

# Specification Manual For:

**MID-COAST SCHOOL OF TECHNOLOGY – REGION 8  
ROCKLAND, MAINE**

**Bid Specifications – VOLUME 1**

**Project 14-019-00  
19 June 2017**

**LAVALLEE | BRENSINGER ARCHITECTS**  
Boston | Manchester | Portland  
[www.LBPA.com](http://www.LBPA.com)

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## **PROJECT DIRECTORY**

### **OWNER**

#### **Mid-Coast School of Technology – Region 8**

1 Main Street, Rockland, Maine 04841

### **ARCHITECT**

#### **Lavallee Brensinger Architects (LBA)**

305 Commercial Street, Portland, Maine 04101

Contact: Ron Lamarre, Design Principal

Telephone: 603-622-5450 E-mail: ron.lamarre@lbpa.com

### **CIVIL ENGINEER**

#### **Gartley & Dorsky Engineering and Surveying, Inc.**

59 Union Street, Unit 1 - PO Box 1031, Camden, Maine 04843

Telephone: 207-236-4365

### **GEOTECHNICAL ENGINEERING**

#### **Summit Geoengineering Services, Inc.**

173 Pleasant Street, Rockland, Maine 04841

Telephone: 207-318-7761

### **STRUCTURAL ENGINEER**

#### **Becker Structural Engineers, Inc.**

75 York Street, Portland, Maine 04101

Telephone: 207-879-1838

### **MECHANICAL, ELECTRICAL, FIRE PROTECTION, ENGINEERS**

#### **Allied Engineering Inc**

160 Veranda Street, Portland, Maine 04103

Telephone: 207-221-2260

### **FOOD SERVICE CONSULTANT**

#### **TJM Consulting, Inc.**

273 Main Street, Suite 5, Yarmouth, Maine 04096

Telephone: 207-215-4736

### **ACOUSTIC CONSULTANT**

#### **Cavanaugh Tocci, Inc.**

327F Boston Post Road, Sudbury, Massachusetts 01776

Telephone: 978-443-7871

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Geotechnical Report: "Mid-Coast School of Technology, 1 Main Street, Rockland, Maine",  
Dated February 10, 2017.  
Geothermal Test Well Report

**SECTION 00 21 13  
INSTRUCTIONS TO BIDDERS**

**INVITATION**

**1.01 BID SUBMISSION**

- A. Bids signed and under seal, executed, and dated will be received at a location **To Be Determined**, before 2:00 p.m. local standard time on August 03, 2017. Bids will be opened and publically read immediately after 2:00pm on August 03, 2017.
- B. Offers submitted after the above time shall be returned to the Bidder unopened.
- C. Pre-qualified General Contractors:  
The District has pre-qualified the following General Contractors to participate in the bidding of the Project:

**PC Construction**  
**131 Presumpscot Street**  
**Portland ME 04103**  
**207-874-2323**

**The Sheridan Corporation**  
**739 Warren Avenue**  
**Portland ME 04103**  
**207-774-6183**  
and / or  
**33 Sheridan Drive**  
**Fairfield ME 04937**  
**207-453-9311**

**1.02 INTENT**

- A. The intent of this Bid request is to obtain an offer to perform work to construct Mid-Coast School of Technology – Region 8 and demolition of existing school structure and site built structures in Rockland, Maine, in accordance with the Contract Documents.

**1.03 CONTRACT TIME**

- A. Perform the Work within the time stated in Section 01 00 00 - General Requirements.

**BID DOCUMENTS AND CONTRACT DOCUMENTS**

**2.01 DEFINITIONS**

- A. Bid Set Documents: Contract Documents supplemented with Instructions to Bidders, Bid Form, Supplements To Bid Forms identified.
- B. Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.
- C. Addenda are written or graphic instruments, issued by the Architect to Bidders through the printing company prior to the execution of the Contract. They modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.
- D. Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or deducted for sums stated in Alternate Bids.

- E. Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in Work, as described in the Bidding Documents, is accepted.
- F. Unit Price is an amount stated in the Bid as a possible price per unit of measurement for materials, equipment, services or a portion of the Work as described in Bidding Document. The choice of using Unit Prices or an alternative method of payment, for additional Work shall be left solely to the Owner's discretion.

## 2.02 BIDDER'S REPRESENTATION

- A. Each Bidder by making his Bid represents that he has read and understands the Bidding Documents, that he agrees that the Bidding Documents are adequate to produce the required results, and that his Bid is in accordance therewith.
- B. Each Bidder by making his Bid represents that he has visited and thoroughly inspected the existing building and site, and familiarized himself with the local conditions under which the Work will be performed. Bidders are encouraged to make any and all inspections as they feel necessary to achieve such familiarization prior to submitting Bids. Such inspections shall be conducted at times acceptable to the Owner.
- C. The submission of a Bid will be construed as conclusive evidence that the Bidder has made all such examinations and inspections necessary for a complete and proper assessment of the Work required, and that the Bidder has included in his Bid a sum sufficient to cover the cost of all items necessary to perform the Work as set forth in the Contract Documents. No allowance will be made to a Bidder because of lack of such examination, inspection or knowledge.
- D. Each Bidder by making his Bid represents that he has assessed the conditions of the current construction marketplace, and verified that an adequate, experienced workforce is available to suitably man the Work of this Project, and complete it in a timely fashion.
- E. Each Bidder is assumed to have made himself familiar with all Federal, State and Local laws, ordinances and regulations which in any manner affect those engaged in or upon the Work, or in any way affect those engaged or employed in the Work of the materials or equipment used in or upon the Work, or in any way affect the conduct of the Work. All taxes and assessments as levied by Federal, State and Local laws shall be applicable to this Contract.
- F. Each Bidder acknowledges that this public school project is not subject to Maine State Sales Tax for all materials permanently constructed into the project. This tax exemption does not apply to consumable supplies, tools, or machinery that does not remain in place at the project completion. Owner will provide tax ID information to the successful bidder. See Contractor's Exempt Purchase Certificate.

