump reversing valves.
- E. Operating Controls:
 - 1. Provide 7-day programmable room thermostat to maintain room temperature setting.
- F. Mounting:
 - 1. Mounting Pad: Precast concrete parking bumpers, minimum 4 inches square; minimum of two located under cabinet feet.
 - 2. Wall Mounting: Factory bracket assembly manufactured to support outdoor units. Assembly to have corrosion resistant finish.

2.5 GAS FURNACE COMPONENTS

- A. Heat Exchanger: Stainless steel tubular type.
- B. Insulation: Foil-faced.
- C. Burner: Atmospheric type with adjustable combustion air supply,
 - 1. Gas valve, single stage _____ provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
 - 2. Electronic pilot ignition, with silicon nitride igniter.
 - 3. Combustion air damper with synchronous spring return damper motor.
 - 4. Non-corrosive combustion air blower with permanently lubricated motor.
- D. Burner Safety Controls:
 - 1. Thermocouple Sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
 - 2. Flame Rollout Switch: Installed on burner box and prevents operation.
 - 3. Vent Safety Shutoff Sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
 - 4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic resets.
- E. Operating Controls:

1. Cycle burner by room thermostat to maintain room temperature setting.
2. Supply fan energized from bonnet temperature independent of burner controls, with adjustable timed off delay and fixed timed on delay, with manual switch for continuous fan operation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.
- B. Verify that proper power supply is available and in correct location.
- C. Verify that proper fuel supply is available for connection.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.
- B. Install in accordance with NFPA 90A and NFPA 90B.
- C. Install gas fired furnaces in accordance with NFPA 54.
- D. Provide vent connections in accordance with NFPA 211.
- E. Install refrigeration systems in accordance with ASHRAE Std 15.
- F. Install ground-mounted, compressor-condenser components on 4-inch- thick, reinforced concrete base; 4 inches larger on each side than unit. Concrete, reinforcement, and formwork are specified in Division 03.

3.3 CONNECTIONS

- A. Drawings indicate general arrangement of gas piping, fittings, and specialties. Connect gas piping with union or flange and appliance connector valve.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Install condensate drains to indirect waste. Provide neutralizer for condensate from flue.
- D. Vent and Outside-Air Connection, Condensing, Gas-Fired Furnaces: Connect plastic piping vent material to furnace connections and extend outdoors. Terminate vent outdoors with a cap and in an arrangement that will protect against entry of birds, insects, and dirt.
- E. Slope pipe vent back to furnace or to outside terminal.
- F. Connect ducts to furnace with flexible connector. Comply with requirements in Section 233100.

- G. Connect refrigerant tubing to refrigerant coil in furnace and to air-cooled, compressor-condenser unit.
- H. Set controls, burner, and other adjustments for optimum heating performance and efficiency. Adjust heat-distribution features, including shutters, dampers, and relays, to provide optimum heating performance and system efficiency.
- I. Install new filters in each unit within 14 days after Substantial Completion.

END OF SECTION

**SECTION 26 0500
COMMON WORK RESULTS FOR ELECTRICAL****PART 1 – GENERAL****1.1 DESCRIPTION****A. Specification Format**

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
 - a. "Part 1.0 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
 - b. "Part 2.0 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
 - c. "Part 3.0 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions

1. "Furnish" - Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. "Install" - Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. "Or Approved Equal" - Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. "Or Equivalent" - Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. "Provide" - Furnish and install in place, total and operational.
6. "Manufacturer's Representative" – person properly trained/certified for the specific equipment and a regular employee of the Manufacturer, the Manufacturer's Representative Agency, a third party specializing company, or the selling distributor.
7. "Substantial Completion" - The date when the project has been completed, inspected, and accepted by the Engineer and Owner.

C. Work Included

1. Provide labor, equipment and materials in connection with Work specified and shown on Drawings.

2. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.
3. Examine site and all Contract documents prior to submittal of bid.

D. Work Installed But Furnished Under Other Directives

1. Provide service for electrically operated equipment not specified in Division 26, 27 & 28. Verify size and locations of such connections by securing all rough-in requirements from the equipment supplier.
2. Equipment requiring electrical service shall be furnished with motors, special controls and remote electrical devices as specified in other Divisions.
3. Verify extent of controls and devices furnished by referring to Divisions where Work is specified.
4. Provide disconnects, starters, control devices, thermal units, fuses, switches and all necessary power and control wiring. Include the installation of remote electrical devices furnished separately with the equipment. Provide identification for remote devices as directed by the Engineer.
5. Contractors of other Divisions providing electrically operated equipment shall verify with the Electrical Contractor the proper voltage and phase before releasing equipment for shipment.
6. Unless otherwise specified, Contractor responsible for furnishing such equipment is also responsible for setting in place.

1.2 NOT USED

1.3 CONTINGENCY

- A. Use contingency only on issuance of Change Orders.
- B. Refer to Division 1 for the amount to include in the Electrical Bid.
- C. Money remaining in contingency at close of project will be credited to the Owner by Change Order.

1.4 SUBMITTALS

- A. Substitution and Prior Approval to Quote.
 1. The reference to manufacturer's name and catalog or model numbers shall be interpreted as establishing a standard of quality, not as limiting competition.
 2. Suppliers wishing to price material or equipment not referenced in Specifications or on Drawings shall apply in writing to Engineer for approval to quote. Electronic submittals shall be in PDF format. Include complete descriptive technical data on the proposed item consisting of: model numbers, type, size and performance characteristics. Procedure also applies to requests by Contractor. Self-addressed, stamped envelope required for return reply.
 3. The request for prior approval to quote shall be received in Engineer's office no later than 192 hours (eight days) prior to bid opening. All substitute items approved for quotation will be listed in Addenda sent to all planholders in advance of bid opening.

4. Contractors choosing to use material or equipment other than those shown on Drawings or specified in detail, but approved for quotation, shall be responsible for physical dimensions and coordination. Architect, Engineer, or Owner will not be responsible for costs of necessary changes and additional work required by Contractor or any other trades.
5. Substitutions will not be permitted after bid opening.

B. Correspondence

1. Direct all correspondence concerning Division 26, 27, & 28 submittals to:

THOMAS KEELING
PRAIRIE ENGINEERING, P.C.
1905 17TH ST SE
MINOT, ND 58701
tkeeling@prairieengineeringpc.com

C. Shop Drawings

1. Before any of the materials are delivered to the job, submit to Engineer via the Prime Contractor complete Shop Drawings for each item indicated.
2. Include catalog numbers, performance data, dimensions and other descriptive information.
 - a. The actual part numbers and options for equipment to be utilized shall be highlighted to indicate exact equipment to be furnished.
 - b. Only include information relevant to the equipment being provided. Any extraneous materials shall be removed prior to submittal.
3. Shop Drawings shall be in electronic PDF format and shall include catalog sheets showing all necessary information. Shop drawings shall be separated by specification section, and equipment from separate specification sections shall not be combined.
4. Shop Drawings shall be submitted under the appropriate specification section of the electronic submittal service being used. The shop drawing file for each section shall include the specification section number, section name, and revision number. Example: "262726 Wiring Devices REV 01".
 - a. If an electronic submittal service is not being used, shop drawings may be emailed to the Engineer at the email address indicated above. Emailed shop drawings shall not exceed 10 MB. If shop drawings exceed 10 MB, contact the Engineer to arrange for a file transmittal method.
5. Each Shop Drawing folder shall be **stamped, initialed, and dated**, on a cover sheet included in the PDF submittal by Division 26 Contractor to indicate they have thoroughly reviewed them in accordance with General Conditions. **Email message text not acceptable.**
 - a. If the Division 26 contractor is under a Prime Contractor, the Prime Contractor may also include a review stamp. However this does not relieve the Division 26 contractor from applying their review stamp.
6. Shop Drawings not in conformance with Specification will be returned to Prime Contractor without review.
7. A maximum of two reviews will be completed for each section. Additional submittals required due to lack of proper corrections being made may be subjected to review fees from the Engineer billed to the Division 26 contractor.

D. As-Built Drawings

1. Designate one set of clean blueprints at project site as As-Built Drawings. Make As-Built Drawings available to Engineer during project visitation.
2. As work progresses, Contractor's field supervisor shall mark As-Built Drawings in red pencil to indicate actual conditions of installation.
3. Show same general details as Drawings.
4. Give particular attention to marking actual locations of feeders and underground runs.
5. Affix all addendum and change order descriptions to appropriate as-built drawing sheet, utilizing spray adhesive.
6. Submit As-Built Drawings to Engineer along with Record Manuals at close of project in PDF format.
 - a. As-Built Drawings shall be submitted as one PDF file.
 - b. Record Manuals shall be submitted as one PDF file.
7. Provide minimum one hard copy of As-Built Drawings to the Owner.
8. Review Division 1 for additional requirements for hard copies of As-Built Drawings.

E. Record Manuals

1. Upon completion of Work of this Division and as condition of its acceptance, Contractor shall compile Record Manuals.
 - a. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual.
 - b. Provide one electric PDF copy to Engineer for review.
 - 1) After electronic PDF copy is reviewed and approved, provide one hard copy of Record Manual to Owner. Include an index sheet indicating each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
 - 2) Review Division 1 for additional requirements for hard copies of Record Manuals.
 - c. Record Manual information shall be included for all equipment/material where Shop Drawings are required. **Also include all installation, operation and maintenance data packaged with any equipment.**
2. Turn over to Owner all spare equipment and devices specified and shown. List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
3. Include one copy of formal instructional recordings, properly identified as to specification section.
4. Include copy of State Electrical Board Wiring Certificate in each Record Manual.
5. Include service equipment fault current calculation and step-down transformer fault current calculations in record manuals. Utility transformer fault current shall be calculated per Section 260553-3.3. Step-down transformer fault current shall be calculated per Section 262200-1.2. Provide in tabular form, as per the following example:

Transformer	kVA	Sec. Voltage	Phase	Impedance	Fault Current	Date Calculated
Utility	300	480	3	1.06%	34,043 amps	11/15/2016
T-1	150	208	3	3.8%	10,958 amps	11/15/2016

6. Calculate the available fault current (AFC) for the mechanical and electrical equipment listed and provide the information in tabular form, utilizing naming convention on the drawings.
 - a. HVAC Equipment 1HP and larger
 - b. Refrigeration Equipment
 - c. Elevator Equipment
 - d. Industrial Control Panels
 - e. Electrical Distribution Equipment
 - f. Branch Panelboards
 - g. MCC's.

7. Fault Current Table Format Example:

Equipment	Voltage	Phase	AFC at Equip.	Date Calculated
AH-1	480	3	5,289 amps	11/15/2016
CU-1	208	3	2,321 amps	11/15/2016

8. Transformer fault current table and equipment fault current calculation table shall be grouped together in the same tabbed section of the record manuals.

1.5 QUALITY ASSURANCE

A. Qualifications of Installers

1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.
3. To the maximum extent possible, retain the same supervisory personnel throughout the duration of the Work.

B. Licenses, Permits, Codes and Standards

1. Materials, workmanship and installation: comply with the latest editions of all applicable codes, local ordinances, industry standards, utility company regulations, insurance carrier requirements and these Specifications.
2. Codes and standards shall include, but not necessarily be limited to, the following:
 - a. Underwriters Laboratories (UL) or other Nationally Recognized Testing Laboratory (NRTL)
 - b. National Electrical Code (NEC)
 - c. National Fire Protection Association (NFPA)
 - d. Occupational Safety and Health Act (OSHA)
 - e. State and local wiring standards
 - f. Building and fire codes
3. The more stringent provisions shall govern where provisions of pertinent codes and standards conflict with these Specifications or Drawings. Where Codes, Specifications or Drawings differ with one another, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies to the Engineer immediately.
4. Pertinent codes and standards shall not be cited to furnish less than specifically shown or specified.

5. Obtain and pay all permits, inspections, licenses and other charges pertaining to the Work. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.

1.6 GUARANTEE AND WARRANTY

- A. Unless otherwise modified by other sections of this specification, contractor shall guarantee materials, workmanship and the proper operation of equipment for a period of one year. Warranty period shall begin at date of substantial completion, or date of specific equipment commissioning, whichever is later. Contractor shall correct all equipment, material and workmanship found to be defective or non-conforming to the contract documents without cost to Owner.
- B. Guarantee shall include trips to the project site by Contractor to adjust electrical equipment as required, ensuring it is operating as intended.
- C. Specified guarantee shall not relieve Contractor from liability arising from improper installation or non-compliance with applicable codes.
- D. Contractor shall include written warranty statement, indicating start and end dates of warranty period. Warranty statement shall be included with each copy of the Record Manuals.

1.7 CHANGES TO CONTRACT

- A. Any required changes to the contract after bid date shall be in accordance with General Conditions/Division 1 and this section. Where any discrepancies between the sections are encountered, the more restrictive section shall apply.
- B. Proposed changes shall be accompanied with complete substantiating documentation.
 1. Provide an itemized list of quantities for materials, equipment, and supplies.
 - a. Include unit costs for each item and extended price.
 - b. Include unit labor for each item and extended time.
 2. Provide subcontractor proposals that include the same substantiating documentation.
 3. Provide quotations from suppliers for any specially ordered equipment.
- C. Material costs shall be actual costs to the contractor, obtaining the materials through normal supply channels, including trade and quantity discounts. Utilizing "suggested pricing" from national pricing organizations for unit costs shall not be accepted. Upon request, the contractor or subcontractor shall submit evidence to substantiate the costs.
- D. Labor units shall be industry accepted standard labor hours to perform one unit of work. If the work is being performed in a location that is not considered to be standard working conditions for that specific task, additional labor shall be itemized.
- E. Labor rates shall be the actual rate paid for the workman category along with associated labor burden. Labor burden shall consist only of the mandatory fringe benefits, labor taxes, and labor insurances as affected by payroll. The owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the fringe benefit cost is in excess of established labor agreements.

- F. Allowable markups for contractor and subcontractors
 - 1. Overhead on work performed by own forces: 12% maximum
 - 2. Profit on work performed by own forces: 10% maximum
 - 3. Commission on work performed by Subcontractors: 5% maximum
 - 4. Sales tax.
 - 5. Bond and permit increases where applicable.
- G. No additional markups shall be allowed for:
 - 1. Field and/or office supervision/administration time.
 - 2. Tool burden.
 - 3. Shop burden.
 - 4. Overhead/Profit applied to work performed by others.
- H. Additional costs for travel and subsistence shall only be allowed if the proposal includes a request for extension of the completion date. Furthermore, those costs shall be proportional to the number of working days of the extension.
- I. Subcontractors shall compute their costs in the same manner as the contractor. Subcontractors are subject to the same markup constraints as described herein.
- J. For changes resulting in credit to the costs, no restocking fees for materials shall be applied by the contractor or subcontractors.

1.8 TEMPORARY FACILITIES

- A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

1.9 APPLICATIONS FOR PAYMENT

- A. Refer to Division 1 “Applications for Payment”.
- B. Provide one additional copy, sent directly to the Engineer.
- C. Format and content:
 - 1. When included with the Bid, the following categories shall be indicated on the application for payment:
 - a. *Project mobilization.*
 - b. *Demolition.*
 - c. *Service & Distribution* (all switchgear, panels, transformers, motor control centers, and loose control/disconnects, installed in place).
 - d. *Lighting* (all fixtures and lamps, installed in place, including pre-fabricated wiring system).
 - e. *Wiring Devices* (all switches, receptacles, and plates, except voice-data, installed in place).
 - f. *Equipment Connections* (HVAC, elevator, food service, etc, connected in place).
 - g. *Basic Materials* (all conduit, wire, boxes, supports, fittings, grounding materials, except special systems and voice-data cabling systems, installed in place).
 - h. *Fire Alarm & Detection* (all system equipment, installed in place).

- i. *Special Systems* (all system equipment and cabling, installed in place, broken out by Specification Section. Examples include Clock and Program, Intercom, Nurse Call, Public Address, Sound Reinforcement, Rescue Assistance, TV Signal Cabling, Architectural and Theatrical Lighting Controls, and the like).
- j. *Generator* (all system equipment, installed in place).
- k. *Voice-Data Cabling Systems* (all system equipment, installed in place).

PART 2 – PRODUCTS

2.1 MATERIAL

- A. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.
- B. All material and equipment shall be new when delivered to the job and be listed by a Nationally Recognized Testing Laboratory (NRTL).
- C. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.

2.2 PRODUCT HANDLING

- A. Protection
 - 1. Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements
 - 1. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

PART 3 – EXECUTION

3.1 GENERAL

- A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.
- B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.
- C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.

3.2 SURFACE CONDITIONS

- A. Prior to work of each Section of Division 26, 27, & 28, 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.

- B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 COORDINATION

- A. Order material in a timely fashion to assure it is on the job site when required.
- B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.

3.4 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

A. Discrepancies

1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
3. Written interpretation or clarification will be made by Addenda.

B. Construction Conflicts

1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.
2. Do not proceed with installation in area of question until conflict has been fully resolved.
3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.

C. Drawings

1. Drawings indicate extent and general layout of electrical systems for project. Due to small scale, it is not possible to indicate all fittings and accessories that may be required. Provide such fittings and accessories as required to form a complete and operating system in general conformance with Specifications and Drawings.
2. Data indicated on Drawings and in these Specifications is as exact as could be secured, but absolute accuracy is not guaranteed.
3. Exact locations, distances, levels and other conditions will be governed by the structure. Field measurements shall take precedence over the Drawings. Use the Drawings and these Specifications for guidance. Secure the Architect's approval for all changes in locations.
4. Verify all measurements at site. No compensation will be made because of difference between locations shown on the Drawings and measurements at the building.
5. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.5 UNDERGROUND UTILITIES

- A. Locations of existing underground utilities are based on available site information and are shown approximately. Contractor shall determine exact utility locations before commencing work and shall be responsible for repair of damages resulting from his construction activities.

- B. Trench and backfill for installation of underground conduits to depth shown or required. Remove any accumulated water in excavation by pumping. Shore and brace excavation as required by safety regulations. Provide temporary bridges to maintain normal traffic flow. Excavation and backfill required by electrical installations shall be accomplished in accordance with Earthwork Specifications by this Contractor.

3.6 CUTTING AND PATCHING

- A. Carefully lay out all work in advance to minimize cutting, channeling or drilling.
- B. Where necessary, all such cutting and patching shall be done in a manner approved by Architect.
- C. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.
- D. Use only rotary type drilling tools to cut concrete.
- E. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.7 TESTS

- A. Perform all tests as required by Engineer during construction and as described in other Sections of these Specifications.
- B. Testing of entire installation shall be completed before final inspection.