For more information go to: <http://www.state.me.us/revenue/salesuse/Bull4123112.pdf>

## 2.03 AVAILABILITY

- A. Bid documents may be obtained from the Pre-qualified General Contractors, using the following contact information:

**PC Construction**  
**131 Presumpscot Street**  
**Portland ME 04103**  
**207-874-2323**

**The Sheridan Corporation**  
**739 Warren Avenue**  
**Portland ME 04103**  
**207-774-6183**  
and / or  
**33 Sheridan Drive**  
**Fairfield ME 04937**  
**207-453-9311**

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

#### 2.04 EXAMINATION

- A. Each Bidder shall examine the Bidding Documents carefully.
- B. Bidders are encouraged to direct any questions which may arise to the Architect, in order to provide necessary clarifications prior to the commencement of the Work.
- C. Bid Documents are on display at the following location:
  - 1. **Lavallee Brensinger Architects**  
**305 Commercial Street**  
**Portland, Maine 04101**
  - 2. Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.
  - 3. Immediately notify Architect upon finding ambiguity, discrepancies or omissions in the Bid Documents, or the site and local conditions. Should Bidders fail to notify the Architect of discrepancies or contradictions in the Bidding Documents, they shall be assumed to have Bid the better quality, more expensive, and greater quantity alternative.

#### 2.05 INQUIRIES & ADDENDA

- A. Requests for interpretation or correction of any ambiguity, inconsistency or error, which a Bidder may discover therein, shall be submitted to the Architect in writing.
- B. Any interpretation or correction will be issued in writing as an Addendum by the Architect. No Bidder shall rely upon any interpretation or correction given by any other method.
- C. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount.
- D. Verbal answers are not binding on any party.
- E. Clarifications requested by Bidders must be in writing not less than seven (7) days before date set for receipt of Bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to entities who have received documents directly from the Architect and available from the Pre-qualified General Contractors.

#### 2.06 SUBSTITUTIONS

- A. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents. Where the language "or approved equal" is used in the Bidding Documents, it is intended to require that all such materials and equipment shall be submitted as required by these Instructions to Bidders, and approved by the Architect prior to the receipt of Bids. See Section 01 60 00 - Product Requirements, for additional information and the required Contractor's Substitution Request form.
- B. Each request for substitution shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data, lists of similar successfully completed installations and references, and any other data or information necessary for a complete evaluation. A statement identifying changes in other material, equipment or other portions of the Work that incorporation of the proposed substitution would require shall also be included.
- C. If a Bidder proposes to use a material that while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, he shall inform the Architect in writing of the nature of such deviations at the time the material is submitted for review. It shall be the responsibility of the Bidder to notify the Architect, in writing, of the presence of asbestos or any other hazardous materials in any proposed substitution. Such written notice shall be in the form of a cover letter attached to the related documents.
- D. In requesting approval of deviations or substitutions, a Bidder shall provide evidence leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that otherwise attainable. If, in the opinion of the Architect, the evidence

presented does not provide a sufficient basis for such certainty, the Architect may reject such substitution or deviation without further investigation.

- E. In requesting approval of substitutions, a Bidder represents that he will provide the same warranty for the substitution that he would for that specified.
- F. The Contract Documents are intended to produce building improvements of consistent character and quality of design. The Architect shall judge the design and appearance of proposed substitutes on the basis of their suitability in relation to the overall design of the project, as well as for their intrinsic merits. The Architect will not approve as equal to materials specified proposed substitutions which, in his opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the Project.
- G. The Contractor shall be solely responsible for coordinating the installation of accepted substitutions, making such changes as may be required for the Work to be complete in all respects. Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner or the Architect, unless such substitution was made at the written request or direction of the Owner or the Architect.
- H. The burden of proof of the merit of a proposed substitution is upon the proposer. Approval of a proposed substitution is valid only upon issuance by the Architect in written form and the Architect's decision of approval or disapproval of a proposed substitution shall be considered final.
- I. Where the Bid Documents stipulate a particular product, substitutions shall be considered up to seven (7) days before receipt of Bids.
- J. When a request to substitute a product is made, the Architect may, or may not, approve the substitution and will issue an Addendum.

## 2.07 SITE EXAMINATION AND PREBID CONFERENCE

- A. Examine the Project site before submitting a Bid.
- B. A Bidders conference and project site tour has been arranged for Bidders at the existing Mid-Coast School of Technology, 1 Main Street, Rockland, Maine as follows:

**Monday July 10, 2017 at 2pm**

- C. Pre-qualified general contractors are invited.
- D. All interested Subcontract Bidders are invited.
- E. Representatives of Architect will be in attendance.
- F. Information relevant to the Bid Documents will be recorded in an Addendum.
- G. Informational documents are available for in-person review at the following locations:

**Lavallee Brensinger Architects**  
**305 Commercial Street**  
**Portland, Maine 04101**

**Note:**  
All Pre-qualified General Contractors  
have electronic copies of this information.

- 1. Informational Documents Include:
  - a. Geotechnical Reports

## QUALIFICATIONS

### 3.01 PREQUALIFICATION

- A. The Owner has prequalified General Contractors to Bid on this Project. Only those prequalified General Contractors shall submit a Bid on this Project.



**BID SUBMISSION****4.01 SUBMISSION PROCEDURES**

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

B. Submit bids in envelopes that read:

**Mid-Coast School of Technology – Region 8 Proposal**

**Not to be Opened until after 2:00pm on August 03, 2017**

B. The Bidder acknowledges the right of the Owner to reject any or all Bids and to waive any informality or irregularity in any Bid received, or to accept any Bid. In addition, the Bidder recognizes the right of the Owner to reject a Bid if the Bidder failed to submit the data required by the Bidding Documents, or if the Bid is in any way incomplete or irregular.

**4.02 BID INELIGIBILITY**

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

B. Bids are by invitation, only from prequalified General Contractor Bidders. Bids from unsolicited bidders may be returned.

**PERFORMANCE ASSURANCE****5.01 SECURITY DEPOSIT**

A. Bids shall be accompanied by a security deposit as follows:

1. Bid Bond in the amount of five per cent (5%) of the total bid amount on AIA A310 Bid Bond Form.
2. Endorse the Bid Bond in the name of the Owner as obligee, signed and sealed by the principal (Contractor) and surety.
3. The security deposit will be returned after delivery to the Owner of the required Performance and Payment Bond(s) by the accepted bidder.
4. Include the cost of bid security in the Bid Amount.
5. If no contract is awarded, all security deposits will be returned.

**5.02 BONDS**

A. Prior to the execution of the Contract, the selected Contractor shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Such bonds shall be in the amount of One Hundred Percent (100%) of the Contract sum, and shall be on forms as bound in the Bidding Documents, or as approved by the Owner. The premium shall be paid by the Contractor, and the securities secured through the Contractor's usual sources as may be agreeable to the parties. The Contractor shall deliver the required bonds to the Owner not later than the date of execution of the Contract, or if the Work is commenced prior thereto in response to a Letter of Intent, the Contractor shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be issued. Bonds shall remain in effect for not less than the entire guarantee period.

B. The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power of attorney indicating the monetary limit of such power.

C. Subcontractors: The following Sub-contractors shall be required to demonstrate the ability to furnish performance bonds covering the related scope of work representative of the subcontractor's bid to the General Contractor:

1. Mechanical sub-contractor(s): defined as HVAC and Plumbing
2. Electrical Sub-contractors
3. Sitework Sub-contractor

4. And any other sub-contractor(s) required by the General Contractor

Such bond shall be in the amount of One Hundred Percent (100%) of the bid sum. If the General Contractor requires the bond, provide a performance bond to the General Contractor as part of bid to the General Contractor.

**5.03 INSURANCE**

- A. Prior to the start of the Work, the Contractor shall furnish insurance certificates to the Owner and Architect as required in Section 00 73 00 - Supplementary Conditions.

**5.04 MISCELLANEOUS REGULATIONS**

- A. Attention is called to applicable Equal Employment Opportunity Provisions, Affirmative Action regulations and all requirements placed upon the Contractor thereunder.

**5.05 BID FORM SIGNATURE**

- A. The Bid Form shall be signed by the Bidder, as follows:
1. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
  2. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the Bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the Bid envelope.

**5.06 SELECTION AND AWARD OF ALTERNATIVES**

- A. Indicate variation of Bid price for Alternatives listed on the Bid Form. Unless otherwise indicated, indicate Alternatives as a difference in Bid price by adding to or deducting from the Base Bid price.

**OFFER ACCEPTANCE/REJECTION**

**6.01 DURATION OF OFFER**

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of sixty (60) days after the Bid closing date.
- B. Alternate Bids shall remain open to acceptance and shall be irrevocable for a period of ninety (90) days after the Bid closing date.

**6.02 ACCEPTANCE OF OFFER**

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

**END OF INSTRUCTIONS TO BIDDERS**

**SECTION 00 41 00**  
**BID FORM****PROJECT:** Mid-Coast School of Technology – Region 8, Rockland, Maine**DATE:** \_\_\_\_\_ 2017**TO:** Mid-Coast School of Technology- Region 8  
1 Main Street, Rockland ME 04841**SUBMITTED BY:**

Bidder's Full Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

**OFFER**

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents dated June 19, 2017 and prepared by Lavallee Brensinger Architects for the above mentioned Project, we, the undersigned, hereby offer to enter into a Contract to furnish all labor, materials, equipment and insurance and to fully perform the Work in strict accordance with the Contract Documents for the Sum of:

\_\_\_\_\_ dollars

(\$ \_\_\_\_\_), in lawful money of the United States of America.

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

All applicable federal taxes are included and State of Maine taxes are included in the Bid Sum.

**ALTERNATES**

Alternate prices are submitted as follows: (Use separate sheets as necessary):

Alternate No 1 Add \$ \_\_\_\_\_ Deduct \$ \_\_\_\_\_

**ACCEPTANCE**

- A. This offer shall be open to acceptance and is irrevocable for sixty (60) days from the Bid closing date.
- B. If this bid is accepted by Owner within the time period stated above, we will:
- Execute the Agreement within five (5) business days of receipt of Notice of Award and Notice to Proceed.
  - Furnish the required bonds within seven (7) business days of receipt of Notice of Award Notice to Proceed.
  - Commence work within seven (7) business days after written Notice to Proceed of this Bid.

- C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
- D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

**CONTRACT TIME**

- A. Owner's requirements for Contract Time are stated in Section 01 00 00 - General Requirements, Paragraph 1.13.
- B. If this Bid is accepted, we will:  
Complete the Work on or before the specified dates included in Section 01 00 00 – General Requirements, Paragraph 1.13.

**UNIT PRICES**

- A. The following are Unit Prices for specific portions of the Work as identified in Section 01 22 00 - Unit Prices The following is the list of Unit Prices:

Item 1: Alternate 1: Geothermal Dewatering: Set-up and water control measures for frac tanks / weir tanks, if determined by the geothermal engineer, site water control measures cannot control well water production: \$\_\_\_\_\_ per day cost.

Item 2: Misc Items:

- a. White Board: Furnish and Installation (10ft x 5ft board): \$\_\_\_\_\_ for providing and installing.

Item 3: Electrical Devices:

- a. Power outlet wired to nearest power source: \$\_\_\_\_\_ per completed device
- b. Power outlet wired to nearest available panel with associated 20AMP breaker:  
\$\_\_\_\_\_ per completed device
- c. Power for educational equipment, wired to nearest available panel with associated 50AMP breaker:  
\$\_\_\_\_\_ per completed device
- d. IT / AV / Communication outlet wired to associated patch panel location:  
\$\_\_\_\_\_ per completed / connected device

**ADDENDA**

- A. The following Addenda have been received. The modifications to the Bid Documents indicated below have been considered and all costs are included in the Bid Sum.

Addendum # s \_\_\_\_\_

**BID FORM SUPPLEMENTS**

- A. Within fourteen (14) days of the bid date, the selected bidder shall submit for review the Baseline Project Schedule as defined in Section 01 00 00 General Requirements
- B. Within fourteen (14) days of the bid date, the selected bidder shall submit for review a schedule of values divided into the relative spec sections divisions and further broken down into amounts no greater than \$50,000. This Schedule of Values, once accepted by the Owner, shall serve as the basis for each progress payment. Each scheduled activity shall be included in the Schedule of Values.