3.8 INSTRUCTIONS

- A. After all required approvals of the Work have been obtained; demonstrate the operation and maintenance of all electrical equipment to the Owner's personnel.
- B. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Instructions to include all building's electrical systems and equipment.
- C. Copies of written operating and maintenance instructions shall be included with each Record Manual.
- D. Electrical Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment. Provide similar equipment supplier's instructions where specified thus. Formal instruction to occur with each Record Manual, being referenced to and a part of the Manual.
- E. Formal instructions shall be recorded when required by other Sections of this Specification by this Contractor. Format shall be digital media capable of being played on Windows or Mac operating systems, or shall be submitted on a USB storage device.
 - 1. Electronic PDF files for the as-built drawings and record manuals shall also be included on the USB storage device with the formal instructions.

3.9 CLEAN UP

- A. Remove all scrap material left on job during and after installation of Work.
- B. All equipment having finished paint surfaces shall be examined upon completion for scratches and other damage. Touch up all surfaces as required with paint of color to match factory finish.
- C. Perform all cleaning as required by other Sections of Division 26, 27, & 28.

END OF SECTION

**SECTION 26 0505
TEMPORARY FACILITIES & CONTROLS****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Temporary electricity.

1.2 PRODUCT HANDLING**A. Protection**

1. Use all means necessary to maintain temporary facilities and controls in proper and safe condition throughout the progress of Work.

B. Replacements

1. In the event of loss or damage, immediately make all repairs and replacements necessary at no additional cost to Owner.

PART 2 – PRODUCTS**2.1 UTILITIES****A. Temporary Facilities**

1. General: all costs, including utility company charges, required for the performance of temporary electrical system, shall be paid by Electrical Contractor.
2. Energy charges: Refer to Division 1 for requirements.
3. Temporary Electricity: Electrical Contractor shall:
 - a. Furnish and install all necessary temporary wiring.
 - b. Provide area distribution boxes located so the individual trades may use their own construction type extension cords.
 - c. Provide GFCI protection on all temporary power per NEC.

END OF SECTION

**SECTION 26 0510
REMODELING WORK****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide work in remodeled area as shown on Drawings and Specifications.

B. Existing Conditions

1. Visit existing buildings before submitting bid and become familiar with all pertinent existing conditions. Make allowance in bid for all pertinent existing conditions. No Change Orders will be issued:
 - a. For Contractor's failure to visit site and acquaint himself with existing conditions.
 - b. For any portion of remodeled work necessary for complete installation of systems shown.
 - c. Due to Contractor's lack of understanding of amount of work or difficulty of work involved.

PART 2 – PRODUCTS**2.1 See following sections of this Specification.****PART 3 – EXECUTION****3.1 GENERAL**

- A. Wiring in existing building shall remain except as noted on Drawings or specified.
- B. Verify existing conditions relative to work involved and make allowances thereto.
- C. Balance additional loads to existing circuitry between phases.
- D. Furnish a revised, typed panel directory on existing panelboards where circuitry is changed.

3.2 CUTTING AND PATCHING

- A. Carefully lay out all work in advance to minimize cutting, channeling or drilling.
- B. Where necessary, all such cutting and patching shall be done in a manner approved by Architect.
- C. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all costs.
- D. Use only rotary type drilling tools to cut concrete.

- E. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.3 REMOVAL AND/OR REUSE OF EXISTING MATERIALS AND EQUIPMENT

- A. Remove or relocate existing conduits, wires, equipment, devices or fixtures indicated on Drawings or as required.
- B. Remove any existing non-active voice/data cables including trunk cables, and any other special systems cables in the entirety. Verify with Owner prior to removal.
- C. Remove any existing exposed abandoned raceways, including those above accessible ceiling finishes in their entirety. Verify with Owner prior to removal. Where complete conduit removal is not feasible, cut conduit flush with walls and floors, and patch surfaces.
- D. Provide additional code-mandated supports on any remaining (existing prior to project and located within the remodel area) unsupported raceway systems or communications cabling including fiber optic, voice/data and special systems.
- E. Where existing multi-wire lighting and power branch circuits are modified in any way, it is this Contractor's responsibility to provide additional grounded (neutral) conductors as required between the electrical panelboard and existing circuit devices. Circuit breaker tie-handles are not acceptable. In the event that existing raceways are not properly sized to accommodate the required additional conductors, new raceway shall be installed.
- F. Where the reuse of existing conduits, wires, and devices, or fixtures is permissible, verify that wiring is continuous. Existing outlet or junction boxes shall not be rendered inaccessible by structural changes made to the building.
- G. Verify that no devices are cut off from power source unless specifically noted.
- H. Existing equipment which is indicated as being removed and not indicated for reuse shall remain the property of the Owner, stored as directed. Remove and dispose any material the Owner does not wish to retain, except fluorescent lamps and ballasts.
- I. Do not break, dump or otherwise destroy removed fluorescent and HID lamps, due to possible mercury contamination. Removed lamps are to be recycled and converted by an EPA-Licensed company regularly engaged in this business, and offering this service in accordance with all EPA, State, and Local Regulations:

Green Lights Recycling, Inc.
10040 Davenport Street NE
Blaine, MN 55449
(763) 785-0456

Recycle Technologies
4000 Winnetka Ave. N
Minneapolis, MN 55427
(800) 969-5166

Waste Management Lamp Tracker, Inc.
10050 Naples St NE
Blain, MN 55449
(800) 664-1434

or equivalent as selected by the Contractor.

All associated recycling costs shall be included in this Contract. Recycler shall provide Owner with a Certificate of Conversion, indicating Owner's manifested lamps have been properly recycled and converted. Comply with recycler's packing and shipping instructions.

- J. Do not dump or otherwise destroy removed ballasts, due to possible PCB contamination. Removed ballasts are to be destroyed by an EPA Licensed company regularly engaged in this business, and offering this service in accordance with all EPA, State, and Local Regulations:

Green Lights Recycling, Inc.
10040 Davenport Street NE
Blaine, MN 55449
(763) 785-0456

Recycle Technologies
4000 Winnetka Ave. N
Minneapolis, MN 55427
(800) 969-5166

Waste Management Lamp Tracker, Inc.
10050 Naples St NE
Blain, MN 55449
(800) 664-1434

or equivalent as selected by the Contractor

All associated destruction costs shall be included in this Contract. Recycler shall provide Owner with a Certificate of Destruction, indicating Owner's manifested ballasts have been properly destroyed. Comply with packing and shipping instructions.

- K. Assume existing equipment and fixtures shown to be reused are in good working condition and can be installed without any repairs or, if in unusable condition, notify the Architect for decision. Contractor shall be responsible for any damage by his personnel to equipment in removal or handling.
- L. Provide blank plates as required at existing rough-ins not being re-used.
- M. Clean fixtures and other equipment removed and indicated for reuse. Provide new lamps for reused fixtures.

3.4 CONTINUITY OF SERVICE

- A. Existing building will be in use during construction. Schedule and carry out work for a minimum of inconvenience to the Owner.
- B. All service interruptions shall require a prior approval by Owner. Confine interruptions to the smallest area possible.
- C. Verify that automatically controlled, electrically operated equipment is returned to the same operating condition which existed prior to interruption.

3.5 ASBESTOS

- A. Contractor is assumed to be knowledgeable about Federal, State, and Local requirements with respect to asbestos issues.

- B. Avoid disturbance of any asbestos-containing material (ACM) within the construction area or elsewhere on the site.
- C. Verify with Owner's "Asbestos Survey and Management Plan" the extent (if any) of existing asbestos.

END OF SECTION

**SECTION 26 0519
CONDUCTORS****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide a complete system of conductors enclosed in a raceway.

1.2 SUBMITTALS**A. Record Drawings**

1. Maintain accurate record drawings in accordance with Section 260500.

PART 2 – PRODUCTS**2.1 CONDUCTOR****A. Copper**

1. Soft drawn, annealed.
2. Conductivity of not less than 98% pure copper.
3. Insulated for 600 volt service.
4. #10 AWG and smaller: Solid, THWN/THHN.
5. #8 AWG and larger: Stranded, THWN/THHN.
6. Provide USE where required by Code.

B. MC Cable

1. MC cable is not acceptable for use as a wiring method.

2.2 SPLICES

- A. #10 AWG and smaller: Scotchlock Y, R or G as manufactured by 3M Company, or equivalent.
- B. #8 AWG and larger: Compression type, as manufactured by Anderson, Burndy, Thomas and Betts Company, or equivalent.

2.3 LUBRICANT**A. General**

1. NRTL-listed.
2. Flame resistant
3. Compatible with conductor insulation.

B. Acceptable Manufacturer

1. As selected by Contractor.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Install in accordance with Code, product listing, and manufacturer's recommendations.
2. Install wire and cable in Code-conforming raceways after moisture and debris is swabbed from conduit.
3. Refer to system specified for conductor's peculiar to that system.
4. Conductor sizes: Standard AWG, #12 minimum unless otherwise indicated.
5. Fixture taps: minimum #16 AWG.
6. Conductor temperature ratings: Compatible with the equipment to which it is to be connected. Refer to product listing.
7. Make conductor length for parallel feeders identical.
8. Derate ampacities as required for high ambient temperatures or conductor fill.

B. Color

1. Multi-wire (shared neutral) circuits.
 - a. 120/208 volt
 - 1) Phase conductors: Black, red or blue.
 - 2) Grounded conductor (neutral): White.
 - 3) Grounding conductor: Green or bare.
2. Separate neutral circuits:
 - a. 120/208 volt
 - 1) Phase conductors: Black, red or blue.
 - 2) Grounded conductor (neutral): White with stripe colored to match phase.
 - 3) Grounding conductor: Green or bare
3. Switch legs: Same as phase conductors.
4. 120 volt isolated ground circuits:
 - a. Phase conductor: Orange.
 - b. Grounded conductor (neutral): White with orange stripe.
 - c. Grounding conductor: Green with yellow stripe.

C. Splices

1. Eliminate wherever possible.
2. Made only at outlet or junction boxes.
3. Obtain special permission from Engineer for any splices in feeder conductors.

D. Voltage Drop

1. Increase size of circuit wiring in accordance with NEC 210.19(A)(1), fine print note, No. 4.
2. Use #10 AWG minimum for all home run conductors longer than 75 feet on 120/208/240 systems and 150 feet on 277/480 systems.

3.2 TESTS

- A. After equipment and wiring is installed, and before it is energized, test all power circuits with a megohmmeter for insulation resistance, phase-to-phase and phase-to-ground faults.
- B. Before testing, disconnect all equipment that might be damaged by the test voltages.

END OF SECTION

**SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Bond and ground all electrical equipment in accordance with National Electrical Code, State/Local Codes, these Specifications and as shown on Drawings.

B. Description of System

1. The service equipment, conduit systems, supports, cabinets and neutral conductor shall be solidly grounded and bonded in accordance with National Electrical Code to form a permanent effective and continuous grounded system.

PART 2 – PRODUCTS**2.1 GROUND RODS**

- A. Steel with a metallically bonded outer layer of electrolytically applied copper.
- B. Minimum 1/2" diameter 10 foot length, unless otherwise indicated.
- C. Sectional rods not permitted.
- D. Manufacturer: ERITECH or equivalent.

2.2 GROUND ROD CLAMPS

- A. Ground rod clamps shall be high strength silicone bronze.
- B. Manufacturer: ERITECH or equivalent.
- C. At Contractor's option, exothermic welding (CADWELD) or impact compression (ERITECH Hammerlock) may be used in place of ground rod clamps.

2.3 WATER PIPE GROUND CLAMPS

- A. Steel U-bolt with bronze saddle.
- B. Thomas and Betts Company 3900 series or equivalent.

2.4 REBAR GROUND CLAMPS

- A. Bronze alloy construction.
- B. Sized as required by rebar stub out.

- C. Eritech RC or EK series as required by local authority. Equivalent products by Thomas and Betts acceptable.

PART 3 – EXECUTION

3.1 GENERAL

- A. **Grounding conductors not shown or included on floor plans.**
- B. **When required, increase trade size of raceway accordingly.**
- C. Aluminum not acceptable for use as a grounding conductor.

3.2 SYSTEM GROUNDING

- A. Provide grounding electrode system in accordance with NEC 250.50. If available, each of the items listed in 250.52(A)(1) through (A)(8) shall be bonded together to form grounding electrode system.
- B. Connect grounding electrode conductor to grounded service conductor.
- C. Provide raceway enclosing grounding electrode conductor. If metallic, bond as per NEC 250.64(E). Provide grounding bushing as required complete with jumpers same size as grounding electrode conductor.
- D. To comply with NEC 250.53, provide two ground rods spaced minimum 6'-0" apart.

3.3 EQUIPMENT GROUNDING CONDUCTOR

- A. Non-metallic conduit: Sized in accordance with NEC, except as further modified by this Specification.
- B. Flexible Metal Conduit, Liquidtight Flexible Conduit.
 - 1. Other than for connection of 120 volt recessed luminaires, not acceptable for use as means of grounding.
 - 2. Provide bonding jumper sized in accordance with NEC around all flexible conduits. Use fittings having lugs for termination of jumper.
 - 3. Spiral wrap not acceptable. Lay along surface, secured with cable ties.
 - 4. Bonding jumper maximum length: 6'.
 - 5. Bonding jumper not required where separate equipment grounding conductor is used.
- C. Branch Circuits
 - 1. **Separate equipment grounding conductor required for each raceway.**
 - 2. Size: per NEC 250.122.
 - 3. Bond to grounding bars, junction boxes and luminaire grounding screws.
 - 4. Field install grounding screw in luminaire if not provided by factory.

D. Feeders

1. **Separate grounding conductor required.**
2. Bond to grounding bars in switchboards, panelboards and motor control centers.
3. Provide grounding bushing at both ends of all feeders utilizing metallic raceway.
 - a. Bond to grounding bars at both ends.
 - b. Size bonding jumpers to match equipment grounding conductor.
4. Feeder Equipment Grounding Conductor Size:
 - a. Size per NEC 250.122.
 - b. Copper equivalent ampacity when aluminum phase conductors utilized.
5. Do not splice grounding conductor.

E. Water Pipe System

1. Bond interior metal water piping per NEC Section 250.104(A) if water pipe system is not used as part of grounding electrode system.

END OF SECTION

SECTION 26 0533 RACEWAYS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide all conduit systems as shown on Drawings or required by Codes and Specifications.

B. Description of System.

1. Provide code-conforming raceway system for all conductors unless specifically noted otherwise by phrase "not in conduit".

1.2 SUBMITTALS

A. Record Drawings

1. Maintain accurate record drawings for all raceway runs in accordance with Section 260500.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Metallic conduit and tubing: Allied Tube and Conduit, Republic Conduit, or equivalent.

B. Non-metallic conduit: Carlon Schedule 40 or Schedule 80 where required, Allied Tube and Conduit, Cantex Inc., or equivalent.

C. Flexible metal conduit: Aluminum.

D. Liquidtight, flexible metal conduit: Anaconda Sealtite or equivalent.

E. Fittings

1. Rigid metal conduit: Appleton, Crouse-Hinds, or equivalent. **Pot metal conduit fittings not acceptable.**
2. EMT:
 - a. **Steel.**
 - b. Setscrew or watertight as required.
 - c. Thomas and Betts Company, or equivalent.
 - d. **Pot metal, "Sock-on" and indentor fittings not acceptable.**
3. Flexible metal conduit: STEEL, Thomas and Betts Company XC-400 series, or equivalent.
4. Liquidtight flexible metal conduit:
 - a. **Steel.**
 - b. Straight or angled as required.

c. Appleton, Thomas and Betts Company or equivalent.

F. Hangers and Supports

1. As required by Codes and Specifications.
2. Raco, Unistrut, or equivalent.
3. Erico conduit clips, Type 8-M, 12-M and K-8 acceptable for individual branch circuit runs.

G. Metal Surface Raceway

1. Wiremold 500/700 metallic series or equivalent, unless otherwise indicated on Drawings.
2. Provide associated fittings as required.
3. Standard color as selected by the Architect.

H. Wireway

1. NRTL 870 listing throughout, including connectors and fittings.
2. Hinged cover construction.
3. Sealing capability where required.
4. Suitable for "lay-in" installation of conductors.
5. Rust inhibiting phosphatizing undercoat and baked enamel finish.
6. Plated hardware.
7. Square D "Square Duct" or equivalent.

I. Expansion Fittings

1. Metallic: OZ, Thomas and Betts Company, or equivalent.
2. Non-Metallic: Carlon, or equivalent.

J. Firestop Assemblies

1. Firestop systems shall consist of fittings and/or intumescent materials assembled as per UL (or other NRTL) System Details.
2. Product manufacturers: 3M, Chase Technology Corporation, Dow Corning Fire Stop, Hilti, International Protective Coatings Corp. (Flame Safe), Nelson Fire Stop Systems.

K. Thru Wall and Floor Seals

1. OZ-Gedney Type "FSK" or equivalent.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Electrically continuous throughout.
2. Plumb and level.
3. Cut square and reamed smooth.
4. Use commercial bender for offsets and bends.
5. Cap to prevent debris from entering during construction.

6. Swab conduit prior to installation of conductor.
7. Provide pull cord in empty conduits.
8. Alter conduit routing to avoid structural obstructions, minimizing crossovers.
9. It is the intent of this Specification to provide reasonable provisions for future expansion of electrical use (See NEC 90.8 and 90.1(B), FPN). Therefore, **install all branch circuit home runs as shown on Drawings. Do not combine home runs or increase quantity of conductors therein.**
10. Install raceway, conduit and fittings in accordance with Code, NRTL listing and manufacturer's recommendations.

B. Concealed Interior Raceway

1. Conceal all raceway within building construction.
2. May be run in a direct line for Contractor's convenience.
3. For Contractor's convenience, **concealed** stubs from concrete-encased PVC conduit runs may extend to first **concealed** junction box.
4. Where applicable, center within insulation any electrical conduit routed in attic space. Provide sealing as per NEC 300.7(A) for all conduits exposed to different temperatures.

C. Exposed Interior Raceway

1. Use limited to mechanical and electrical equipment rooms, motor connections, and panelboards scheduled as surface.
 - a. Run parallel or perpendicular to building lines.
 - b. **Provide RGSC or EMT stubs for concrete-encased PVC conduit runs.** Extend stub from RGSC coupling set flush in floor.
 - c. Provide flexible conduit as required for motor and equipment connections.
2. Shall not be used in finished areas unless specific permission is obtained from Engineer.
 - a. Exposed interior raceway in entry, bar, and restaurant area above the ceiling line shall be metallic conduit and tubing.