**BID FORM SIGNATURE(S)**

The Corporate Seal of \_\_\_\_\_

(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

\_\_\_\_\_  
(Authorized signing officer, Title)

(Seal)

\_\_\_\_\_  
**IF THE BID IS A JOINT VENTURE OR PARTNERSHIP, ADD ADDITIONAL FORMS OF EXECUTION FOR EACH MEMBER OF THE JOINT VENTURE IN THE APPROPRIATE FORM OR FORMS AS ABOVE.**

**END OF BID FORM**

**SECTION 00 52 00  
AGREEMENT FORM**

**PART 1 GENERAL  
FORM OF AGREEMENT**

**1.01 THE AGREEMENT TO BE EXECUTED, AIA A101, 2007 AS AMENDED, IS ATTACHED  
FOLLOWING THIS PAGE.**

**1.02 RELATED REQUIREMENTS**

- A. Section 00 72 00 - General Conditions.
- B. Section 00 73 00 - Supplementary Conditions.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF AGREEMENT**



# AIA<sup>®</sup> Document A101<sup>™</sup> – 2007

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

**AGREEMENT** made as of the \_\_\_\_\_ day of August in the year 2017  
(In words, indicate day, month and year.)

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

Mid-Coast School of Technology  
Region 8 Cooperative School Board  
1 Main Street, Rockland Maine

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

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

Mid-Coast School of Technology  
Region 8  
1 Main Street, Rockland Maine

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

Lavallee Brensinger Architects  
155 Dow Street  
Suite 400  
Manchester NH 03101

The Owner and Contractor agree as follows.

### **ADDITIONS AND DELETIONS:**

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

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

AIA Document A201<sup>™</sup>–2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



## TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
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3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS
10	INSURANCE AND BONDS

### ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

### ARTICLE 2 THE WORK OF THIS CONTRACT

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

### ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

*(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)*

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

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

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than Noted ( Below ) days from the date of commencement, or as follows:

*(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)*

Init.



Portion of Work	Substantial Completion Date
Phase 1: New Construction	May 01, 2019
Phase 1A: Geothermal Wells Temporary Parking	August 30, 2018
Phase 2: Existing School Demolition Complete Sitework	August 15, 2019

NOTE: See Phasing Plans and Construction Documents for more defined information

, subject to adjustments of this Contract Time as provided in the Contract Documents.  
(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

Refer to Supplemental General Conditions

#### ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$  
, subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:  
(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.3 Unit prices, if any: See Bid Forms  
(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

§ 4.4 Allowances included in the Contract Sum, if any:  
(Identify allowance and state exclusions, if any, from the allowance price.)

#### ARTICLE 5 PAYMENTS

##### § 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

Init.



§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 28th day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the 15th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than fifteen ( 15 ) days after the Architect certifies the Application for Payment.

NOTE: All payments by the Owner to the Contractor will be made by Electronic Transfer of Funds.  
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent ( 5 %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™–2007, General Conditions of the Contract for Construction;
- .2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of five percent ( 5 %);
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

- .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and  
(Section 9.8.5 of AIA Document A201–2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)
- .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–2007.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:

(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.



## § 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

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

## ARTICLE 6 DISPUTE RESOLUTION

### § 6.1 INITIAL DECISION MAKER

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

### § 6.2 BINDING DISPUTE RESOLUTION

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)*

- ☐ [ ]
- ☒ [ X ] Litigation in a court of competent jurisdiction
- ☐ [ ]

## ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

## ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.  
*(Insert rate of interest agreed upon, if any.)*

%

Init.

§ 8.3 The Owner's representative:  
(Name, address and other information)

§ 8.4 The Contractor's representative:  
(Name, address and other information)

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

§ 8.6 Other provisions:

#### ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A101–2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

| § 9.1.3 The Supplementary and other Conditions of the Contract: See Construction Documents

| § 9.1.4 The Specifications: See Project Manual  
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

| § 9.1.5 The Drawings: See Construction Documents  
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

| § 9.1.6 The Addenda, if any: See Construction Documents



Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

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

- .1 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

N/A

- .2 Other documents, if any, listed below:

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)*

N/A

**ARTICLE 10 INSURANCE AND BONDS**

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.

*(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)*

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

\_\_\_\_\_  
OWNER (Signature)

\_\_\_\_\_  
(Printed name and title)

\_\_\_\_\_  
CONTRACTOR (Signature)

\_\_\_\_\_  
(Printed name and title)

**SECTION 00 72 00  
GENERAL CONDITIONS**

**GENERAL**

**1.01 FORM OF GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT**

- A. AIA Document A201 - General Conditions of the Contract for Construction, 2007 Edition, attached, is the General Conditions between the Owner and Contractor.

**1.02 SUPPLEMENTARY GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT**

- A. Refer to Document 00 73 00 - Supplementary General Conditions, for amendments to these General Conditions.

**END OF DOCUMENT**

# **AIA**® Document A201™ – 2007

## **General Conditions of the Contract for Construction**

### **for the following PROJECT:**

*(Name and location or address)*

Mid-Coast School of Technology  
Region 8  
1 Main Street, Rockland Maine

### **THE OWNER:**

*(Name, legal status and address)*

Mid-Coast School of Technology  
Region 8 Cooperative School Board  
1 Main Street, Rockland Maine

### **THE ARCHITECT:**

*(Name, legal status and address)*

Lavallee Brensinger Architects  
155 Dow Street, Suite 400, Manchester, NH 03101

### **ADDITIONS AND DELETIONS:**

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Init.

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User Notes:

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User Notes:

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## Capitalization

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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 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 and certify termination of the Agreement under Section 14.2.2.

### **§ 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.



§ 1.2.2 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 will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment 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 this 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 material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them 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 material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

### § 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

## 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 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the



portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 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.

§ 2.2.3 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.

§ 2.2.4 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.

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

### § 2.3 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.

### § 2.4 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 written 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 deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor 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. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

## ARTICLE 3 CONTRACTOR

### § 3.1 GENERAL

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

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

§ 3.1.3 The Contractor shall not be relieved of 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 2.2.3, 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 make 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 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, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and 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 written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required 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 authorized by the Architect in accordance with Sections 3.12.8 or 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

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.

### § 3.6 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 21 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 an equitable adjustment 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 in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed 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.