D. Concrete Encased Raceway

1. Shall not interfere with structural integrity of slab, column, or beam.
2. Installation subject to acceptance of Structural Engineer.
3. Maximum diameter 1/3 thickness of concrete member.
4. Install in center of section.
5. Provide expansion fitting when crossing building expansion joint. Grounding integrity of raceway to be maintained.

E. Exterior Raceway

1. Minimum 24" below grade.
2. PVC unless otherwise indicated.
3. **Exterior surface stubs for PVC conduit runs: RGSC, including final underground sweep.** Exterior surface stubs acceptable only where specifically shown.
4. Penetrating Watertight Walls or Floors: Provide block-out with 1/2" clearance around conduit for underground penetrations. Pack with Oakum and caulk with non-shrinking grout, or provide conduit entrance seal.
5. Penetrating Roof or Waterproofing Membranes: Provide flashing and pitch pocket.
6. Contractor responsible for providing a watertight penetration.

7. Coat RGSC penetrations with heavy asphaltic-base compound.
8. Unless otherwise indicated, route exterior conduits to interior distribution equipment concealed under slab.

F. Supports

1. Refer to NEC 300.11
2. **Tie wire supports not acceptable.**
3. Support Spacing: NEC.

G. Specific Locations

1. Allow 6" minimum clearance at flues, steam pipes and heat sources.
2. Conduit visible behind grills and registers: paint black.
3. Seal conduit where leaving heated area and entering unheated area.
4. Penetrating non-watertight walls or floors: Pack space between conduit and block-out on both sides with Oakum.
5. Penetrating fire rated walls or floors: Seal to prevent passage of fire or products of combustion.
6. From each flush mounted panel location, stub three additional 3/4" conduits into nearest accessible ceiling space.
7. Do not mount raceway on ductwork, cover access doors, panels, controls, or otherwise hinder normal maintenance and repair of the equipment.
8. Motors:
 - a. Connect to motor feeder or branch circuit by means of flexible metal conduit or liquidtight flexible metal conduit in moist areas.
 - b. Minimum flexible length: 18".
 - c. Where practical, feed floor mounted motors from raceway installed in or under slab.
 - d. When floor mounted motors are fed overhead, provide required support for raceway. Extend raceway to floor and provide a floor flange. Insert "T" conduit fitting at proper height and extend flexible conduit to motor.
9. Fire Alarm
 - a. All raceway systems shall be externally identified by permanent RED paint suitable for the purpose to easily distinguish from other electrical raceway systems. Items shall be painted prior to installation. In addition to field painted conduit, factory painted conduit as manufactured by Allied Tube & Conduit or equivalent is acceptable.
10. Exceptions: Raceway color coding shall not apply to the following areas:
 - a. Raceway systems embedded directly in earth or concrete.
 - b. Surface mounted raceways systems in finished spaces where all raceways are to be painted to match adjacent surfaces.
 - c. Surface metal raceway systems such as Wiremold type raceways.

3.2 SIZE

A. National Electrical Code, subject to stated minimums.

B. Minimum Size

1. Exterior raceway: 3/4".

2. In or under poured concrete (including precast concrete panels): 3/4".
3. Branch circuit home run: 3/4". Consider home run to include raceway length from panelboard, switchboard, or motor control center to nearest power consuming or switching device on that circuit.
4. Feeders: 3/4".
5. All others not listed: 1/2".

3.3 TYPE

A. Intermediate Metal Conduit (IMC)

1. May be used in place of rigid galvanized steel conduit for Contractor's convenience.
2. Comply with manufacturer's recommendations for bending, threading and cutting operations.
3. Install as specified for rigid galvanized steel conduit.

B. Rigid Galvanized Steel Conduit (RGSC)

1. Use:
 - a. Overhead electric and telephone service entrance. IMC or Aluminum not acceptable for this application.
 - b. All raceway exposed to weather. Aluminum not acceptable for this application.
 - c. Where required by national, state and local codes.
2. Fittings: Threaded except at KO type boxes where double locknut/bushing method acceptable.
3. Waterproof entire length with heavy asphaltic base compound when:
 - a. Embedded directly in earth.
 - b. Embedded in concrete directly in contact with earth, with or without vapor barrier.
 - c. Penetrations run directly from concrete with earth, to soil burial.
4. Factory applied PVC coating acceptable in place of asphaltic base compound.

C. Rigid Non-Metallic Conduit (PVC)

1. Use only in slabs and exterior underground locations. See 3.1 B3, C4 and E3 for limitations.
2. Provide insulating bushing at all terminal adapters.
3. Provide equipment grounding conductor within raceway.
4. Increase trade size accordingly for equipment grounding conductor.
5. Utilize commercial heating element type bending equipment. **Do not use torches to bend PVC conduit.**

D. Electrical Metallic Tubing (EMT)

1. Use in all areas not prohibited by NEC and this Specification.
2. Do not use in concrete slabs on or under grade, or walls under grade.
3. Do not use in exterior underground applications.

E. Flexible Metal Conduit

1. Use for connections to transformers, motors, fixed appliances, recessed luminaires and other equipment as required.

2. Use liquidtight conduit with liquidtight fittings in areas of high moisture content.

F. Metal Surface Raceway

1. Install complete with matching boxes, fittings, and end caps, parallel or perpendicular to building construction.
2. Wire adjacent devices to alternate circuits where metal surface raceway contains devices integral to the channel.
3. Feed from flush connector in wall directly into raceway. Field cut base as required with 1/2" knockout for this purpose. Do not utilize Wiremold catalog #2051H for 2000/2100 series.

G. Fire Resistive Walls and Decks

1. Preserve integrity of fire rating through the use of UL (or other NRTL) Listed firestop assemblies of appropriate penetration type and rating time.
2. Install in accordance with manufacturer's recommendations.
3. All floor to floor penetrations and all wall penetrations into Mechanical, Electrical, and Communications Rooms shall be sealed with 1 hour firestop assemblies unless more stringent rating is required by building codes.
4. Include UL (or other NRTL) firestop assembly sheets and manufacturer product data sheets specifically used with the Project Closeout Documentation.

END OF SECTION

**SECTION 26 0534
OUTLET, PULL AND JUNCTION BOXES****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide all outlet, pull and junction boxes complete with associated covers and rings.

B. Work Installed But Furnished Under Other Directives.

1. Obtain manufacturer's backboxes or recommendations for special equipment.

1.2 SUBMITTALS**A. Record Drawings**

1. Maintain accurate record drawings in accordance with Section 260500.

PART 2 – PRODUCTS**2.1 CEILING BOXES****A. Flush and Surface**

1. 2-1/8" minimum depth.
2. Square or octagon as required.
3. Galvanized steel.
4. Manufacturer: Appleton, Raco, Steel City or equivalent.

2.2 WALL BOXES**A. Flush**

1. One and two gang wall boxes: 4" square box, 2-1/8" minimum depth with appropriate plaster or tile ring.
2. More than three gang: Gangable 3-1/2" deep unless wall cavity limits depth to 2-1/2".
3. Use 4-11/16" square boxes where required by Code.
4. Single gang masonry boxes acceptable only for single conduit entrance. Feed-through circuiting not acceptable. Use 4" square box/tile ring for feed-through applications.

B. Surface Mounted Devices

1. 4" square box, 2-1/8" minimum depth with appropriate 1/2" raised cover.
2. Manufacturer: Appleton, B-Line, Raco, Steel City, Wiegmann, or equivalent.

C. Sectional, through wall and handy boxes not acceptable.

2.3 PULL AND JUNCTION BOXES

- A. Galvanized steel with cover.
- B. Size: National Electrical Code.
- C. Manufacturer: Appleton, Raco, Hoffman, Shallbetter, Steel City, Wadsworth or equivalent.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

- 1. Install in accordance with code, product listing and manufacturer's recommendations.
- 2. Install boxes plumb, level and flush with finish surface.
- 3. Support securely and rigidly.
- 4. Verify wall depths to ensure adequate clearance for special backboxes.
- 5. Provide barriers in ganged switch outlets where voltage between adjacent switches exceeds 300 volts.

B. Location

- 1. Governed by structural conditions and obstructions.
- 2. Mount switch outlet on strike side of door, maximum 4" from door opening to first switch. Verify door swing with Architectural Plan.
- 3. Coordinate equipment outlets prior to installation for proper concealment.
- 4. Center outlets with respect to acoustical tile, paneling and furring trim.
- 5. Adjust outlets in masonry or tile construction to horizontal and vertical mortar joints.
- 6. Clear all piping, ductwork and other obstructions.
- 7. For outlet boxes on opposite sides of walls or partitions with separation distances of 24" or less, pack all interconnecting conduits with Duxseal after conductor installation, to prevent sound transmission.
- 8. Outlet boxes improperly located shall be corrected at Contractor's expense.

C. Mounting Heights

- 1. All device mounting heights shall conform to ADA Recommendations. Refer to Standard Electrical Symbol Legend for nominal mounting heights.
- 2. Verify height of all outlets to ensure installation above top of radiation covers, mirrors, counters and any other obstructions that may alter nominal mounting height.
- 3. **Measure from finish floor to centerline of outlet.**
- 4. Mount exterior outlets horizontally. Measure height from nearest interior finish floor below outlet.
- 5. Mount outlet designated AC (above counter) no less than 4" higher than top of countertop backsplash.

D. Fire Resistive Walls and Ceilings

- 1. Penetrations for steel electrical outlet boxes permitted, provided:

- a. Boxes do not exceed 16 square inches in area.
- b. Area of such openings shall not exceed 100 square inches for any 100 square feet of area.
- c. Outlet boxes on opposite sides of walls or partitions separated by horizontal distance of 24 inches.

E. Pull and Junction Boxes

1. Pull and junction boxes are generally not indicated on Drawings.
2. Install in accordance with National Electrical Code and as required to facilitate wire pulling.
3. Do not install in finished spaces without approval of Engineer.

F. Identification

1. Identify pull and junction boxes containing system voltages in excess of 250 volts to ground with voltage markers.
2. Voltage markers: Not visible in finished areas.

END OF SECTION

**SECTION 26 0540
FLOOR BOXES****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide floor boxes complete with devices, fittings and carpet flanges.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500.
2. Show all details, including dimensions and service fitting repair parts.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying equipment.

PART 2 – PRODUCTS**2.1 CONCRETE FLOOR SLABS****A. Type A**

1. Box
 - a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
 - b. Construction:
 - 1) Stamped steel, 3.75" overall height with side and bottom knockouts from 3/4" to 1-1/4".
 - a) Provide optional 2" threaded hub adapter as required.
 - c. Provide epoxy coating for specific installations where the box is in direct contact with earth.
 - d. Two independent wiring compartments that allow capacity for up to two duplex receptacles and/or communication services.
 - e. Internal power and communication device brackets as required by specified internal device types and quantities. Provide internal blank plates for all unused compartments.
 - f. Manufacturer: Wiremold #RFBA2C series.
2. Activation Kit (Cover)
 - a. Die cast aluminum, low profile, round cover with flange to sit flush with floor covering.
 - b. Include nonmetallic pre-pour trim ring.
 - c. Provide Tile Shim set to adjust cover to floor height.
 - d. Finish as selected by the Architect.

- 1) Powder coat finish: Black, Bronze, or Gray.
- 2) Metallic finish: Brushed Aluminum, Satin Brass, or Satin Nickel.
- e. Manufacturer: Wiremold #6CT2 series.

2.2 DEVICE QUANTITIES

- A. Type A: Two duplex receptacles.

2.3 WIRING DEVICES

- A. Power: Receptacles as per Section 262726.
- B. Voice/data: Jacks as per Section 271500.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Verify concrete depth prior to ordering floor boxes.
- B. Verify exact location of each floor box with Architect prior to installation.
- C. Install box opening flush with floor in accordance with Code, product listing and manufacturer's recommendations.
- D. Activation Cover Installation
 1. Carpet/VCT floor finishes: Install cover after floor covering installation is completed.
 2. Tile floor finishes: Install cover prior to tile/grout installation. Shim cover as required so top of cover is flush with floor.
- E. Install floor boxes with square covers parallel or perpendicular to building lines.

END OF SECTION

**SECTION 26 0553
IDENTIFICATION****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Label electrical equipment as required by Codes and Specifications and as specifically directed by Engineer.

PART 2 – PRODUCTS**2.1 PANEL DIRECTORIES**

- A. Include directory cards with panelboards.

2.2 NAMEPLATES

- A. Machine engraved black laminate with white core, except as otherwise indicated.
- B. Minimum letter size: 1/8".
- C. Minimum plate size: 1" X 3".

2.3 VOLTAGE MARKERS

- A. Vinyl impregnated cloth markers with legend as required.
- B. Manufacturer: Ideal #44-360, or equivalent.

2.4 PRESSURE SENSITIVE TAPE

- A. Use only when specifically referred to in other Sections.
- B. Manufacturer: Dymo, or equivalent.

2.5 UNGROUNDED CONDUCTOR IDENTIFICATION

- A. As per NEC 210.5(C) and 215.12(C).
- B. Typewritten cards behind plastic shield, affixed with double-stick carpet tape. Heat surface prior to affixing directory.

PART 3 – EXECUTION

3.1 GENERAL

A. Directory Cards

1. **Typewritten only.** Hand lettering unacceptable, except at "spares" and "spaces", where neat hand lettering with erasable pencil is required.
2. Indicate type of load and rooms where load occurs.
3. **Do not use room numbers as shown on Drawings, but refer to name and numbers on door.**
4. Do not identify until final load balancing is accomplished.

B. Nameplates

1. Apply plumb and level with two counter-sunk screws.
2. Glue, double-stick tape, or similar adhesive not acceptable.

C. Device Plates

1. Machine engrave directly on plate in lieu of separate nameplate.
2. Fill inscriptions with contrasting color.

D. Voltage Markers

1. Not visible in finished areas.

E. Junction Boxes

1. Mark all covers with indelible marker to indicate panelboard designation and circuit numbers for circuits contained within box.

3.2 EMERGENCY SYSTEM COMPONENTS

- A. All boxes and enclosures (including transfer switches, generators and power panels) for emergency circuits shall be permanently marked so they will be identified as a component of an emergency circuit for system.

3.3 SERVICE EQUIPMENT FAULT CURRENT NAMEPLATE

- A. Provide warning nameplate on each service disconnecting means enclosure indicating the fault current of the system.
- B. Fault current shall be calculated at the utility transformer, using an assumed infinite primary bus, and using the actual transformer impedance and kVa values.
- C. Red laminate with white core.
- D. Letter height: minimum ¼"

E. Legend

SERVICE AVAILABLE FAULT CURRENT: _____
TRANSFORMER KVA: _____
TRANSFORMER IMPEDANCE: _____
DATE: _____

END OF SECTION

SECTION 26 0583

CONNECTIONS TO EQUIPMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. The Contractor shall provide operational electrical connections to all electrically driven or controlled equipment.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General

1. The Contractor shall provide all necessary materials and labor required to make final operational connections to all equipment, generally as shown on the Drawings, and specifically as required by equipment specifications and installation literature.
2. Control devices and panels furnished by others will be delivered to the contractor at the jobsite, and shall be installed in accordance with manufacturer's printed instructions. Review equipment specifications to determine extent of work involved.

PART 3 – EXECUTION

3.1 GENERAL

- A. Provide operational connections for all equipment shown on the Drawings. Connections shall be in accordance with manufacturer's recommendations, and shall be left operating in a manner acceptable to the Engineer and Owner.
- B. Provide available fault current calculations for equipment listed in Section 260500-1.4E based on actual installation criteria (conductor lengths, raceway types, etc.). Calculations shall incorporate the current limiting effects of fuses supplied with local disconnecting means. Include calculation information in Record Manuals.
- C. For all exterior mechanical equipment, provide weatherproof GFCI receptacle outlet within 25' of equipment, circuited to nearest unswitched power. Refer to NEC 210.63 and 406.8.
- D. For all mechanical equipment located in attic and crawl spaces, provide porcelain lamp holder with integral receptacle and lamp guard, circuited to nearest unswitched power via pilot handle toggle switch near access hatch. Engrave plate. Refer to NEC 210.70(C).

3.2 CLEANING

- A. **Clean and vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 26 0943

DIGITAL LIGHTING CONTROLS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. It is the intent of this Specification to provide all necessary equipment as detailed, for a complete lighting control system.
2. The work included under this Specification shall cover:
 - a. All labor, materials and equipment to furnish the lighting control system herein specified.
3. The work shall include the services of a commissioning agent. The commission agent shall be a factory-trained representative who shall commission the system for proper operation and instruct the Owner as to proper operation, programming, and maintenance.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Submit floor plan drawing indicating all device locations and circuitry requirements between devices.
3. Provide connection/riser diagram for specific project involved. Upon Engineer's review, provide **additional three** copies for Contractor use at the project site and for Record Drawing/Manual submittal at project closeout.

B. Manuals

1. Provide information in accordance with Section 260500. Manuals shall include descriptions of equipment and methods of maintenance and operations.

PART 2 – PRODUCTS

2.1 CONTROL SYSTEM COMPONENTS

A. Component communication shall be by low voltage hard wired protocol and/or by a wireless mesh network.

B. Switches, modules, and sensors shall be as indicated on the drawings.

1. Unless otherwise indicated on the Drawings, wall switches for wireless control systems shall be powered by line voltage. Battery powered devices not acceptable.
2. Battery powered wireless daylight sensors shall be acceptable.
3. Switching relays that are utilized for emergency egress lighting shall be in conformance with UL 924.

2.2 SEQUENCE OF OPERATIONS

- A. The following descriptions are intended to provide a baseline operational platform for the system. All specific operating points shall be verified with the end user. If not acceptable to the end user, alternative points shall be offered and approved by the Engineer.
 - 1. Individual Office:
 - a. Occupancy Sensors shall operate in Occupancy Mode (auto on, auto off) after 30 minutes.
 - 2. Corridors
 - a. Schedule as directly by owner.
 - b. Wall switches deactivated during scheduled “on” time.
 - c. Off sweep every 2 hours of scheduled “off” time.

PART 3 – EXECUTION

3.1 STORAGE

- A. Store Lighting Control Components in a cool, dry space prior to installation.