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### § 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 furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply 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 SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be 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, 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 maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be 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 the way by which 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 requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing 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 written 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. 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 cause such services or certifications to be provided by a properly 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, accuracy and

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completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

### **§ 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, and 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 and patching shall be restored to the condition existing prior to the cutting, fitting and 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 such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's 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 or 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 Owner shall be entitled to reimbursement from the Contractor.

### **§ 3.16 ACCESS TO WORK**

The Contractor shall provide the Owner and Architect 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 such 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 the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such 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 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.

§ 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.

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

##### § 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, except as provided in Section 3.3.1.

§ 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 report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) 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 FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 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 13.5.2 and 13.5.3, whether or not such 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, material and equipment 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, unless otherwise specifically stated by the Architect, 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 authorize 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 duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 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 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 or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply 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 previously selected if the Owner or Architect makes reasonable objection to such substitution.

## § 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, 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, which the Contractor, by these 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 in writing; 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 such 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 Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

**§ 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 other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

**§ 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, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor 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 report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report 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, except as to defects not then reasonably discoverable.

**§ 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 the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors 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, and the Contractor shall proceed promptly, 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 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 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.

§ 7.3.6 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.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and 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

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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 7.3.7 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .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 related to the Work; and
- .5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 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 has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

### 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, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.



§ 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 an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order 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

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.

### § 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's 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. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material 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 material 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, material suppliers, or other persons or entities making a claim by reason of having 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 issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part 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 comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. 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. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. 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 material 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 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 the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 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 material or equipment suppliers 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 Architect will reflect such payment on the next Certificate 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 material and equipment 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 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, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment 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 and 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, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

#### § 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' written 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 shut-down, 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, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall 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 such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such 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 as required under Section 11.3.1.5 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 written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of 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 and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial 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 and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, 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. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including 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 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 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; or
- .3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material 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 or the Contractor's Subcontractors or Sub-subcontractors; 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 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 owners and users of adjacent sites and utilities.

§ 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, except damage or loss 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, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

#### § 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. 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 report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written 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 such material or substance or who are to perform the task of removal or safe containment of such 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 in the amount of the Contractor's reasonable additional costs of shut-down, 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 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 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 indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance 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 indemnify the Contractor for all cost and expense thereby incurred.

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## § 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 LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

### § 11.2 OWNER'S LIABILITY INSURANCE

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



### § 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

### § 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

### § 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 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, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

#### § 11.3.7 WAIVERS OF SUBROGATION

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, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, 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 covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

#### § 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

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



## ARTICLE 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, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

### § 12.2 CORRECTION OF WORK

#### § 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

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

#### § 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 an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written 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 2.4.

§ 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, whether completed or partially completed, of the Owner or separate contractors 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 except that, 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 such 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 such assignment.

### § 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

### § 13.4 RIGHTS AND REMEDIES

§ 13.4.1 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.

§ 13.4.2 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 there under, except as may be specifically agreed in writing.

### § 13.5 TESTS AND INSPECTIONS

§ 13.5.1 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 (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 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 13.5.1, 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 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 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.

§ 13.5.4 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.

§ 13.5.5 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.

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

#### § 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may 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.

#### § 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time 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 13.7.

### 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 or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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 promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor 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' written 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 for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, 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' written 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 as described in 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 written 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 Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.



## 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, 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.

#### § 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written 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 must 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 CONTINUING CONTRACT PERFORMANCE

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. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

#### § 15.1.4 CLAIMS FOR ADDITIONAL COST

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

#### § 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein 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.

§ 15.1.5.2 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.

#### § 15.1.6 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 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

### § 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, 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 arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no 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 such 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 an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, 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 15.1.6 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 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. 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 Either party, at its sole discretion, 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 Either party, at its sole discretion, 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 the Owner and Contractor under this Agreement.

**SECTION 00 73 00****SUPPLEMENTARY GENERAL CONDITIONS**

**THE SUPPLEMENTARY GENERAL CONDITIONS CONTAIN MODIFICATIONS, DELETIONS, AND/OR ADDITIONS TO THE AIA GENERAL CONDITIONS, 2007 EDITION. WHERE ANY PART OF THE AIA GENERAL CONDITIONS IS MODIFIED, DELETED OR SUPERSEDED BY THE SUPPLEMENTARY GENERAL CONDITIONS, THE UNALTERED PROVISIONS SHALL REMAIN IN FULL EFFECT.**

**MODIFICATIONS TO VARIOUS ARTICLES OF THE AIA GENERAL CONDITIONS****ARTICLE 1**

Article 1 - General Provisions: Subparagraphs 1.1.9, 1.1.10 and 1.1.11 shall be added to this Article as follows:

**1.1.9 PROVIDE:**

The term "provide" shall include furnishing and installing a product, materials, systems, and/or equipment, complete in place, fully tested and approved.

**1.1.10 CUSTOM:**

The term "custom" when referring to a material, color, finish design, pattern, or configuration shall be understood to mean as selected or determined by the Architect, and shall in no way be limited to any of the published offerings of the supplier or manufacturer.

Article 1 - General Provisions: Subparagraph 1.2.1 shall have the following added to the end of the last sentence:

Should the Contract Documents disagree in themselves or with each other, the Contractor shall provide the better quality or greater quantity of work and materials, as interpreted by the Architect, unless specifically otherwise directed by written Addendum to the Contract.

Article 1 - General Provisions: Subparagraph 1.2.2 shall have the following added to the end of the last sentence:

The Contractor and all subcontractors shall refer to **all the Contract Documents**, including those not specifically showing the Work of their specialized trades, and shall perform all work reasonably inferable from them as being necessary to produce the intended results.

Article 1 - General Provisions: Subparagraphs 1.2.4 through 1.2.12 shall be added to this Article as follows:

1.2.4 All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

1.2.5 Where codes, standards, requirements and publications of public and private bodies are referred to in the Contract Documents, such references shall be understood to be to the latest revision prior to the date of receiving Bids, except where otherwise indicated. These standards are not furnished to Bidders for the reason that the Bidders are assumed to be familiar with their requirements. The Architect will furnish, upon written request, information for obtaining copies of the standards referred to.

1.2.6 Where no explicit quality or standards for materials or workmanship are established for work, such work is to be of good quality for the intended use and consistent with the quality of the surrounding work and of the construction of the Project generally.

1.2.7 All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, adjusted, and conditioned in accordance with the manufacturers'



written or printed directions and instructions, unless specifically otherwise indicated in the Contract Documents.

1.2.8 For convenience, the Specifications have been arranged in Sections, but such separation shall not be considered as the limits of the Work required of any separate trade. The terms and conditions of such limitations shall be exclusively between the Contractor and his subcontractors. Requirements contained in any Section shall be required as if contained in all Sections and the Contractor shall, prior to awarding subcontracts, assure himself that the entire Work as a whole has been coordinated among the subcontracts.

1.2.9 The Drawings are generally made to scale, but all working dimensions shall be taken from the figured dimensions or by actual measurements at the job; in no case by scaling. Study and compare all the Drawings and verify all figures before laying out or constructing work. The Contractor shall be responsible for errors in his work that might have been avoided thereby. Whether or not an error is believed to exist, deviation from the Drawings and the dimensions given thereon shall be made only after approval in writing from the Architect.

1.2.10 The Plumbing, Mechanical, Fire Protection (sprinkler) and Electrical Drawings, when provided, are diagrammatic only, and are not intended to show the exact physical locations or configurations of work. Such work shall be installed to clear all obstructions, permit proper clearances for the work of other trades, and any exposed items shall be located as directed by the Architect. Locations of fixtures and outlets shall be obtained from the Architect before the Work is roughed in; work installed without such information from the Architect shall be relocated at the Contractor's expense.

1.2.11 Surveys, test borings, test pits, or other soil test information when included with the Contract Documents or otherwise made accessible to the Contractor, were obtained by the Owner for use by the Architect in design. The Owner and Architect, do not represent such information to be complete, accurate or approximate indications of actual site or subsurface conditions.

1.2.12 Where the Work is to fit with existing conditions or Work to be performed by others, the Contractor shall fully and completely join the Work with such conditions or Work, unless otherwise specified.

Article 1 - General Provisions: Add the following sentences to Subparagraphs 1.4 as follows:

1.4 The Architect shall not be considered the arbiter of the work between trades assigned by the general contractor. The Contractor shall ensure properly trained tradesmen install the work in accordance with the contract documents and Contractor-Sub-contractor Agreements.

### **ARTICLE 3**

Article 3 - Contractor: Subparagraph 3.2.2 shall be revised as follows:

3.2.2 Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents (including existing Drawings if available) relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.23, shall take field measurements of any existing conditions related to that portion of the Work and shall observe and document any conditions at the site affecting it. Before starting the Work, and at frequent intervals during the progress thereof, the Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by the Owner pursuant to Subparagraph 2.2 and shall at once report to the Architect any error, inconsistency or omission the Contractor may discover. Any necessary change shall be ordered as provided in Article 7, subject to the requirements of Article 1.2 and other provisions of the Contract Documents. If the Contractor proceeds with the Work without such notice to the Architect, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents the Contractor should have discovered such, the Contractor shall bear all costs arising therefrom.

Article 3 - Contractor: Subparagraph 3.2.5 shall be added to this Article as follows:

3.2.5 The Contractor shall give the Architect timely notice of any additional drawings, specifications or instructions required to define the Work in greater detail or to permit the proper progress of the Work. Any design errors or omissions noted by the Contractor during his view of documents shall be promptly reported to the Architect.

The Contractor shall not proceed with any work not clearly and consistently defined in detail in the Contract Documents, but shall request additional Drawings, Specifications, or Instructions from the Architect. If the Contractor proceeds with such work without obtaining further drawings or instructions, he shall assume full responsibility for the results thereof, and if such work is discovered to be incorrect he shall correct it at his own expense.

Article 3 - Contractor: Subparagraph 3.5.1 shall be added to this Article as follows:

3.5.1 The Contractor shall be responsible for determining that materials furnished for the Work meet all requirements of the Contract Documents. The Architect may require the Contractor to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the Architect, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at the Contractor's expense. This provision shall not require the Contractor to pay for periodic testing of different batches of the same material, unless such testing is specifically required by the Contract Documents to be performed at the Contractor's expense.

Article 3 - Contractor: Delete Subparagraph 3.8 Allowances

Article 3 - Contractor: The following shall be added to the end of Subparagraph 3.10.1:

The Schedule shall be prepared using the Critical Path Method (CMP) for each phase and the entire project. Include CMP milestones for major portions of the work leading to each required phase completion date. The initially submitted and accepted Critical Path shall not change during the project. Time is of the essence and any request for a time extension due to action by the Owner shall require demonstration that such action has impacted the Critical Path.

Article 3 - Contractor: The following shall be added to the end of Subparagraph 3.10.2:

The Contractor's submittal schedule shall be tied to the Critical Path and major milestones to allow appropriate time for proper preparation, review, and subsequent ordering and installations. No payment shall be due the Contractor prior to the CPM and submittal schedules having been accepted by the Owner and Architect.

Article 3 - Contractor: Subparagraph 3.11 shall be revised to read as follows:

3.11 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications in good order and marked currently to record changes and selections made during construction, and in addition, reviewed Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and, along with reproducible copies as identified elsewhere in the Contract Documents, shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

Article 3 - Contractor: Subparagraph 3.12.5 shall have the following words removed from this requirement: "...or, in the absence of an approved submittal schedule,..."

Article 3 - Contractor: Subparagraph 3.12.5 shall have the following added to the end of its last sentence:

It is the intent of this Contract that the use of asbestos containing materials and/or other hazardous materials be prohibited. Prior to Substantial Completion, the Contractor shall submit written certification that no asbestos and/or other hazardous substances have been incorporated into the Work.



In failing to provide such certification, the Contractor shall assume full responsibility related thereto, and shall be responsible for all injury and/or damages, and shall provide all necessary replacement or corrective work at no additional cost to the Owner.

Article 3 - Contractor: Subparagraph 3.12.6 shall be revised to read as follows:

3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar materials, the Contractor represents to the Owner and Architect that the Contractor has determined and verified materials, dimensions, quantities, field dimensions, relations to existing work, coordination with work to be installed later, coordination with information on previously reviewed Shop Drawings, Product Data, or Samples and verification of compliance with all of the requirements of the Contract Documents. The completeness and accuracy of all such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, and Samples, the Architect and Owner shall be entitled to rely upon the Contractor's representation that such information is complete, accurate and correct.