3.2 INSTALLATION

- A. General
 - 1. Install where shown on Drawings, plumb and level.
 - 2. Top of trim 6’-3” above finished floor for wall-mounted panel.
 - 3. Conductors neatly dressed and banded with nylon cable ties.
 - 4. From each flush installation, stub three additional 3/4” conduits into nearest accessible ceiling space to provide for future utilization of spare circuits.
 - 5. Provide 3/4” plywood backing for all surface-mounted panels.
 - 6. Provide individual terminal or lug for each wire. Multiple wires to common terminal or several terminals for single stranded conductor not acceptable.
- B. Provide low voltage cabling from control panel to peripheral devices as per manufacturer’s instructions. Provide raceway system where concealed in walls, in mechanical rooms, and rooms without accessible ceilings. Cable shall be plenum-rated where installed above accessible ceilings and not in raceway.
- C. Provide engraved identification nameplate for system cabinet as per Specification 260553.
- D. Provide control station identification as per Drawings.

3.3 TESTS

- A. Upon completion of the installation, the system shall be commissioned by the manufacturer’s factory authorized representative. The commissioning agent shall configure the system as per the sequence of operation, make any adjustments/additions to the configuration as required or instructed, and verify the complete operation of the entire system.
 - 1. Electrical contractor shall notify owner and engineer twenty one (21) working days in advance to scheduling system commissioning.

- B. Furnish a letter of verification to Engineer indicating that the system has been tested and configured by manufacturer's representative and is found to be complete and functional. List date of test and name of manufacturer's representative. Testing to include a functional test of all devices and verification of proper configuration for all devices. Notify Owner and Engineer one week in advance of scheduled tests.
- C. As part of the required project close out Record Manuals, provide documentation on the commissioning of the system including room by room description indicating:
 - 1. Sensor parameters, time delays, sensitivities and daylighting setpoints.
 - 2. Sequence of operation, (e.g. manual ON, Auto OFF. etc).
 - 3. Load parameters (e.g. blink warning, etc).

3.4 INSTRUCTIONS

- A. After system commissioning is complete, the commissioning agent shall provide the Owner with complete instructions as to proper operation and maintenance of the lighting control system.
- B. Record instructions and include with manual in accordance with Section 260500.

3.5 CLEANING

- A. **Clean and vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

**SECTION 26 2416
PANELBOARDS****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide panelboards where indicated and scheduled.

1.2 SUBMITTALS**A. Shop Drawings:**

1. Submit information in accordance with Section 260500. Show all details of:
 - a. Lugs.
 - b. Locations for grounding bar, neutral bar and directory.
 - c. Main bus amperage and arrangement.
 - d. Weight and physical dimensions of enclosures.
 - e. Cover and lock type.
 - f. Quantity of spaces.
 - g. Quantity, arrangement, amperage and short circuit withstand ratings in RMS amperes for all circuit breakers.
 - h. Any other pertinent data.
 - i. Applicable series rating for this particular riser/fault current combination.

B. Record Manuals

1. Submit information in accordance with Section 260500.
 - a. Include fault current available at buss. Fault current calculations shall be based on actual installation criteria (conductor lengths, raceway types, etc.)
2. Include installation and maintenance instructions accompanying equipment.

PART 2 – PRODUCTS**2.1 MANUFACTURER**

- A. Product of same manufacturer.
- B. Sizing and design based upon Eaton equipment; Eaton catalog numbers utilized for reference.
- C. Other Acceptable Manufacturers.
 1. Approved equal units by Siemens or Square D.
- D. Contractor is cautioned to verify all physical dimensions of "equal" units prior to accepting quotation for bid.

2.2 GENERAL

- A. Provide sub-feed lugs, contactors, main breakers or other equipment as scheduled.
- B. Provide copper bus, copper isolated neutral bar and copper grounding bar in all panelboards.
- C. Use load centers only where specifically indicated. Provide copper bus with plated aluminum neutral and grounding bar.
- D. NRTL-listed, and "suitable for use as service equipment" when required.
- E. Feeder risers are schematic only and not intended to infer lug arrangements. Contractor to indicate desired lug arrangements and sizes on shop drawings.
- F. Connection from load side of main breaker to panel bus shall be bus bar. Insulated wire and backfed types not acceptable.
- G. NRTL-recognized series ratings acceptable, with minimum ratings as specified herein.

2.3 BRANCH CIRCUIT PANELBOARDS

- A. Circuit Breakers
 - 1. Bolt-on.
 - 2. Breaker Types:
 - a. Under 400 ampere: Quick-make, quick-break, thermal magnetic unless otherwise indicated.
 - b. 400 ampere and over: Solid-state molded case circuit breakers:
 - 1) Breakers shall contain electronic sensing, timing and tripping circuits.
 - a) Long time current
 - (i) Adjustable current pickup
 - (ii) Adjustable time delay
 - b) Short time current
 - (i) Adjustable current pickup
 - (ii) Adjustable time delay
 - c) Instantaneous current
 - (i) Adjustable current pickup
 - d) Ground fault.
 - (i) Where required by the NEC unless otherwise indicated
 - (ii) Adjustable current pickup
 - (iii) Adjustable time delay
 - 2) Include energy reducing maintenance switch with indicating light for
 - a) Devices serving as Service Disconnect.
 - b) Devices serving as Main Disconnect of separately derived systems.
 - c) All breakers greater than 1000 amps.
 - 3. Trip indicating.
 - 4. Common trip on multi-pole breakers; handle ties not acceptable.
 - 5. Minimum SCCR rating:
 - a. NRTL tested and certified series combinations acceptable.
 - 1) 10,000 for systems up to 240 volts.

6. Single pole 15 and 20 ampere ratings to be NRTL-listed as "Switching Breakers" and carry SWD marking.
7. FIRE ALARM EQUIPMENT
 - a. Circuit breakers feeding fire alarm control panels and/or other fire alarm equipment shall be equipped with a pad-locking device capable of locking the circuit breaker in the closed position.

B. Bus Assembly and Temperature Rise

1. Rating: As scheduled.
2. 98 percent conductivity.
3. "Distributed phase" or "Phase sequence" type bus bar connections.
4. Adjacent single pole breakers connected to opposite polarities.
5. Multi-pole breakers installable in any location.
6. Provisions for additional breakers such that field addition of connectors or mounting hardware will not be required.

C. Wiring Terminals

1. NRTL-listed as suitable for type of conductor specified.

D. Circuit Numbering

1. Starting at top, odd numbers in sequence down lefthand side and even numbers in sequence down righthand side.

E. Cabinet

1. Enclose bus assembly in steel cabinet.
2. Wiring gutter sizes and steel gauge in accordance with NEMA and NRTL standards.
3. Fabricate box from galvanized steel or equivalent rust resistant steel.
4. Furnish **without** pre-punched knockouts.

F. Fronts

1. Code gauge, full finished steel with rust inhibiting primer and baked enamel finish.
2. Not removable with door in locked position.
3. Adjustable trim clamps.
4. Concealed steel hinges.
5. Door with tumbler-type cylinder lock, catch and spring-loaded door pull.
6. Flush lock not to protrude beyond door front.
7. Key all locks alike.
8. Circuit directory frame and card with clear plastic covering on inside of door.

G. Manufacturer

1. Eaton Pow-R-Line series.

2.4 POWER DISTRIBUTION PANELBOARDS

A. Circuit Breakers

1. Bolt-on.
2. Breaker Types:
 - a. Under 400 ampere: Quick-make, quick-break, thermal magnetic.
 - b. 400 ampere and over: Solid-state molded case circuit breakers:
 - 1) Breakers shall contain electronic sensing, timing and tripping circuits.
 - a) Long time current
 - (i) Adjustable current pickup
 - (ii) Adjustable time delay
 - b) Short time current
 - (i) Adjustable current pickup
 - (ii) Adjustable time delay
 - c) Instantaneous current
 - (i) Adjustable current pickup
 - d) Ground fault, where required, with integral test and reset buttons.
 - (i) Adjustable current pickup
 - (ii) Adjustable time delay
 - 2) Main disconnect devices shall include maintenance-mode override.
3. Trip indicating.
4. Common trip on multi-pole breakers; handle ties not acceptable.
5. Equipped with individually insulated braces and protected connectors.
6. Front faces of all circuit breakers to be flush with each other.
7. Affix large, permanent, individual circuit numbers to each breaker in uniform position.
8. Minimum 35,000 SCCR rated.
 - a. NRTL tested and certified series combinations acceptable.

B. Bus Assembly and Temperature Rise

1. Rating: As scheduled.
2. Insulated bus structure.
3. 98 percent conductivity.
4. "Distributed phase" or "phase sequence" type bus bar connections.
5. Adjacent single pole breakers connected to opposite polarities.

C. Wiring terminals

1. NRTL-listed as suitable for type of conductor specified.

D. Cabinet

1. Enclose bus assembly in steel cabinet.
2. Wiring gutter sizes and steel gauge in accordance with NEMA and NRTL standards.
3. Fabricate box from galvanized steel or equivalent rust resistant steel.
4. Furnish **without** pre-punched knock-outs.

E. Fronts

1. Minimum 12-gauge, full finished steel with rust inhibiting primer and baked enamel finish.
2. Circuit directory frame and card with clear plastic covering.

F. Safety Barriers

1. As required by UL or other NRTL.

G. Manufacturer

1. Eaton Pow-R-Line series.

2.5 CABLE TIES

- A. Thomas and Betts Company "Ty-Rap" or equivalent.

2.6 PLYWOOD BACKING FOR SURFACE MOUNTED PANELBOARDS.

- A. 3/4" grade AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION**3.1 STORAGE**

- A. Store panelboards in a cool, dry area prior to installation.

3.2 INSTALLATION**A. General**

1. Install where shown on Drawings, plumb and level.
2. Top of trim 6'-3" above finished floor for wall-mounted panelboard.
3. Adjust operating mechanism for free mechanical movement.
4. Conductors neatly dressed and banded with nylon cable ties after final load balancing.
5. From each flush installation, stub three additional 3/4" conduits into nearest accessible ceiling space to provide for future utilization of spare circuits.
6. Provide 3/4" plywood backing for all surface-mounted panelboards.
7. Tighten all lugs in accordance with manufacturer's recommendations.
8. For all fusible distribution panelboards, arrange devices in descending order such that bussed space is at top and largest devices are at bottom.
9. Provide individual terminal or lug for each wire. Multiple wires to common terminal, or several terminals for single stranded conductor not acceptable.

B. Identification

1. Identify panelboards and directories in accordance with Section 260553.
2. Provide nameplate similar to following example:

PANEL L6
120/208 VOLT 3Ø 4W
2" C – 4 #3/0
FED FROM SWBD #1

3. When required, provide identification as per NEC 210.5(C) at each branch circuit panelboard.

C. Concrete Pad

1. Locate floor mounted panelboard on concrete pad.
2. Dimensions: 4" high and extend 4" from front and sides.
3. Provided by Division 26. Coordinate installation.

3.3 TESTS

A. Balancing Load

1. Circuiting shown on Drawings is designed to produce equal loading on all phases.
2. Under actual operating, check and make circuit adjustments as required to produce balanced condition.

B. GFPE Testing

1. Performed when first installed on site, prior to being energized by utility transformer.
2. Primary current injection method shall be used for testing purposes per NEC 230.95-C.
3. Conducted in accordance with manufacturer's instructions.
4. Conducted in presence of manufacturer's representative.
5. Provide letter of verification to Engineer indicating:
 - a. Date of test.
 - b. Name of manufacturer's representative present.

3.4 CLEANING

- A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

**SECTION 26 2713
ELECTRIC SERVICE****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide electrical service from Mountrail-Williams's point of connection to main switch.

B. Description of System

1. 120/208 V, 3 Phase, 4 Wire

PART 2 – PRODUCTS**2.1 METERING****A. Feed through metering****B. Utility company to furnish all instrument transformers and meters.****C. Meter Sockets: Provide as required by utility company.****2.2 TRANSITION CABINETS****A. Construction**

1. 12-gauge galvanized phosphated steel.
2. Primed and painted one coat forest green enamel.
3. Lift off covers - both sides.
4. Padlocking handle with two point latch mechanism.
5. Penta head sealing bolt.
6. No trough openings, or furnish NEMA 3R cover plates.

B. Bus Assembly

1. Amperage as indicated on Drawings.
2. Copper bus bar.
3. Prepunched to NEMA standards for up to five utility company lugs.
4. Compression lugs on load side.
5. Ground stud.
6. Provision for bar type CT's.

C. Manufacturer: Shallbetter CB series, or approved equal by American Midwest Power, Inc., Electro Mechanical Industries, Inc., or States Electric Mfg. Co.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Verify with utility company prior to Bid all specific equipment requirements, installation requirements and fees particular to this service installation and make allowances thereto.
- B. Include in Bid all utility company fees and charges associated with service installation.
- C. Include in Bid all miscellaneous lugs, ground rods, site and pad conduits, sleeves, and other appurtenances required for service installation and not provided by utility company.
- D. Transformer and Equipment Pads
 - 1. Concrete pads provided by Division 26.
 - 2. Size per utility company requirements.
 - 3. Coordinate installation.
- E. Contractor totally responsible for all utility company coordination, metering equipment placement, and transformer location, with respect to service installation.
- F. Service installation shall comply with utility company rules and regulations.
- G. Cabinets
 - 1. Install cabinets in accordance with Code, product listing and manufacturer's recommendations.
 - 2. Install where shown on Drawings.
 - 3. Plumb and level.
 - 4. Top of trim 6'-3" above finished floor.

3.2 IDENTIFICATION

- A. Identify cabinets with nameplates in accordance with Section 260553.
- B. Inscription as directed by Engineer.
- C. Provide available fault current calculations for cabinets based on actual installation criteria (conductor lengths, raceway types, etc.). Include calculation information in Record Manuals.

3.3 CLEAN UP

- A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 26 2726**WIRING DEVICES AND DEVICE PLATES****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide wiring devices complete with device plates of matching or specified color. Wiring devices include receptacles for the connection of portable equipment and switches used for the control of both lighting and fractional horsepower motor loads. Also included are dimmers, occupancy sensors, photoelectric switches and time switches.

B. Work Installed But Furnished by Others

1. Where indicated, install devices furnished by other Divisions of this Specification.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500.

B. Record Manuals

1. Provide information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying the equipment.

PART 2 – PRODUCTS**2.1 GENERAL**

- A. Device color: Gray or as selected by Architect. Verify with Architect. (Exception: Red devices on emergency circuits where applicable).
- B. All devices shall be of the same manufacturer, except where specifically noted otherwise with the phrase "NO SUBSTITUTION".

2.2 SWITCHES**A. AC Toggle and Keyed Switches**

1. 20-ampere 120/277 volt AC and HP rated.
2. Industrial Grade.
3. Color coded face or body by amperage.
4. Screw pressure plate back wire and side wire.
5. Federal Spec WS-896 listed.
6. Acceptable Manufacturers:
 - a. Cooper 2220 series
 - b. Hubbell 1220 series

- | | | |
|----|----------------|---------------|
| c. | Leviton | 1220 series |
| d. | Pass & Seymour | PS20AC series |

B. Pilot Light Switches

1. Neon lamp in red toggle handle, lit in "on" position.
2. 20 ampere, 120/277 volt AC rated.
3. Manufacturer: As listed above.

C. Time Switches

1. Two Circuit SPST switching, voltage rating as required.
2. Digital display with 7-Day programming.
3. Non-volatile program memory (battery backup unacceptable).
4. Manufacturer: Intermatic #ET2725 series.
5. Other acceptable manufacturer: Tork.
6. Special units as shown on Drawings.

D. Remote Photoelectric Switches

1. Threaded swivel mounting with locking nut and neoprene gasket.
2. Light level adjustment slide.
3. Activation: 1-5 footcandle on, 3-15 footcandle off.
4. Manufacturer: Intermatic #K4200 series, wattage and voltage as required.
5. Other acceptable manufacturers: Paragon, Area Lighting Research, Precision, or Tork.

E. Spring Wound Timer Switch

1. As shown on Drawings.
2. Manufacturer: Intermatic.
3. Other acceptable manufacturers: Area Lighting Research, Rhodes Mark Time, or Tork.

F. Occupancy Sensors

1. Wall Mount
 - a. Self-contained line voltage unit with passive infrared sensing.
 - b. Rating: 120 VAC @ 800 watts, 240/277 VAC @ 1200 watts, electronic ballast rating. No minimum load requirements
 - c. PIR collector beams view out horizontally 35 feet in a wall-to-wall pattern, with a 20-foot effectiveness for small hand or body motions.
 - d. Adjustable time delay, from 5 to 20 minutes, with "OFF" override switch.
 - e. Automatic adjustment option for continuous time of day usage monitoring with automatic off delay adjustment.
 - f. Bypass mode to allow override button to act as a standard on-off switch in case of sensor failure.
 - g. Vandal resistant lens.
 - h. LED activity Indicator.
 - i. Multi-way version:
 - 1) Simultaneous load control from up to four device locations.
 - j. Dual-level version (ab switching):
 - 1) Two separate relays with dual override switches.

- 2) Independent Auto or Manual mode per relay.
- k. Manufacturer: WattStopper PW series, Sensorswitch WSX series, Leviton OSSMT series, Hubbell LHIR series, or approved equal.

2.3 RECEPTACLES

A. General Purpose

1. 20 ampere, self-grounding, NEMA 5-20R, industrial specification grade.
2. Nylon face with finger grooves and compact body.
3. Minimum 0.032" triple wipe brass contacts.
4. Corrosion resistant steel strap interlocked with face and body.
5. Screw pressure plate back wire and side wire.
6. Tamper resistant.
7. Federal Spec WC-596 listed.
8. Acceptable Manufacturers:

a. Arrow Hart	TR5362xx
b. Hubbell	HBL5362xxTR
c. Leviton	5362-SGxx
d. Pass & Seymour	TR5362xx

B. GFCI

1. 20 ampere, feed-through type.
2. Two utilization points per device, with vertical orientation.
3. Tamper Resistant.
4. Manufacturer: As listed above.

C. Combination Duplex and USB Charging

1. 20 ampere, Decora style.
2. Two utilization points per device, with vertical orientation.
 - a. Includes one USB-A port.
 - b. Includes one USB-C port.
3. 5 ampere, 5 Volt USB output.
4. Tamper resistant.
5. Manufacturers:

a. Arrow Hart	TRUSBAC20
b. Hubbell	USB20ACPD
c. Leviton	M58AC
d. Pass & Seymour	TR20USBAC6.

D. Damp & Wet Locations

1. All 15 and 20 ampere, 125 and 250 volt non-locking receptacles shall be listed weather-resistant type as per NEC 406.9(A) and 406.9(B)(1).
2. Manufacturer: As listed above.

2.4 DEVICE PLATES

A. Flush Interior

1. Opening for device intended.
2. 430 or 302/304 stainless steel, or as selected by Architect.
3. Where plastic plates are selected by Architect, provide thermoplastic type.
4. Manufacturer: Cooper, Hubbell, Leviton and Pass & Seymour.

B. Surface Interior

1. 1/2" raised cover

C. Damp & Wet Locations

1. Damp locations:
 - a. Refer to NEC 406.9(A).
 - b. Die-cast aluminum construction with stainless steel springs.
 - c. Unless indicated otherwise on the Drawings, Manufacturer: Pass & Seymour #4500 series or equivalent.
2. Wet locations:
 - a. Refer to NEC 406.9(B).
 - b. Unless indicated otherwise on the Drawings, Manufacturer: Red Dot #CKMU (horizontal) or #CKMUV (vertical), or approved equal by Hubbell.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Install device and plates where shown on Drawings in accordance with Code, product listing and manufacturer's recommendations.
2. Refer to Section 260534-3.1C for mounting heights.
3. Plumb and level.
4. Tight to wall.
5. Thoroughly cover wall opening around device.
6. Replace all devices and plates that become discolored or burned during construction.
7. Provide blank plates for unused openings.
8. Connect wiring devices by means of single conductor tails. Multiple wire connections not acceptable.
9. Tighten unused connection screws.

B. Identification

1. Identify wall switches which control lighting or equipment not in sight.
2. Refer to Section 260553-3.1C.

C. Receptacles

1. Vertical mounting with grounding pole at bottom.

2. Provide GFCI receptacles at NEC 210.8 locations.

D. Photoelectric Switches

1. Install on roof, in center of structure where viewing from ground is minimal.
2. Verify exact location with Architect.
3. Penetrate roof with 3/4" RGSC, securely fastened to structure.
4. Provide flashing to maintain roof integrity.
5. Mount 18" above finished roof surface.
6. Make connections in weatherproof junction box.

E. Occupancy Sensors

1. Provide adequate supports to any structures, ceilings and grid system to safely attach sensors.
2. Mount external power packs (required only for low voltage sensors) within junction box in accessible ceiling space.
3. Verify operating parameters with Engineer.

3.2 TESTS

- A. Proper operation of lighting switches, dimmers and occupancy sensors.

B. Duplex Receptacles

1. Proper connections.
2. Test all receptacles with NRTL listed receptacle circuit tester similar to Bryant #5266-PT, or Ideal #EZ Check.

3.3 INSTRUCTIONS

- A. Instruct Owner's personnel in proper operation, setting, and maintenance of time switches, dimmers, occupancy sensors, and GFCI receptacles.

END OF SECTION

**SECTION 26 2813
FUSES****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide all fuses as required.

B. Work Furnished But Not Installed

1. Provide spare fuses for all sizes and classes required.
2. Quantity: 10%, with a minimum of three each rating, including motor starter control transformer fusing.

1.2 SUBMITTALS**A. Record Drawings**

1. Indicate actual class, type and size of fuse installed in each device.

B. Record Manuals

1. Submit information in accordance with Section 260500.

PART 2 – PRODUCTS**2.1 FUSES****A. 600 Amperes and Less Protecting Feeders or Combination Motor/Branch Circuit Loads.**

1. UL-listed, Class RK-1.
2. Manufacturer: Bussmann LPN-RK/LPS-RK, Littelfuse LLN-RK/LLS-RK, or Brush LEN-R/LES-R.

B. Motor Starter Control Transformers

1. As recommended by manufacturer.

C. Plug Fuses

1. Dual element, UL-listed Type S with adapter.
2. Use only as indicated on Drawings for fused toggle switches.

PART 3 – EXECUTION**3.1 STORAGE**

- A. Store fuses in a cool, dry space prior to installation.

3.2 INSTALLATION

- A. General

- 1. Install fuses in accordance with Code, product listing and manufacturer's recommendations.
 - 2. Verify equipment fuse sized for load prior to installation.
 - 3. All fuses shall be of same manufacturer.
 - 4. Do not mix fuse classes in individual applications.
 - 5. Fuses are not required for switchboard devices marked "Spare".

- B. Identification

- 1. Indicate on inside cover with pressure sensitive tape the size, voltage and type of fuse furnished for each device.

END OF SECTION

**SECTION 26 2816
ENCLOSED SWITCHES & CIRCUIT BREAKERS****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide disconnects where shown on Drawings or required by Code.
2. Provide enclosed circuit breaker where shown on the Drawings.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500.
2. Indicate on submittal exact motor or equipment served.
3. Show all details including electrical ratings, enclosure dimensions and other pertinent data.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying the equipment.

PART 2 – PRODUCTS**2.1 DISCONNECT SWITCHES****A. Switch Interior**

1. Positive “off” position.
2. Lugs: NRTL-listed for aluminum and copper cable.
3. Plated current carrying parts.

B. Switch Mechanism

1. Quick-make, quick-break operating handle and mechanism.
2. Integral part of box.
3. Enclosures: Code gauge sheet steel (NEMA 1) or Code gauge galvanized steel (NEMA 3R).
4. Treat with rust-inhibiting phosphate primer.
5. Finish: Baked enamel.

C. Ratings

1. 240 or 600 volt.
2. Heavy duty.
3. Horsepower rated.
4. NRTL-listed "Suitable for Use as Service Equipment" when required.

D. Fusing

1. NRTL-listed rejection feature.
2. Reject all fuses except UL-listed Class R.

E. Manufacturer: Panelboard manufacturer.**2.2 ENCLOSED CIRCUIT BREAKERS****A. Breaker Types:**

1. Under 400 ampere: Quick-make, quick-break, thermal magnetic unless otherwise indicated.
2. 400 ampere and over: Solid-state molded case circuit breakers:
 - a. Breakers shall contain electronic sensing, timing and tripping circuits.
 - 1) Long time current
 - a) Adjustable current pickup
 - b) Adjustable time delay
 - 2) Short time current
 - a) Adjustable current pickup
 - b) Adjustable time delay
 - 3) Instantaneous current
 - a) Adjustable current pickup
 - 4) Ground fault
 - a) Where required by the NEC unless otherwise indicated
 - b) Adjustable current pickup
 - c) Adjustable time delay
 - b. Include energy reducing maintenance switch with indicating light for
 - 1) Devices serving as Service Disconnect.
 - 2) Devices serving as Main Disconnect of separately derived systems.
 - 3) All breakers greater than 1000 amps.
3. Trip indicating.
4. Minimum SCCR rating:
 - a. 10,000 for systems up to 240 volts.

B. Manufacturer: Panelboard manufacturer.**2.3 PLYWOOD BACKING FOR SURFACE MOUNTED SWITCHES**

- A. For interior locations, mount on 3/4" AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION**3.1 STORAGE**

- A. Store disconnect switches or enclosed circuit breakers in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install all required disconnect switches or enclosed circuit breakers in accordance with Code, product listing and manufacturer's recommendations.
2. Plumb and level.
3. Tighten lugs in accordance with manufacturer's recommendations.

B. Identification

1. Identify disconnect switches or enclosed circuit breakers in accordance with Section 260553.
2. Nameplate required for all disconnect switches. Nameplate to include load served, voltage, horsepower or MCA rating, and fuse size. Nameplate to be installed inside of cover on exterior disconnect switches.

Example:

RT-1
480 Volt, 3 Ø
35 MCA, 40 A Fuses

3. Do not use schedule number, but indicate load served.
4. Pressure sensitive tape identification for disconnect switches containing fuses.
5. Voltage markers on all disconnect switches containing system voltages in excess of 250 volts to ground.

3.3 TESTING

A. GFPE Testing

1. Performed when first installed on site, prior to being energized by utility transformer.
2. Primary current injection method shall be used for testing purposes per NEC 230.95-C.
3. Conducted in accordance with manufacturer's instructions.
4. Conducted in presence of manufacturer's representative.
5. Provide letter of verification to Engineer indicating:
 - a. Date of test.
 - b. Name of manufacturer's representative present.

3.4 CLEANING

- A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

**SECTION 26 2913
MOTOR STARTERS****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide motor starters where shown and scheduled, or as required by Code.

B. Work Installed But Furnished Under Other Directives

1. Refer to Section 260500, Article 1.1, Paragraph D for extent of control devices furnished in other Divisions.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500.
2. Show all details including electrical ratings, controls, schematic wiring diagrams, enclosure dimensions and other pertinent data.
3. Indicate on submittal exact motor or equipment served.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying the equipment.

PART 2 – PRODUCTS**2.1 GENERAL**

- A. Product of same manufacturer.
- B. Sizing based upon Eaton equipment.
- C. Other acceptable manufacturers: Approved equal units by Allen Bradley, Schneider, and Siemens.
- D. Contractor is cautioned to verify all physical dimensions of "equal" units prior to accepting quotation for Bid.

2.2 SINGLE PHASE MOTORS WITH INTEGRAL OVERLOAD PROTECTION

- A. Horsepower rated toggle switch, pilot handle where not in sight from motor.

2.3 SINGLE PHASE MOTORS WITHOUT INTEGRAL OVERLOAD PROTECTION

A. Manual Motor Starter

1. Manually operated toggle switch with integral overload protection.
2. Rendered inoperative unless thermal unit is in position.
3. Provide pilot light for manual starters not in sight from motor.
4. Provide flush-mounted starters with stainless steel plates.
5. NEMA 1 enclosures for surface-mounted starters unless otherwise required by environment.

B. Fused Toggle Switch

1. 4" square box mounting.
2. Complete with fuse adapter and plug fuse of correct rating.
3. Manufacturer: Bussmann or Reliance.
4. **Use only where specifically shown.**

2.4 THREE PHASE AND SPECIFIED SINGLE PHASE MOTORS

A. Across-the-line

1. Magnetic type, non-reversing unless otherwise scheduled.
2. Rated in accordance with NEMA standards, sizes and horsepower ratings.
3. Provide combination fusible unit with Class R fuse holders, where disconnect and starter are shown at the same location.
4. Minimum size: NEMA size 0.
5. Manufacturer's series: Eaton Freedom series, or approved equal units by Allen Bradley 512 series, Schneider 8538 series or Siemens Class 17 series.
6. Control
 - a. 120 volt control transformer
 - b. Control fusing:
 - 1) 250 volt - in accordance with NEC.
 - 2) 600 volt - primary and secondary fusing regardless of VA rating of control transformer.
 - c. Cover-mounted devices for single-speed starters:
 - 1) Transformer operated LED green pilot light for running indication, with push-to-test feature.
 - 2) H-O-A selector switch, unless otherwise scheduled.
 - d. Cover-mounted devices for two-speed starters:
 - 1) Transformer operated LED pilot lights for running indication, with push-to-test feature: Green for low speed, amber for high speed).
 - 2) High-low-off-auto selector switch, unless otherwise scheduled.
 - e. Molded coil construction.
7. Overload Protection – exterior locations
 - a. Resettable overload protection on all phases.
 - b. Class 20 construction.
 - c. Starter inoperative if one or more overload units removed.

8. Overload Protection – interior locations
 - a. Self-powered.
 - b. Solid state construction with adjustable overload protection on all phases.
 - c. Manual reset with capability for remote reset function.
 - d. Phase loss protection.
 - e. Ambient-insensitive within operating range of -25°C to 55°C.
 - f. Solid state construction, Class 20.
 - g. Starter inoperative if overload unit is removed.
9. Electrical Interlocks
 - a. Space for minimum three, any arrangement NO or NC.
 - b. Quantity: Two NO per starter.
- B. Solid State Starters
 1. Control and interlock options as previously indicated.
 2. Run bypass contactor.
 3. Class 20 overload protection.
 4. Heavy-duty rating.
 5. Temperature: NRTL-listed for -30 to 50°C ambient.
 6. Rated for 4 starts per hour
 7. Adjustable ramp times, torque control, and kick start.
 8. Solid state reduced voltage type: Eaton 801+ Series.
 9. Other acceptable manufacturers: As previously indicated.
- C. Variable Frequency Drive
 1. Normal duty packaged combination unit, non-bypass type in fan/filter cooled NEMA 1 enclosure.
 2. Integral disconnect shall be Fused switch type. 100K AIC Rated.
 3. Full numeric operator keypad with LCD display interface mounted on dead front cover.
 4. Hand-Off-Auto selector switch.
 5. Transformer operated LED amber pilot light for fault indication, with push-to-test feature
 6. Integral 3% Line reactor.
 7. Variable Torque.
 8. Selectable switching frequency.
 - a. 2kHz to 12k Hz
 - b. Automatic reduction under excessive heat sink temperatures.
 9. Minimum I/O
 - a. 5 Digital Inputs
 - b. 2 Analog Inputs
 - c. 2 NO/NC Relay Outputs
 - d. 1 Analog Output
 10. Communications protocol
 - a. Ethernet/IP, Modbus, BACnet.
 11. Manufacturer: Eaton PowerXL DG1 Series, Allen Bradley Powerflex 753 Series or Schneider Altivar 630 Series.

2.5 THREE PHASE POWER MONITOR

- A. Provide for all three phase motors larger than two horsepower, and all three phase compressor equipment.
 - 1. Not required for motors served by solid state starters or variable frequency drives.
- B. Line voltage to match system.
- C. Operating parameters:
 - 1. Trip: 90% rated voltage on any or all phases.
 - 2. Reset: 93% rated voltage on all three phases.
 - 3. Dead band between trip and reset: 3%.
 - 4. Repeat accuracy: 1% maximum at 0-70°C.
 - 5. Trip Delay Time: Two seconds.
 - 6. Reset: Two seconds.
 - 7. Output contact rating: Pilot Duty, 470 VA @ 600 VAC.
 - 8. Transient Protection: 2500 Volts for 10 MS.
- D. Special Options
 - 1. NEMA 1 or 3R enclosure as required.
 - 2. Adjustable Time Delayed Restart: 30-300 seconds. Set at 300 seconds.
- E. Manufacturer: Motor Saver Model 350.
- F. Other acceptable manufacturers: Eaton #D65 series.

2.6 PLYWOOD BACKING FOR SURFACE MOUNTED STARTERS

- A. 3/4" grade AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION

3.1 STORAGE

- A. Store motor starters in cool, dry space prior to installation.

3.2 INSTALLATION

- A. General
 - 1. Plumb and level.
 - 2. Install motor starters in accordance with Code, product listing and manufacturer's recommendations.
 - 3. Tighten all lugs in accordance with manufacturer's recommendations.
 - 4. Verify correct size overload protection with motor nameplate data and manufacturer's recommendations.
 - 5. Where power factor correction is specified for connection to motor terminals (i.e. load side of overload units), reduce overload rating as per manufacturer's recommendations.

6. Provide 3/4" plywood backing where several controls are shown grouped for surface mounting.

B. Identification

1. Identify motor starters in accordance with Section 260553.
2. Provide two nameplates for all motor starters: One for starter, other for equipment. Do not mount equipment nameplate on motor. Rather, mount on equipment, in visible location near motor.
3. Do not use motor schedule numbers, but indicate motor or load served.
4. Provide pressure-sensitive tape identification in accordance with Section 260553 and 262813 for all motor starters containing fuses.
5. Indicate proper thermal overload unit by circling correct number on chart affixed to cover of starter.
6. Provide voltage markers for all motor starters containing a system voltage in excess of 250 volts to ground.
7. Voltage markers not required for motor starters which form a part of a motor control center as specified in Section 262419.

3.3 TESTS

A. Proper operation.

B. Correct rotation.

C. Solid state motor starters

1. Furnish letter of verification to Engineer indicating solid state motor starters have been tested by manufacturer's representative.
2. List date of test and name of manufacturer's representative.

3.4 INSTRUCTIONS

- A. Manufacturer's representative shall instruct Owner in proper maintenance and testing of solid state motor starters. Include name of Owner's representative in letter of verification.
- B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

- A. **Clean and vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

**SECTION 26 4313
SURGE PROTECTIVE DEVICES****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide integral Surge Protective Device in panelboards and switchboards where indicated and scheduled.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying equipment.

PART 2 – PRODUCTS**2.1 TYPE 2 SURGE PROTECTIVE DEVICE (SPD)****A. Provided only in panelboards and switchboards as indicated on the drawings.****B. The panelboard/switchboard manufacturer shall internally install SPD protection within the panelboard and the entire assembly shall be UL 67 listed.****C. SPD requirements:**

1. Listed and component recognized in accordance with latest editions of UL 1449, UL 96A and UL 1283.
2. Minimum surge capacity ratings as indicated on the drawings. Operating voltage and configuration as indicated on the drawings
3. 200kA Short Circuit Current Rating (SCCR). SPD devices obtaining SCCRs using upstream over current protection are prohibited.
4. 20kA nominal discharge current.
5. EMI/RFI noise filtering attenuation up to 50dB for 10kHz – 100MHz.
6. Self contained module design, with each suppression element metal-oxide varistor (MOV) based incorporating thermal protection. End of life mode shall be open circuit.
7. Surge current diversion paths between each phase conductor and the neutral conductor, between each phase conductor and the ground and between the neutral conductor and ground. For delta configured systems, the SPD shall have components connected between each phase conductor and between each phase conductor and ground.

8. UL 1449 latest edition listed and recognized component voltage protection rating (VPR) shall not exceed:

VOLTAGE	L-N	L-G	N-G	L-L
240/120 1Ø	700V	700V	700V	1200V
208Y/120	700V	700V	700V	1200V
240D/120	700/1200V	700/1200V	700V	1800V
480Y/277	1200V	1200V	1200V	2000V

9. Designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
10. Equipped with on board visual and audible diagnostic monitoring devices mounted on the front cover of the SPD.
- Indicating lights shall provide full time visual diagnostic monitoring of the operational status of each phase of the surge current diversion module.
 - Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm on/off switch shall be provided to silence the alarm.
 - LCD display surge counter located on the front cover of the SPD. Counter shall be equipped with a manual reset with protection from accidental operation and utilize non-volatile memory.
 - A set of Form "C" dry contacts shall be provided for remote annunciation.
11. Warranty: The panelboard manufacturer shall warranty the SPD for full replacement if destroyed by transients, including lightning, for a period of ten (10) years.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. SPD protection modules shall be factory installed by the panelboard/switchboard manufacturer integral to the panelboards/switchboards indicated on the drawings. Each entire assembly shall be UL 67 listed.

3.2 TESTS

- A. Verify all SPD equipment is active and in proper working condition prior to final project inspection.