Article 3 - Contractor: Subparagraph 3.12.7 shall be revised to read as follows:

3.12.7 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar materials until the respective submittal has been reviewed by the Architect. Such work shall be in accordance with reviewed submittals.

Shop Drawings, Product Data and Samples submitted to the Architect without the Contractor's signed stamp of approval thereon will be returned without action.

The Contractor shall also, upon delivery of submittals, provide written notice of any deviation in the Shop Drawings, Product Data or Samples from the requirements of the Contract Documents.

Article 3 - Contractor: Subparagraph 3.12.8 shall be revised to read as follows:

3.12.8 The Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's review of Shop Drawings, Product Data, Samples, or similar materials unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in the Shop Drawings, Product Data, Samples, or similar materials by the Architect's review thereof.

Article 3 - Contractor: Subparagraph 3.12.9 shall have the following added to the end of its last sentence:

3.12.9 Unless such written notice has been given, the Architect's review of a resubmitted Shop Drawing, Product Data, Sample or similar material shall not constitute acceptance of any changes not specifically requested on the prior submittal.

Article 3 - Contractor: Subparagraph 3.12.10 shall be revised as follows:

3.12.10 Delete the word "all" in the third and sixth sentences, when referring to performance and design criteria. The Owner and the Architect may generally provide such information. However, under certain circumstances the providing of such information may more appropriately be the responsibility of the party engaged by the Contractor for related architectural or engineering services.

Article 3 - Contractor: Subparagraph 3.12.11 shall be added to this Article as follows:

3.12.11 No claim for delay shall be allowed on account of failure of the Architect to furnish instructions or to return Shop Drawings, Product Data, Samples, or similar materials until two (2) weeks after receipt by the Architect by registered or certified mail of a written demand for such instructions, drawings, or samples, and not then unless such claim be reasonable. No claim for delay will be reviewed without evidence that demonstrates reason for delay has been caused by the Owner and has impacted the accepted Critical Path activities.

Article 3 - Contractor: Subparagraph 3.12.12 shall be added to this Article as follows:

3.12.12 The Contractor shall provide all calculations and certificates of compliance and performance as identified throughout the Contract Documents. He shall be responsible for their preparation and submission and the Owner and Architect shall be entitled to rely upon the completeness and accuracy of all such calculations and certifications. Failure to submit such calculations and certificates prior to Substantial Completion shall be considered representation of full compliance, as if they had been fully executed and provided for the Owner and Architect's records.

Article 3 - Contractor: Subparagraph 3.12.13 shall be added to this Article as follows:

3.12.13 The Contractor shall be allowed one (1) submission, plus one (1) revision to obtain the Architect's review and acceptance of Shop Drawings, Product Data, Samples or similar materials. Incorrect, incomplete or otherwise unacceptable submissions, that require additional submittals shall be reviewed by the Architect subject to back-charges to the Contractor for the cost of the Architect's related services.

#### **ARTICLE 4**

Article 4 - Administration of the Contract: Subparagraph 4.2.7 shall be revised to change all references to the Architect's "approval" of submittals to "review". Delete the words "...or, in the absence of an approved submittal schedule,..."

Article 4 - Administration of the Contract: Subparagraph 4.2.9 shall be revised to change all references "inspections" to read "site visit observations".

#### **ARTICLE 5**

Article 5 - Subcontractors: Subparagraph 5.2.5 shall be added to this Article as follows:

5.2.5 Provisions contained in Paragraphs 5.2.1 through 5.2.4 shall apply to all Subcontractors as set forth in the Instructions to Bidders or Instructions to Sub-Bidders.

Article 5 - Subcontractors: Subparagraph 5.3.1 shall be added to this Article as follows:

5.3.1 Nothing contained in the Contract Documents shall create any contractual relations between the Owner or Architect and any Subcontractor or Sub-subcontractor, nor shall there be any obligation on the Owner to pay or to see to the payment of any sums due any Subcontractor, nor create any obligation of any kind, express or implied, upon the Owner or Architect in favor of any Subcontractor or Sub-subcontractor.

#### **ARTICLE 7**

Article 7 - Changes in the Work: Sub-subparagraph 7.3.3.2 shall be revised to read as follows:

7.3.3.2 Unit prices stated in the Contract Documents or subsequently agreed upon. Should the Owner choose to accept proposed unit prices, his acceptance thereof presupposes their reasonably representing the actual cost of the Work involved, plus a fair and reasonable allowance for overhead and profit. "Cost" shall be defined as described in Paragraph 7.3.7 of the General Conditions.

Article 7 - Changes in the Work: Sub-subparagraph 7.3.3.5 shall be added to read as follows:

“.5 Other; as defined by the Architect and Owner.”

Article 7 - Changes in the Work: Subparagraph 7.3.7 shall have the end of its first sentence revised to read as follows (starting after the word “change”):

...including, in case of an increase in the Contract Sum, an allowance for overhead and profit in accordance with Paragraph 7.3.11 below.

Article 7 - Changes in the Work: Subparagraph 7.3.7 shall revise 7.3.7.5 to read as follows:



“Additional General Contractor costs for providing additional construction supervision directly attributable to the change. Additional construction supervision shall include submission of personnel resume and experience for acceptance by the Owner.”

Article 7 - Changes in the Work: Subparagraph 7.3.11 shall be added to this Article as follows:

7.3.11 In subparagraph 7.3.7 the allowance for overhead and profit combined, included in the total cost to the Owner, shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, five percent (5%) of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor or material supplier, five percent (5%) of the amount due the Subcontractor or material supplier.

.3 For each Subcontractor or Sub-Subcontractor involved, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, five percent (5%) of the cost.

.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with subparagraph 7.3.7.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete and detailed itemization of all costs, including labor, material and subcontracts. In no case will a change involving over \$500.00 be approved without such itemization.

.7 No percentage for overhead and profit will be allowed on changes in the Work which are set forth as unit price items, as the percentage for same shall be included in said unit prices.

## ARTICLE 8

Article 8 - Time: Subparagraph 8.3.4 shall be added to this Article as follows:

8.3.4 In planning his construction schedule within the agreed upon Contract Time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions normal to that of Work for the season(s) of the year(s) involved. Only those weather delays attributable to other than normal weather conditions will be considered by the Owner and Architect.

Article 8 - Time: Subparagraph 8.3.5 shall be added to this Article as follows:

8.3.5 Delays in the execution of portions of the Work, which do not necessarily prevent or delay the execution of other parts of the Work and, which do not necessarily prevent the completion of the whole of the Work within the time specified, shall not be considered justifiable cause for extension of the Project completion date. Specific reference is made to the Contractor's Critical Path Schedule.

Article 8 - Time: Subparagraph 8.3.6 shall be added to this Article as follows:

8.3.6 In the event of unexcused delay by the Contractor, the Owner and the Contractor agree that Owner's actual damages are difficult to quantify. The cost to the Owner of administration of the Contract, inspection and over-sight of the Work, and accommodating the Owner's programming will be increased in the event of such delay. For each calendar day that the time allotted in the Contract, including authorized adjustments, for substantial completion of Phase 1 is exceeded, and for each calendar day that the Contract Time, as defined in section 8.1.1 of the General Conditions is exceeded, Owner and Contractor agree that the Contractor shall pay liquidated damages. The amount of liquidated damages shall be \$3,450/day for exceeding the time allotted for substantial completion of Phase 1, May 15, 2019. And the amount of liquidated damages shall be \$3,450/day for exceeding the Contract Time allotted for other phases beyond the specified Substantial Completion date of the Work, August 15, 2019. The Owner and Contractor agree that these amounts are reasonable and do not constitute penalties. Without

limitation of its other remedies, Owner may deduct said liquidated damage amounts from any money due the Contractor.

## ARTICLE 9

Article 9 - Payments and Completion: Subparagraph 9.2 shall remove the following words:

“...or GMP...”

Article 9 - Payments and Completion: Subparagraph 9.3.1.3 shall be added to read as follows:

9.3.1.3 Contractor shall submit, with each application, a general contractor and each sub-contractor release of lien for all work completed and invoices for the month before.

Article 9 - Payments and Completion: Subparagraph 9.3.2 shall have the following added to the end of the last sentence:

In addition to all other procedures required by the Owner for the protection of his interests, the Contractor, in submitting an Application for Payment, certifies that he has visited all locations of materials and equipment stored off-site and verified the types and quantities of materials and equipment stored as well as the suitability and security of the storage facilities. Photos of such materials and equipment shall be produced upon request by the Owner or Architect.

Article 9 - Payments and Completion: Subparagraph 9.6.1 shall be revised to read as follows:

9.6.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided in the Conditions of the Contract as follows, and shall so notify the Architect:

.1 On or about the twentieth day of each month, for work completed before the first day of the month, ninety-five percent (95%) of the portion of the Contract Sum properly allocated to labor, materials and equipment incorporated in the Work and ninety-five percent (95%) of the portion of the Contract Sum properly allocated to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, less then aggregate of previous payments in each case.

.2 Upon Substantial Completion of the entire Work, the five percent (5%) retainage shall be reduced to one hundred and fifty percent (150%) of the value of all incomplete Work and unsettled claims, as determined by the Architect.

.3 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be paid by the Owner to the Contractor thirty (30) days after Substantial Completion of the Work unless otherwise stipulated in the Certificate of Substantial Completion, provided the Work has been completed, the Contract fully performed, and a final Certificate for Payment has been issued. Final payment will be made to the Contractor only after final review and acceptance of all the Work by the Owner, and the Contractor has furnished satisfactory release of liens or claims for liens by the Contractor, subcontractors, laborers, and the material suppliers.

.4 All payments shall be subject to the approval of the Owner, who retains the right to review and fully approve the Work prior to release of payments.

.5 All payments shall be made by electronic file transfer from the Owner to the Contractor.

Article 9 - Payments and Completion: Subparagraph 9.8.4 shall have its last sentence revised to read as follows:

Warranties and guarantees 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 Contract Documents or Certificate of Substantial Completion.



**ARTICLE 10**

Article 10 - Protection of Persons and Property: Paragraph 10.3 shall be revised to include not only asbestos and polychlorinated biphenyl (PCB), but also petroleum or petroleum by products and any other toxic or hazardous substances, which may be discovered or otherwise deposited at the Project.

Article 10 - Protection of Persons and Property: Subparagraph 10.3.2 shall be revised to read as follows:

10.3.2 The Owner will retain the services of a licensed hygienist consultant to attend to any HAZMAT items questioned or reported by the Contractor, and if found to be HAZMAT, will remediate and render it harmless. Upon request from the Contractor, the Owner's consultant will test and recommend appropriate action if found to be classified as HAZMAT. The Owner's hygienist consultant will then arrange for the removal of any materials found to be HAZMAT. The Contractor shall coordinate and schedule the work around the removal of such materials.

Article 10 - Protection of Persons and Property: Subparagraph 10.3.7 shall be added to this Article as follows:

10.3.7 The Architect's scope of services and responsibilities excludes work related to asbestos, radon, petroleum and petroleum by products, polychlorinated biphenyl and other toxic or hazardous substances. Therefore, the Architect shall have no responsibility for any consequences resulting from the investigation, discovery, detection, identification, presence, leakage, discharge, release, use, handling, disposal, encapsulation, abatement, treatment, or removal of, or exposure of a person or persons to hazardous materials, pollutants, contaminants, or disease transmitting organisms, pre-existing or otherwise deposited in any form at the project, indoors or outdoors, at any time before, during or after construction, including but not limited to volatile organic compounds, petroleum products, bacteria, molds, fungus, asbestos or asbestos products, lead, radon, electro-magnetic frequency radiation or other radiation.

Article 10 - Protection of Persons and Property: Subparagraph 10.3.8 shall be added to this Article as follows:

For work assigned to the Contractor by the Owner, the Contractor shall be responsible for compliance with all applicable Local, State, and Federal environmental regulations, including but not limited to the National Emission Standard for Hazardous Air Pollutants, as enforced by the United States Environmental Protection Agency. It shall be the