3.3 CLEANING

- A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

**SECTION 26 5100
LUMINAIRES****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Furnish and install a complete luminaire for each lighting outlet.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500 including voltage, housing and door frame material, lens type, diffuser thickness, lumen output, and color temperature.

B. Record Manuals

1. Provide information in accordance with Section 260500.

1.3 COORDINATION

- A. Confirm compatibility and interface of luminaire with other materials and job conditions prior to ordering. Report discrepancies to Engineer and defer ordering until clarified.
- B. Provide frames, trim rings, and backboxes as required.
- C. Coordinate with work of all other Divisions to avoid conflicts between luminaires, supports, fittings and mechanical equipment. Ceiling clearances are minimal. It is imperative that Contractors coordinate conduit and duct runs to facilitate luminaire installation as shown on reflected ceiling plans. Engineer will not be responsible for interferences arising from lack of field coordination between trades.

PART 2 – PRODUCTS**2.1 LUMINAIRES****A. General**

1. UL or other NRTL listed.
2. Where shown to be installed in fire-rated assemblies, luminaires shall be listed in accordance with UL Standard 1598. Supplemental penetration protection (tenting) will be accomplished by General Contractor in accordance with UL Fire Resistance Directory. Coordinate installation with General Contractor. Supplemental protection shall be spaced minimum 1/2" away from the luminaire, per UL Standard 1598.
3. Verify ceiling finishes and equip all recessed luminaires with appropriate frames as required.
4. Furnish luminaires intended for use in lay-in grid ceilings with proper clips for compliance with NEC.

5. Refer to Section 260500 for "Prior Approval to Quote" procedure.

B. LED Lighting Systems

1. General: All LED lighting system components must be UL or other NRTL listed.
2. Light Engines:
 - a. Meets or exceeds 70% lumen maintenance at 50,000 hours based on IESNA LM-79-2008.
 - b. Minimum 80+ CRI rating.
 - c. 4000K color temperature, or as scheduled on drawings.
 - d. Minimum delivered lumens as scheduled on drawings.
3. Electronic drivers for LED's:
 - a. Factory installed.
 - b. Multi-volt for use on either 120v or 277v systems.
 - c. THD: < 20%.
 - d. Factory installed quick-disconnect plug internal to the luminaire for driver removal.
 - e. Rated for a minimum of 50,000 hours.
 - f. 0-10 Volt dimming standard. Provide non-dimming drivers only as scheduled.
 - 1) Controls and wiring as per manufacturer's recommendations. Provide power packs for wall-box dimmers as required for positive luminaire off.
4. Downlights shall incorporate integral diffuser type lens. Exposed modules not acceptable.
5. Emergency battery packs:
 - a. Include self-testing/self-diagnostics with audible alarm option.
 - b. Factory installed.
 - c. Minimum lumens as scheduled.
6. Spare Drivers:
 - a. Luminaire manufacturer shall keep reasonable driver stocks on hand for replacement of defective drivers under guarantee period.
7. Guarantee period: Minimum 60 months from date of substantial project completion.
 - a. Guarantee shall include all parts and labor required to bring luminaire to complete operation.
 - b. Labor shall be performed by an Owner approved Electrical Contractor licensed in the area the work is to be performed.
 - c. Any costs for equipment rentals required to service luminaires under warranty shall be the responsibility of luminaire manufacturer.

PART 3 – EXECUTION

3.1 STORAGE

- A. Store luminaires in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install luminaires plumb and true, free of light leaks, warps, dents and other irregularities.
2. Equip any outlets not specifically labeled with a luminaire the same as those in rooms used for similar purposes.

3. Run all directional lenses the same direction in rooms, corridors and other adjacent areas that contain square luminaires.
4. Continuous row luminaires: Hang level in straight line and butt tightly together.
5. Verify exact location of luminaires with reflected ceiling plan. Any discrepancies between the lighting plan, reflected ceiling plan, or installed ceilings shall be brought to the attention of the Engineer for clarification prior to installation.
6. Coordinate with Mechanical Contractor in advance of installation to prevent space conflicts.
7. Connect recessed luminaires to branch circuitry by means of single flexible metal conduit 6'-0" in length.

B. Barriers

1. Required where recessed luminaires are installed in insulated ceilings.
2. Suitable material to satisfy NRTL requirements.
3. Provided by Division 26 when not indicated otherwise.
4. Coordinate installation.

C. Luminaire Supports

1. Provide adequate supports to any structures, ceilings and grid systems to safely suspend or attach luminaires.
2. General Contractor to provide ceiling support systems as required by that portion of the Specifications. Electrical Contractor to provide any additional supports on an "as needed" basis to prevent ceiling from sagging or developing other irregularities.
3. Contractor responsible for providing proper suspension and mounting devices and to safely support all luminaires shown on Drawings, regardless of ceiling systems.
4. Rigidly support surface suspended ceiling system with anchors, hangers or clips designed for the purpose.
5. Support surface-mounted luminaires at four-foot intervals.
6. Install recessed luminaires in accordance with manufacturer's recommendations.
7. Rigidly support recessed luminaires to structural members or properly supported ceiling system with hangers, clips or fasteners designed for the purpose.
8. Support pendant and stem-hung luminaires at four-foot intervals.

D. 0 – 10 Volt Dimming Control Circuits

1. Installed in accordance with NEC Article 725.
2. Class 1 systems
 - a. #14 AWG THWN/THHN solid conductors installed in the same raceway as associated power wiring.
3. Class 2 systems
 - a. #18/2 non-shielded cable unless otherwise indicated on the drawings.
 - b. Plenum rated where required.
 - c. Cable shall be installed in raceway when concealed within walls, in mechanical rooms, and rooms without ceilings.
 - 1) DO NOT INSTALL IN SAME RACEWAY AS POWER CIRCUITRY.
 - d. Cable not required to be enclosed in raceway when installed above accessible ceilings.
 - 1) Route cables parallel or perpendicular to building construction.
 - 2) Support cables from building structure utilizing approved methods.

- 3) Neatly coil excess cable length of pre-terminated assemblies.
- 4) All cable runs shall be continuous between devices. NO SPLICING.

3.3 TESTS

- A. Upon completion of this portion of the Work and prior to its acceptance by Owner, check for proper alignment and operation of all lighting equipment.

3.4 CLEAN UP

- A. Clean all luminaires immediately prior to final inspection.

END OF SECTION

**SECTION 26 6500
KITCHEN EQUIPMENT WIRING****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide operational kitchen equipment connection for all units as scheduled on Architectural Drawings. Connection to include but not be limited to solenoid valves, hood lights, compressors, fire alarm and suppression interlocks, and other required accessories. Refer to Food Service Equipment Specifications and Supplier for extent of material furnished into equipment.
2. Provide operational walk-in refrigeration equipment connection for all units as scheduled on drawings. Connection to include but not be limited to control devices, lights, compressors, evaporators, interlocks, and other required accessories.

PART 2 – PRODUCTS**2.1 MATERIALS****A. Wire and Cables**

1. Where heating elements are involved in the equipment supplied, provide wire having suitable temperature rating for service conditions.

B. Raceway

1. Provide flexible conduit connections to equipment that must be removed for repair or maintenance.

C. Plate Covers

1. Provide stainless steel plates for all devices located in kitchen.

PART 3 – EXECUTION**3.1 COORDINATION**

- A. Location of outlet boxes, conduit, stubups and connection points are to be considered as typical only. Determine exact connection points from Shop Drawings for equipment.
- B. Confirm rating of each item of equipment with the equipment supplier before installing breakers and wiring.
- C. Provide available fault current calculations for hermetically sealed refrigeration compressors based on actual installation criteria (conductor lengths, raceway types, etc.). Include calculation information in Record Manuals.

- D. Owner, Architect, or Engineer will not be responsible for material delivered to jobsite prior to field coordination between trades.

3.2 INSTALLATION

- A. Kitchen equipment to be supplied and set in place by other trades, complete with all motors, heating elements and automatic controls. Provide and install wiring and electrical connections to kitchen equipment. Connect the panel or junction box of the prewired equipment.

3.3 EXHAUST HOODS

- A. Exhaust hoods to be supplied and set in place by other trades, complete with prewired lighting fixtures and dry chemical fire prevention system.
- B. Provide power, control, and alarm wiring as required.
- C. Activation of dry chemical fire prevention system:
 - 1. De-energize equipment below affected range hood.
 - 2. Activate separate FACP zone.

3.4 WALK-IN REFRIGERATION

- A. Refrigeration equipment to be supplied and set in place by other trades, complete with all motors, evaporators and automatic controls. Install all peripheral electrical accessories supplied with walk-in refrigeration equipment. Provide and install all circuitry and electrical connections to equipment as required. Connect the panel or junction box of the prewired equipment.
- B. Entire installation to comply with equipment submittal drawings.
- C. Maximum two ½" penetrations for walk-in cooler: lighting and evaporators. Condulet immediately exterior to room penetration. Pack sealing compound at penetration exterior around raceway circumference, and conduit interior after cables are pulled. At first interior junction box, pack sealing compound at penetration conduit entrance after wires are pulled.

END OF SECTION

**SECTION 26 6530
ELECTRIC HEATING EQUIPMENT****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Furnish and install all electric heating equipment as scheduled on Drawings.

1.2 SUBMITTALS**A. Shop Drawings**

1. Provide information in accordance with Section 260500.

B. Record Manuals

1. Provide information in accordance with Section 260500.

PART 2 – PRODUCTS**2.1 GENERAL**

- A. Size, wattage and control as scheduled.

PART 3 – EXECUTION**3.1 STORAGE**

- A. Store electric heating equipment in a cool, dry space prior to installation.

3.2 INSTALLATION

- A. Install in accordance with Code, product listing, and manufacturer's recommendations.
- B. Mount baseboard heaters above Architectural base.

END OF SECTION

SECTION 27 0500**DIVISION 27 GENERAL PROVISIONS****PART 1 – GENERAL****1.1 DESCRIPTION**

- A. The provisions and requirements of Section 260500 shall be applicable to Division 27.
- B. All Division 27 work shall be included under the Division 26 contract.
- C. The Contractor shall take special note that any conflicts between the Contractor and any Division 27 subcontractors shall not become an issue of the Engineer or Owner. It shall be the Contractor's responsibility to coordinate with the Division 27 subcontractor/s to determine where their work leaves off and where the subcontractor's work begins. The Contractor shall be responsible for all specified work including the operations of work under Division 27.

END OF SECTION

**SECTION 27 0528
NETWORK SYSTEMS ROUGH-IN****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide raceways for network systems as shown on the Drawings.

B. Work furnished and installed by others.

1. Local serving telephone utility shall place the service entrance cable to the point of presence, install circuit protection cabinet, protectors, and ground the entrance cable as needed to the service grounding conductor provided under this contract.

PART 2 – PRODUCTS**2.1 GENERAL**

- A. Main telephone terminal boards (TTB): 3/4" grade AD fire-resistant plywood, painted gray (including edges). Dimensions as required by serving utility company.

B. Voice/data terminal board (TTB):

1. 3/4" grade AD fire-resistant plywood, painted gray (including edges). Dimension as required by Owner's network system supplier. May be included with main telephone terminal board for single board installation.

C. Raceways:

1. As specified in Section 260533 and sized as shown on Drawings, minimum 3/4".

D. Boxes:

1. 2-1/8" deep unless restricted by wall thickness.
2. As specified in Section 260534 and 260540.

E. Blank plates:

1. As specified in Section 262726, yoke-mounted. Box-mounted plates not acceptable.

F. Firestop Assemblies

1. NRTL listed 4" square pathway with intumescent material designed to seal out fire, smoke, and toxic gases.
2. Quantity shall equal or exceed the width of the associated cable tray. i.e. a 6" wide tray requires two pathways.
3. Include mounting accessories as required by application specifics.
4. Manufacturer: EZ Path Series 44, 3M Model PT4SD or approved equal.

PART 3 – EXECUTION**3.1 INSTALLATION****A. Serving Communications Utility Requirements**

1. Raceways:
 - a. Provide telephone service entrance conduit, stubbed to terminal board from property line.
 - b. Verify service entrance conduit size and quantity, and property line location with serving utility.
 - c. Provide bushing or connector at each conduit stub.
 - d. Provide pull wire in each telephone conduit run.
2. Provide surface double-duplex receptacle at main telephone terminal board, fed from dedicated spare circuit breaker. Receptacles to be isolated ground type, with separate grounding conductor connected to panelboard grounding bar.
3. Provide telephone board communication grounding bus as required by serving utility, minimum #6 solid SDBC in conduit, extended shortest and most direct route to ground bar at main switch. Terminate in ground bar affixed to telephone terminal board, location as directed by serving utility.
4. Entire installation to comply with serving utility company requirements.

B. Raceways:

1. Stub from rough-in location into nearest accessible ceiling space, or location as indicated on Drawings.
2. Provide bushing or connector at each conduit stub.
3. Provide pull wire in each voice/data raceway.
4. Provide raceway system where concealed in walls, in mechanical rooms and rooms without accessible ceilings.

C. Provide blank plates for all rough-in boxes not concealed by Owner's voice/data equipment.**D. Entire installation to comply with Owner's network systems supplier requirements.****END OF SECTION**

**SECTION 27 1513
NETWORK CABLING****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Provide Network Cabling System as shown and described.

B. Work furnished and installed by others.

1. Voice: The Owner will provide all telephone handsets.
2. Data: The Owner will provide all end-user software, programming, computer servers, terminals and personal computers.
3. Surveillance: The surveillance system cameras, servers, switches and storage equipment will be provided and installed either by the Owner or under other Sections of this specification.

C. Description of System

1. Voice: Work shall include, but not be limited to, devices, faceplates, cables and cable assemblies, connecting blocks, cable management, terminations, and final acceptance testing.
2. Data: Work shall include, but not be limited to, devices, faceplates, cables and cable assemblies, cable management, patch panels, data racks, terminations, and testing.
3. Surveillance: Work shall include, but not be limited to, devices, cables and cable assemblies, cable management, patch panels, data racks, terminations, and testing.

1.2 SUBMITTALS**A. Shop Drawings**

1. Submit information in accordance with Section 260500.
2. Indicate:
 - a. Mounting details.
 - b. Connection diagrams.
 - c. Description of devices.
 - d. Name of installation Contractor/Subcontractor.

B. Record Manuals

1. Provide information in accordance with Section 260500.
2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

- A. The system specified is based on equipment as manufactured by General Cable, Panduit, Commscope and other manufacturers as listed. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met. Backboards, conduit, cable tray, and rough-ins shall be by Electrical Contractor.
- B. Contractors/Subcontractors performing Section 271500 work shall have personnel trained/certified in communications cabling installation via equipment manufacturers' or industry standards' training programs. Refer to Section 260500-1.5 Quality Assurance.
- C. Acceptable installers:
 - 1. Computer Store, 1100 S Broadway, Minot, ND 58701, 701/838-3967.
 - 2. Data Connections, 4016 37th Avenue NW, Mandan, ND 701/426-8771.
 - 3. Dell-Comm, Inc. 812 S 18th St., Bismarck, ND 58504, 701/222-2887.
 - 4. ECSI, 1711 12th Ave SW, Minot, ND 58701, 701/838-8401
 - 5. Gefroh Electric, 100 45th Ave NW, Minot, ND 58703, 701/838-0225.
 - 6. Innova Integrated Systems, 1800 22nd Ave SW, Minot, ND, 701/837-0131.
 - 7. Main Electric, 2626 Valley St., Minot, ND 58701, 701/852-3315.
 - 8. Muth Technology, 600 E Benson Rd, Sioux Falls, SD 57104, 800/888-1597.
 - 9. RBB Electric, 1123 N 1st St., Grand Forks, ND 58208, 701/775-7404.
 - 10. Wheeler Construction, 1720 South Broadway, Minot, ND, 58701, 701/852-5584.
 - 11. Installers not listed above and wishing to quote shall refer to Specification 260500-1.4 for approval procedure. No consideration shall be given to any installer not pre-approved.

2.2 DEVICES AND FACEPLATES

- A. Data jacks: Single outlet RJ45, eight-pin/eight wire, modular construction, TIA/EIA-568.2-D Category 6 compliant, T568A and T568B identification, Panduit Mini-Com #CJ688TG, Commscope #MGS400 series, Leviton #61UJK series, or approved equal.
- B. Voice jacks: Same as data jacks.
- C. Voice wall-mount face plate/jack assembly: Stainless steel with Category 6 keystone jack, Panduit #KWP6, Commscope #630B8, Leviton #4108W1SP series, or approved equal.
- D. Faceplates
 - 1. Single gang with ID windows and two or four modular inserts as dictated by jack count shown on the drawings.
 - 2. 430 or 302/304 stainless steel, or as selected by Architect.
 - a. Panduit #CFPL2/4 series, Commscope #M12/14SP-L series, Leviton #43080-1L2/4 series, or approved equal.
 - 3. Where plastic plates are selected by Architect.
 - a. Panduit #CFPE2/4 series, Commscope #M12/14L series, Leviton #42080-2/4 series, or approved equal.

- E. Provide blank modules as required. Panduit #CMB, Commscope #M81, Leviton #41084 series, or approved equal.
- F. Color: Devices as selected by Owner, faceplates as selected by Architect.
- G. Surveillance Cameras
 - 1. Jack assembly for cameras mounted to accessible ceilings shall utilize Panduit Model #CBXQ1IW-A enclosure mounted to building structure above the ceiling. Surveillance system provider shall be responsible for patchcord between camera and jack.
 - 2. Cameras mounted directly to rough-ins or surface boxes shall utilize cable terminated to RJ45 Plug, Panduit Model #FP6X88MTG field terminating type or approved equal. Provide minimum 12" extra cable length within rough-in or camera mounting equipment.

2.3 CABLES AND CABLE ASSEMBLIES

- A. Station cables (voice and data): Four unshielded, twisted pair, #23 gauge, Category 6 – 350 MHz, solid copper conductor, cable tray and plenum rated.
 - 1. General Cable #7131900, Commscope #2088B, Berk-Tek #10032094 or equivalent meeting the following characteristics at 250 MHz.
 - a. ACR: 10.5 dB min. @ 100m
 - b. PS-ACR: 8.5 dB min. @ 100m
 - c. ELFEXT: 24.5 dB min.
 - d. PS-ELFEXT: 21.5 dB min.
 - e. NEXT: 43 dB min.
 - f. PS-NEXT: 41 dB min.
 - g. ATTEN.: 32.8 dB max. @ 100m
 - h. LCL: 26 dB min.
 - i. Return Loss: 20 dB min.
- B. Outside Plant cable: Four unshielded, twisted pair, #23 gauge, Category 6, solid copper conductor, gel filled water block for underground/wet applications and UV resistant insulation.
 - 1. General Cable #7136100, Commscope #1572A, Berk-Tek #10139885 or equivalent meeting the following characteristics at 250MHz.
 - a. Insertion Loss: 32.8 dB max.
 - b. Return Loss : 17.3 dB min.
 - c. NEXT: 38.3 dB min.
 - d. PSNEXT: 36.3 dB min.

2.4 WIRELESS ACCESS POINT (WAP) CABLING

- A. Cabling for WAP's shall be Limited Power Listed CAT 6A.
 - 1. Data jacks: Single outlet RJ45, eight-pin/eight wire, modular construction, TIA/EIA-568.2-D Category 6A compliant, T568A and T568B identification, Panduit Mini-Com #CJ6X88TG, or approved equal.

2. Above Ceiling Installation: Panduit #CBXQ2IW-A, or Approved Equal surface termination box attached to building structure.
3. Station cables: Four unshielded, twisted pair, #23 gauge, Category 6A – 500 MHz, solid copper conductor, cable tray and plenum rated. UL Listed CMP-LP (0.7A).
 - a. General Cable #7151850 or Approved Equal meeting the following characteristics per 100 meters at 500 MHz.
 - 1) ACRF: 13.8 dB min.
 - 2) PSACRF: 10.8 dB min.
 - 3) PSAACRF: 32.0 dB min.
 - 4) NEXT: 33.8 dB min.
 - 5) PSNEXT: 31.8 dB min.
 - 6) PSANEXT: 60.0 dB min.
 - 7) Return Loss: 15.2 dB min.

2.5 MISCELLANEOUS PRODUCTS

A. Cable management:

1. 6" die-cast aluminum distribution rings: Allen Tel #GB13C or equivalent.
2. Plenum velcro cable ties: Panduit #HLSP series or equivalent.
3. Cable hooks with retainers: B-Line #BCH series or equivalent.

B. Patch Panels

1. Patch panels shall have modular jack-style termination connectors, be 24-port or 48-port in size, one or two standard EIA rack spaces in height. The panels shall have separate port and panel designation strips. Panduit #CP24BL or #CP48BL, Commscope #M2400-1U-GS, Leviton #49255-H24 or #49255-H48, or approved equal.
2. Quantity: As required by station cable count.

C. Data Rack (DTR)

1. 84", floor-mounted, EIA/TIA 19" rack assembly. Panduit #R2P, Hoffman #EDR19FM45U, Chatsworth #55053-X03, or equivalent, quantity as shown on Drawings.
2. Provide horizontal cable management panels with integral bend radius control for front and rear cables. Size and quantity determined by cable and patch panel quantity. Panduit #NCMH2, Hoffman #DCHD2, Chatsworth #13930-702, or equivalent.
3. Provide full height 4"x5" vertical cable management panels for front and rear cables. Panels required on both sides of rack. Panduit #WMPV45E, Hoffman #DV6D7, Chatsworth #13915-703, or equivalent.

D. Identification:

1. Panduit #LS8E or Pan-Mark labeling systems or equivalent. Hand lettering not acceptable.

E. Power Strip:

1. 19" rack-mounted surge suppression strip with twelve NEMA 5-20 receptacles.

2. UL1449 listed. 30kA Maximum Surge. EMI/RFI Filtration.
3. Manufacturer: CyberPower #CPS1220RMS or equivalent.
4. Quantity: One per data rack.

2.6 COLOR

- A. All cables shall match their associated jack color for type of system served unless otherwise indicated.
- B. Verify cable and jack color configuration with Engineer/Owner's Rep.
- C. Typical color configuration.
 1. Voice Jacks – Match Faceplate (Yellow cable)
 2. Data Jacks – Yellow
 3. WAP – Orange
 4. Cameras – Purple

PART 3 – EXECUTION

3.1 STORAGE

- A. Store system equipment in cool, dry space prior to installation.

3.2 GENERAL

- A. Securely install components where shown on Drawings.
- B. Contractor shall adjust and provide all other assistance required at final inspection to bring the system satisfactorily on-line.
- C. Install in accordance with NEC, EIA/TIA Standards, NRTL listing, and manufacturer's recommendations and instructions.
- D. All cables that extend underground shall be listed for use in wet locations. See Outside Plant cables in Part 2 for requirements.
- E. Cable:
 1. Install cables in raceways as required by Section 270528 and in cable tray (communications type) where cable tray is specified.
 2. Route open air cables (where not in raceway or cable tray) parallel or perpendicular to building construction supporting with specified products, maximum 4'-0" on center.
 3. Bundle multiple open air cable runs located in TTB/TB rooms together with velcro cable ties
 4. Identify ends of cables with room designations as directed by Owner.
 5. Bending radius shall be minimum 1".
 6. All cable runs shall be continuous, **NO SPLICING**.

3.3 DATA

- A. Provide Data Rack(s) as shown and specified.

- B. Install patch panels and cable management system in Data Rack.
- C. Install data station cable from patch panel to data outlet locations as shown on the Drawings. Cable length not to exceed 295 feet.
- D. Terminate cables according to T568A or T568B wiring scheme as determined by Owner's system requirements.
- E. Extended range cable to only be used where indicated on the Drawings, or where approved by the Engineer. Use of this cable is not permitted as an alternative to change or alter network system distribution locations or quantities.
- F. Identify cable at both ends according to Owner's convention. Arrange patch panels and patch panel jacks as per Owner's convention. Identify all patch panels, patch panel jacks, and faceplate jacks according to Owner's convention.
 - 1. If no convention is available, room numbers shall be incorporated into the identification. Ex: For room 120, use 120-1 for first cable, 120-2 for second cable, etc.

3.4 SURVEILLANCE

- A. Install separate dedicated patch panels in Data Rack for the camera cables.
- B. Install station cable from patch panel to camera locations as shown on the Drawings. Cable length not to exceed 295 feet. Verify exact camera location and mounting configuration with Surveillance System installer.
 - 1. Extended range cable to only be used where indicated on the Drawings or where approved by the Engineer.
- C. Terminate cables according to T568A or T568B wiring scheme as determined by Owner's system requirements.
- D. Identify cable at both ends according to Owner's convention. Arrange patch panels and patch panel jacks as per Owner's convention. Identify all patch panels, patch panel jacks, and faceplate jacks according to Owner's convention.
 - 1. If no convention is available, camera numbers shall be incorporated into the identification. Ex: For camera 21, use C-21.

3.5 GROUNDING

- A. For each data rack, provide one #10 AWG solid copper conductor from data rack to nearest panelboard with equipment ground bus.
- B. Where multiple data racks are located in single room (more than 2), provide isolated communication grounding bus in room. Extend #6 solid SDBC in conduit, extended shortest and most direct route to ground bar at nearest panelboard with equipment ground bus. Extend one #10 AWG solid copper conductor from each data rack to communication grounding bus in room.

3.6 TESTING REQUIREMENTS

- A. All terminated voice and data cables shall be tested and certified for TIA/EIA-568.2-D. Category 6 standards. The test shall be performed on the permanent link configuration (from station jack to patch panel jack). These standards require the following when tested at 250 MHz:
 - 1. Return Loss shall be no less than 10.0dB.
 - 2. Insertion Loss (Attenuation) shall not exceed 31.1dB.
 - 3. Near End Cross Talk (NEXT) shall be no less than 35.3dB.
 - 4. Power Sum Near End Cross Talk (PSNEXT) shall be no less than 32.7dB.
 - 5. Attenuation to Crosstalk Ratio Far-end (ACRF) shall be no less than 16.2dB.
 - 6. Power Sum ACRF (PSACRF) shall be no less than 13.2dB.
 - 7. Propagation Delay shall be less than 490 nanoseconds.
 - 8. Propagation Delay Skew shall be less than 44 nanoseconds.
- B. All terminated WAP cables shall be tested and certified for TIA/EIA-568.2-D. Category 6A standards. The test shall be performed on the permanent link configuration (from station jack to patch panel jack). These standards require the following when tested at 500 MHz:
 - 1. Return Loss shall be no less than 8.0dB.
 - 2. Insertion Loss (Attenuation) shall not exceed 43.8dB.
 - 3. Near-end Cross Talk (NEXT) shall be no less than 26.7dB.
 - 4. Power Sum Near-end Cross Talk (PSNEXT) shall be no less than 23.8dB.
 - 5. Attenuation to Crosstalk Ratio Far-end (ACRF) shall be no less than 10.2dB.
 - 6. Power Sum ACRF (PSACRF) shall be no less than 7.2 dB.
 - 7. Propagation Delay shall be less than 490 nanoseconds.
 - 8. Propagation Delay Skew shall be less than 44 nanoseconds.
 - 9. Power Sum Alien Near-end Cross Talk (PSANEXT) shall be no less than 49.5 dB.
 - 10. Power Sum Alien Attenuation to Crosstalk Ratio Far-end (PSAACRF) shall be no less than 23.7 dB.
- C. Additional testing shall include line mapping and cable length before final acceptance by Owner.
 - 1. DC resistance shall be less than 3% or less than 150 milli-Ohms.
- D. All permanent link cable runs shall be documented with a hard copy print-out of the test results. Compile one copy of test results in a loose-leaf binder, similar to manual references in Section 260500, 1.04E. Submit at project completion with referenced Record Manual.
- E. Field tester to be Level III and conform to TIA/EIA 568.2-D Annex A & B requirements.

3.7 CLEANING

- A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 28 0500**DIVISION 28 GENERAL PROVISIONS****PART 1 – GENERAL****1.1 DESCRIPTION**

- A. The provisions and requirements of Section 260500 shall be applicable to Division 28.
- B. All Division 28 work shall be included under the Division 26 contract.
- C. The Contractor shall take special note that any conflicts between the Contractor and any Division 28 subcontractors shall not become an issue of the Engineer or Owner. It shall be the Contractor's responsibility to coordinate with the Division 28 subcontractor/s to determine where their work leaves off and where the subcontractor's work begins. The Contractor shall be responsible for all specified work including the operations of work under Division 28.

END OF SECTION

**SECTION 28 4611
FIRE ALARM AND DETECTION****PART 1 – GENERAL****1.1 DESCRIPTION****A. Work Included**

1. Furnish and install a complete addressable fire alarm and detection system in accordance with NFPA 72 and this specification.

B. Work not included

1. Where required, the Owner shall be responsible for:
 - a. Line lease or service fees associated with signal transmission (alarm, supervisor, and trouble) to a remote central station.
 - b. Any proprietary interface equipment not specified herein and required by the Owner's monitoring service.

C. Description of System

1. General: Provide a complete, non-coded, addressable, microprocessor-based fire alarm system with initiating devices, notification appliances, and monitoring and control devices as indicated on the Drawings and as specified herein.
2. Software: The fire alarm system shall allow for loading and editing instructions and operating sequences as necessary. The system shall be capable of on site programming to accommodate system expansion and facilitate changes in operation. All software shall be stored in a non-volatile programmable memory within the fire alarm control panel (FACP). Loss of primary and secondary power shall not erase the instruction stored in memory.
3. History Logs: The system shall provide a means to recall alarms and trouble conditions in chronological order for the purpose of recreating an event history. Separate alarm, supervisory and trouble logs shall be provided.
4. Wiring/Signal Transmission
 - a. Transmission shall be addressable signal transmission, dedicated to fire alarm service only.
 - b. Circuit Supervision: Circuit faults shall be indicated by a trouble signal at the fire alarm control panel. Provide a distinctive indicating audible tone and alphanumeric annunciation.
 - c. System connections for initiating, signaling line circuits and notification appliance circuits shall be Class A or Class B as described in Part 3 of this specification.
5. Analog Smoke Detectors
 - a. Monitoring: The FACP shall individually monitor detectors for calibration, sensitivity, and alarm condition, and shall individually adjust for sensitivity. The FACP shall determine the condition of each detector by comparing the detector value to the stored values.
 - b. Environmental Compensation: The FACP shall maintain a moving average of the detector's smoke chamber value to automatically compensate for dust, dirt, and other conditions that could affect detection operations.

- c. Programmable Sensitivity: Smoke detectors shall have multiple sensitivity levels, programmed and monitored from the FACP.
 - d. The FACP shall automatically indicate when an individual detector needs cleaning.
 - e. The FACP shall continuously perform an automatic self-test on each detector, which will check detector electronics and ensure the accuracy of the values being transmitted. Any detector that fails this test shall indicate a trouble condition.
6. Analog Heat Detectors
- a. Monitoring: The FACP shall individually monitor detectors for alarm condition and shall individually adjust for fixed temperature sensing and rate-of-rise sensing. The FACP shall determine the condition of each detector by comparing the detector value to the stored values.
 - b. Programmable Sensitivity: Heat detectors shall have rate-of-rise temperature detection values selectable at the FACP for either 15° F or 20° F per minute. Fixed temperature sensing is independent of rate-of-rise sensing and shall operate at either 135° F or 155° F.
 - c. The FACP shall continuously perform an automatic self-test on each detector, which will check detector electronics and ensure the accuracy of the values being transmitted. Any detector that fails this test shall indicate a trouble condition.
7. Power Requirements
- a. The FACP and each required expansion panel shall receive 120-volt AC power via a dedicated 20-ampere circuit breaker from the nearest panelboard. The incoming power to each panel shall be supervised so that any power failure will be indicated at the FACP and sound a trouble signal. The primary power branch circuit supplying fire alarm equipment shall supply no other loads. The circuit breaker:
 - 1) Location shall be permanently identified at the corresponding control unit.
 - 2) Shall have a listed circuit breaker locking device installed.
 - 3) Shall have a red marking which shall not damage the overcurrent protective device or obscure the manufacturer's markings.
 - 4) Shall be permanently identified as to its purpose: "FIRE ALARM" for fire alarm systems, "EMERGENCY COMMUNICATIONS" for emergency communications systems, and "FIRE ALARM/ECS" for combination fire alarm and emergency communications systems.
 - b. The FACP shall be provided with sufficient battery capacity to operate the entire system upon loss of normal AC power in a normal supervisory mode for a period of 24 hours with 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to battery standby upon power failure. All battery charging and recharging operations shall be automatic. System batteries shall be supervised so that a low battery condition or disconnection of the battery shall be indicated at the control panel.
 - c. All circuits requiring system-operating power shall be 24-volt DC and shall be individually fused at the control panel.
 - d. The system shall support 100% of the addressable devices in alarm operation at the same time, under both primary (AC) and secondary (battery) power conditions.
8. Fire Sprinkler Monitoring
- a. Water Flow: Activation of a water flow switch shall initiate a general alarm operation.
 - b. Valve Supervisory Switch (Tamper Switch): The activation of any valve supervisory switch shall activate system supervisory operations.
 - c. Activation of either a water flow switch or valve supervisory switch shall distinctly report which device is in alarm at the FACP and any required remote annunciator(s).

1.2 REQUIRED SYSTEM FUNCTIONS

- A. **Priority of Signals:** Alarm events have the highest priority. Subsequent alarm events are queued in the order received and do not affect existing alarm conditions. Supervisory and Trouble events have second-level and third-level priority respectively. Events of a higher-level priority take precedence over events of lower priority even though the lower-priority condition occurred first. Annunciate all events regardless of priority or order received.
- B. **Non-interfering:** The activation of an addressable device does not prevent receipt of signals from subsequent activations.
- C. **Transmission to Remote Central Station:** The FACP shall have the capability to automatically route alarm, supervisory, and trouble signals to a central station via Internet Protocol (IP) over the public open Internet.
- D. **Types of Signaling:** The FACP shall be NRTL-listed for the applicable types of signaling methods used, i.e.: Temporal Coded, Non-Coded, March Time and/or Internet Protocol.
- E. **Annunciation:** Operation of alarm and supervisory initiating devices shall be annunciated at the FACP and any required remote annunciator(s), indicating the location and type of device.
- F. **General Alarm:** Activation of an alarm initiating device shall include:
 - 1. Indication of alarm condition at the FACP and any required remote annunciator(s).
 - 2. Identification of the device that is the source of the alarm at the FACP and any required remote annunciator(s).
 - 3. Operation of all audible and visual notification appliances throughout the building until silenced at the FACP and any required remote annunciator(s). Audible alarm notification shall operate steady or match existing building convention.
 - 4. Shutting down designated air handling equipment, and activating smoke dampers and exhaust fans as required by alarm input.
 - 5. Have the capability to automatically route the signal to a Remote Central Station.
 - 6. The control panel shall be capable of bypassing Items 4 and 5 through the use of programmable touch pads on the front of the control panel. These touch pads shall be password-protected to prevent unauthorized tampering.
 - 7. Record the event in the FACP historical log.
 - 8. Closing doors normally held open by magnetic door holders.
 - 9. Initiate elevator recall in accordance with ASME/ANSI A17.1, when designated fire alarm detectors are activated.
 - 10. Initiation of smoke control sequence.
 - 11. Unlocking of designated doors.
- G. **Supervisory Operations:** Upon activation of a supervisory device such as fire pump failure, low air pressure switch, and tamper switch, the system shall operate as follows:
 - 1. Activate the system supervisory service audible signal and illuminate the LED at the FACP and any required remote annunciator(s).
 - 2. Pressing the Supervisory Acknowledge key will silence the supervisory audible signal while maintaining the supervisory LED "on" indicating off-normal condition.
 - 3. Record the event in the FACP historical log.
 - 4. Transmission of supervisory signal to Remote Central Station.

- H. Alarm Silencing: If the “Alarm Silence” button is pressed, all audible alarm signals shall cease. (Visual signals shall continue to operate.)
- I. System Reset:
 - 1. The “System Reset” button shall be used to return the system to its normal state. Display messages shall provide the operator assurance of the sequential steps (“IN PROGRESS”, “RESET COMPLETED”) as they occur. The system shall verify all circuits or devices are restored prior to resetting the system to avoid the potential for re-arming the system. The display message shall indicate, “ALARM PRESENT, SYSTEM RESET ABORTED.”
 - 2. Should an alarm condition continue, the system will remain in an alarmed state.
- J. Drill: A manual activation (drill) switch shall be provided to initiate an alarm on the FACP.
- K. Manual Control: Manual controls shall be supervised so that an “off normal” position of any switch shall cause an “off normal” system trouble. The “off normal” status shall be clearly identified in plain language on the FACP alphanumeric display.
 - 1. Manual Bypass Control: The ability to perform a manual bypass of selected automatic functions shall be provided.
 - 2. Circuit Enable/Disable Control: The system shall have provisions for disabling and enabling each circuit individually for maintenance or testing purposes.
- L. WalkTest: The system shall be capable of being tested by one person without returning to the control panel to reset the system after each alarm. Enabling the one-person test feature at the FACP shall activate the “One person Testing” mode of the system as follows:
 - 1. The control panel shall automatically log each alarm and each trouble condition tested, and reset the system for the next condition to be received. Should the walktest feature be left off for a preprogrammed length of time without any activity, the system shall revert to the normal operating mode automatically.
 - 2. The city circuit connection and suppression release circuits shall be bypassed for the testing group.
 - 3. Control relay functions associated to the testing group shall be bypassed.
 - 4. The FACP shall indicate a trouble condition.
 - 5. The alarm activation of any initiating device in the testing group shall cause the audible notification appliances to sound a code to identify the device.
 - 6. The control panel shall automatically reset itself after signaling is complete.
 - 7. Any momentary opening of an initiating or notification appliance circuit wiring shall cause the audible signals to sound for 4 seconds indicating the trouble condition.

1.3 SUBMITTALS

- A. Shop Drawings
 - 1. Submit information in accordance with Section 260500.
 - 2. Indicate:
 - a. Mounting details.
 - b. Cabinet dimensions.
 - c. Wiring diagrams.

- d. Description of devices.
- e. Floor plan layout of fire alarm system indicating location of devices, wiring between devices, and intensities of audible and visual appliances. Upon request, the Engineer will furnish AutoCAD files of the floor plan. Submit one copy to Engineer for approval. Upon receipt of Engineer's approval, provide **additional four** copies. Submit one copy to Engineer. Remaining copies for Contractor use at the project site and for Record Drawing/Manual submittal at project closeout (redlined to indicate actual conditions of installation).

B. Record Manuals

1. Provide information in accordance with Section 260500.
2. Include complete data for operation and maintenance of the system, consisting of:
 - a. Wiring diagrams.
 - b. Testing.
 - c. Maintenance.
 - d. Description of system operation.
 - e. Addition of devices.
 - f. Frequency of testing procedures.
 - g. All data referenced in NFPA 72, 7.5.
3. Provide multiple copies (including shop drawing connection/riser diagram), one to remain in control panel, other copies for Record Manuals.

1.4 MANUFACTURER/SUPPLIER

- A. The system specified is based on equipment as manufactured by Johnson Controls Fire Protection: Autocall or Simplex. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance, which must be met.
- B. Other acceptable manufacturers: Edwards Systems Technology, Potter Electric Signal, or Siemens Fire Safety.
 1. Being listed as an acceptable manufacturer in no way relieves obligation to provide all equipment and features in accordance with this specification.
- C. All equipment shall be NRTL-listed, and shall be furnished by one manufacturer to ensure listing/equipment compatibility as required by NFPA 72.
- D. Supplier providing equipment and services under this Section shall have:
 1. A factory-authorized service center located in North Dakota within 250 miles of the project site. Referenced service center shall be under direct control of the Supplier, staffed by employees of the Supplier, and contain an inventory of replacement material requisite for timely maintenance. Referenced service center shall be operational for a minimum five-year period or have equivalent five-year industry experience with installation and programming prior to bid opening.
 2. A minimum of one employee at the above referenced service center certified by National Institute for Certification in Engineering Technologies (NICET). Certification shall be in the Fire Protection Engineering Technology field, Fire Alarm Systems sub-field, and shall be minimum Level III.

E. Acceptable Suppliers:

1. ACS, 3410 13th St NE, Minot, ND (701) 446-8840.
2. Electro Watchman, Inc., 4715 19th St SE, Mandan, ND (701) 258-6169.
3. Forte, 1502 Gruman Lane, Bismarck, North Dakota, (701) 963-4693.
4. Nardini Fire Equipment Co. Inc., 303 20th St N, Fargo, ND (800) 950-1139.
5. NewVison, 3320 Hamilton St. Unit 5, Bismarck, ND 58503 (701) 222-8888.
6. SimplexGrinnell, 2821 Fiechtner Drive, Fargo, ND (800) 342-4668.
7. Systems Technology, 1424 44th St N, Fargo, ND 58102 (701) 235-0558.

PART 2 – PRODUCTS**2.1 CENTRAL SYSTEM**

A. Fire Alarm Control Panel (FACP)

1. General: Comply with UL 864, “Control Panels for Fire-Protective Signaling Systems.”
2. Cabinet:
 - a. Steel enclosure with lockable, hinged door for front access. Surface or flush-mount style as indicated on the Drawings.
 - b. Color: Red when surface-mounted in equipment rooms, and beige, black or gray when flush-mounted in other locations.
3. The following FACP hardware shall be provided:
 - a. Power limited base panel with 120-volt AC input power.
 - b. Addressable point capacity: Size for requirements of Drawings and Specifications, minimum of 100 points expandable to 250 points, inclusive of inputs and outputs in any combination (Autocall #4007ES series).
 - c. Supports live and pre-recorded voice communication.
 - d. Appropriate initiating device circuit (IDC) and notification appliance circuit (NAC) modules to support Class A or Class B circuits as described in Part 3 of this specification
 - e. Alphanumeric Display and System Controls: FACP shall include an 80 character LCD display to indicate alarm, supervisory, and component status messages and shall include a keypad for use in entering and executing control commands.
 - f. Notification appliance circuits: Size for requirements of Drawings and Specifications, minimum of 4 required.
 - g. Two form “C” auxiliary output circuits (rated 2A @ 24-volt DC, resistive), operation is programmable for trouble, alarm, supervisory or other selective control operations. Provide capability for switching up to 1/2 A @ 120-volt AC, inductive loads.
 - h. Secondary (emergency) power supply including: battery(s), charger and automatic transfer switch. Battery(s) shall be sealed lead-acid type.
 - i. An IP communicator to automatically route the alarm signals to a Remote Central Station.
 - 1) Designed to monitor the status of the FACP and report to a Remote Central Station as follows:
 - a) Alarms.
 - b) Troubles.
 - c) Supervisory conditions.
 - 2) The transmission path shall be supervised at an interval of 60 minutes or less.
 - 3) Module Types:

- a) Direct connect IP communication module.
- b) IP dialer capture module to convert Digital Alarm Communicator information to IP protocol.
- c) Digital Cellular module.
- j. Supervised serial communication circuit for control and monitoring of remotely located LCD annunciator(s) and I/O panels.

B. Alarm Initiating Devices

1. Manual fire alarm station:
 - a. "Address capable"
 - b. Non-coded single action.
 - c. Provide two spare stations.
2. Automatic area smoke detection station:
 - a. "Address" capable.
 - b. Combination photoelectric smoke and fixed heat plug-in "head" unit which mounts to a twist-lock base.
 - c. Individual station sensitivity levels are selected and monitored at the control panel.
 - d. Self-restoring.
 - e. White or Black color.
 - 1) Verify color for each area/room with architect and engineer.
 - f. Comply with UL 268.
 - g. Provide three spare stations.
3. Automatic duct smoke detection station:
 - a. "Address" capable.
 - b. Automatic photoelectric smoke detection station with associated duct housing and sampling tubes as required.
 - c. Refer to Motor and Equipment Schedule for equipment requiring duct detection.
4. Automatic area heat detection station:
 - a. "Address" capable.
 - b. Combination rate-of-rise and fixed temperature rate compensated sensing plug-in "head" unit, which mounts to a twist-lock base.
 - c. Individual station rate-of-rise temperature levels are selected and monitored at the control panel. Fixed temperature level is independent of rate-of-rise levels and shall operate at 135° F or 155° F. Select appropriate mode.
 - d. Locations requiring temperature ratings exceeding 155° F may include hardwired detector on an addressable base.
 - e. Self-restoring.
 - f. Low profile.
 - g. White or Black color.
 - 1) Verify color for each area/room with architect and engineer.
 - h. Provide two spare stations of each rating.
5. Automatic Carbon Monoxide (CO) detection station:
 - a. "Address" capable.
 - b. Combination photoelectric smoke and carbon monoxide detector plug-in "head" unit which mounts to a twist-lock base.
 - c. Self-restoring.
 - d. Low profile.
 - e. White or Black color.
 - 1) Verify color for each area/room with architect and engineer.
 - f. Comply with UL 2075 and 268.

- g. Provide one spare CO station.

C. Alarm Notification Appliances

1. Audible alarm notification appliance
 - a. Piezoelectric type horn.
 - b. Flush mount.
 - c. Red or White finish.
 - 1) Verify color for each area/room with architect and engineer.
 - d. Comply with UL 464.
 - e. Class A operation.
2. Visual alarm notification appliance
 - a. Xenon or LED flash tube and associated lens/reflector system.
 - b. Comply with Americans With Disabilities Act (ADA).
 - c. Minimum of four (4) field selectable strobe intensity settings: 15, 30, 75 and 110 candela. All settings shall be UL 1971 listed for both wall and ceiling mount applications. Select strobe intensity for each unit as dictated by location and NFPA 72, 18.5.
 - d. "Fire" lettering on housing or lens.
 - e. Red or White finish.
 - 1) Verify color for each area/room with architect and engineer.
 - f. Comply with UL 1971.
 - g. Class A operation.
3. Where shown ganged together on Plans, combine audible and visual alarm notification appliances into one device.
4. Manufacturer: Same as control panel.

D. Auxiliary Devices

1. Magnetic door holder:
 - a. 24 volt or match existing.
 - b. Extra low profile for use with concealed wiring.
2. Individual addressable module (IAM):
 - a. Module provides supervised, location specific addressability, to a single initiating device by monitoring normally open, dry contacts. Closure of contacts initiates an alarm or trouble signal as required by the device being monitored.
 - b. Used to provide addressable monitoring of devices such as flow or tamper switches, etc.
 - c. Powered directly from signaling line circuit. No separate power source required.
 - d. Mount in single-gang box, minimum 2-1/2" deep.
 - e. Included with flush or surface cover as required.
 - f. Provide a separate IAM for each device being monitored.
3. Individual addressable relay module (Relay IAM):
 - a. Module provides control and status tracking of a Form "C" SPDT, dry contact.
 - b. Module power and communications provided directly from the signaling line circuit.
 - c. Used to provide addressable control functions such as elevator recall, HVAC control, fan control, damper control, etc.
 - d. Mount in standard 4" square box.
 - e. Included with flush or surface cover as required.

E. Manual Shutdown

1. Manual shutdown capability included with motor starter.

F. Automatic Shutdown

1. Automatic shutdown capability for air handling equipment where required by NFPA 90A.
2. Locate fan shutdown relays remote from fire alarm control panel, controlled by integral relay in fire alarm control panel, with bypass switch.
3. Refer to Motor and Equipment Schedule for equipment requiring automatic shutdown.
4. Wiring: Two-wire parallel independent circuit to fire alarm control panel.

G. Remote Annunciator

1. Alphanumeric LCD display with the same “look and feel” as the FACP operator interface.
2. Status LED’s provide system status in addition to LCD display information. Status LEDs included for:
 - a. Alarm.
 - b. System trouble
 - c. System supervisory.
 - d. Alarm silenced.
 - e. Power on.
3. Should an abnormal condition be detected the appropriate LED shall flash. The unit audible signal shall pulse for alarm conditions and sound steady for trouble and supervisory conditions. When acknowledged, the LED shall remain on until reset.
4. Captive key switch enables following push buttons:
 - a. Alarm acknowledge.
 - b. Trouble acknowledge.
 - c. Alarm silence.
 - d. System reset.
 - e. Supervisory acknowledge
5. Touchscreen type remote annunciator incorporating the same functionality as listed shall be acceptable.

H. Kitchen Exhaust Hood Extinguishing System

1. Interface the kitchen exhaust hood extinguishing system with fire alarm system such that activation of the extinguishing system will activate the fire alarm notification appliances.
2. Provide fire alarm Relay IAM(s) and/or fan relay as required by extinguishing system electrical characteristics.

I. Fire Sprinkler System Equipment

1. Flow switch(es) and valve supervisory switches furnished and installed by Fire Sprinkler Contractor, wired by Electrical Contractor.
2. Fire sprinkler alarm notification appliance (bell or audible-visual signaling unit) furnished by Fire Sprinkler Contractor, installed and wired by Electrical Contractor.

PART 3 – EXECUTION

3.1 STORAGE

- A. Store fire alarm components in a cool, dry area prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with code, product listing, and manufacturer's recommendations.
2. Wiring to comply with all national, state and local fire codes.
3. All fire alarm circuitry shall be installed in raceway unless otherwise noted. Refer to Section 260533 for acceptable raceways.
4. Conductors:
 - a. Quantity as required by manufacturer.
 - b. Signaling Line Circuits (SLC):
 - 1) Two-conductor #18 AWG, twisted pair shielded or unshielded cable as per manufacturer requirements.
 - 2) NFPA 72 Class A, "T" tapping not permitted (exceptions as per NFPA 72, 12.3.8.1 acceptable).
 - c. Alarm notification appliance circuits (NAC):
 - 1) Solid, #14 AWG minimum, size for maximum 5% voltage drop.
 - 2) NFPA 72 Class A, "T" tapping not permitted (exceptions as per NFPA 72, 12.3.8.1 acceptable).
 - 3) Audible appliances (horns) controlled separately from visual appliances.
 - 4) All visual appliances shall flash in synchronization.
 - d. Miscellaneous Circuits: (such as magnetic door holders & etc.)
 - 1) Solid, #14 AWG minimum, size for maximum 5% voltage drop.
 - e. Color Coding: Manufacturer/Supplier requirements.
 - f. Enclosed in raceway system (i.e. conduit).
 - g. To ensure proper supervision of initiating and indicating circuitry, three wires maximum per wire-nut.
5. Raceway Systems:
 - a. Size raceway systems and junction boxes as per NEC.
 - b. All raceway systems shall be externally identified by permanent RED paint suitable for the purpose to easily distinguish from other electrical raceway systems. Items shall be painted prior to installation. In addition to field painted conduit, factory painted conduit as manufactured by Allied Tube & Conduit or equivalent is acceptable.
 - 1) Exceptions: Raceway color coding shall not apply to the following areas:
 - a) Raceway systems embedded directly in earth or concrete.
 - b) Surface mounted raceways systems in finished spaces where all raceways are to be painted to match adjacent surfaces.
 - c) Surface metal raceway systems such as Wiremold type raceways.
 - c. Route outgoing and return Class A circuits in separate conduits (exceptions as per NFPA 72, 12.3.8.1 acceptable).
 - d. Multiple circuits acceptable in same raceway system.
6. Terminations:
 - a. Connect all devices according to manufacturer's data.
 - b. Made on terminal strips with separate joint for each conductor.

- c. Number identify all strips as shown in wiring diagram included with manual.
- d. Number identify all conductors to agree with terminal strip numbering.
- e. When required, end of line devices to be mounted on terminal strips in the FACP.
- f. Wire-nut terminating not acceptable.
7. Do not zone alarm notification appliances. Rather, route notification appliance circuits (NAC's) with signaling line circuits (SLC's). Terminate and jumper as required to maintain supervision on identified terminal strips.
8. Locate devices as generally shown on Drawings and as specifically indicated on installation instructions.
9. Remote fan shut-down relays to be mounted near controller or equipment.
10. Where control panel is shown to be surface-mounted, provide 3/4" grade AD, fire-resistant, gray painted (including edges), plywood backing.
11. Provide 1/2" conduit from fire alarm control panel to nearest network rack offering internet access. Provide a four-pair minimum Category 5e UTP data cable terminated to the IP communicator module. Ensure owner's internet access equipment complies with secondary power requirements as required by NFPA 72. If owner provided internet access is not available, provide additional dedicated IP equipment as required to obtain internet service in conformance with NFPA 72.
12. Provide elevator/fire alarm interface as per Section 262822.

B. Spot-Type Detectors

1. Locate as generally shown on Drawings and as specifically indicated in NFPA 72 and on installation instructions.
 - a. All detectors in rooms with gas fired equipment shall include CO sensor.
2. Provide protective plastic wrapping to prevent entrance of construction dust. Field-install during construction. Remove immediately prior to supplier testing. Replace protective plastic wrapping and remove day of final inspection.
3. All smoke/heat detection devices shall be located a minimum of 3' from any supply, return, or exhaust air diffusers/grills.

C. Duct Detectors

1. Installed and arranged to automatically initiate general alarm.
2. Provide at a suitable location in the return air stream prior to exhausting from building or being diluted by outside air.
3. Provide at a suitable location in main supply duct on downstream side of filters.
4. Refer to Motor and Equipment Schedule for equipment requiring duct detection.
5. Locate as specifically indicated in NFPA 72 and on installation instructions. Coordinate with supplier's representative prior to installation, exact location to ensure accurate sampling of air stream. Provide quantity as required by duct geometry.
6. Do not install head on sampling tube base in housing until final supplier testing, unless a protective cover is included with the detector head.

D. Remote Annunciator

1. Flush mounting.
2. Gangable switch box as required.
3. Minimum two #14 AWG conductors and one #18 AWG twisted shielded pair, or as required by manufacturer.

E. Fire Sprinkler System Equipment

1. See Mechanical Drawings and Specifications for locations and quantities.
2. Valve supervisory switches:
 - a. Integral contact shall serve as supervisory initiating device for separate "Address".
 - b. Supervisory only. Will not sound general alarm, or "Trouble".
3. Flow Switch:
 - a. Consists of two Form "C" (NO-NC) contacts.
 - b. One contact shall serve as alarm initiating device for separate "address".
 - c. Second contact shall control fire sprinkler alarm notification appliance. Connect to nearest 120 volt egress circuit. Provide transformer and relay as required.

3.3 TESTS

- A. Prior to final inspection, verify that the fire alarm system is in proper working condition, free from false alarms. Furnish a letter of verification to Engineer indicating that the system has been tested by manufacturer's representative and is found to be complete and functional. List date of test and name of manufacturer's representative. Indicate in letter that testing was in accordance with NFPA 72, Chapter 14, including re-acceptance testing when applicable. Include copies in control panel and Record Manuals.
- B. Notify Owner, Engineer, and Local Fire Marshall or Fire Chief one week in advance of scheduled tests. Electrical Contractor responsible for test coordination and scheduling.

3.4 INSTRUCTIONS

- A. Manufacturer's representative shall instruct Owner in proper operation, maintenance and testing of complete fire alarm and detection system. Indicate on letter of verification, name of Owner's representative receiving instructions.
- B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

- A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.
- B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION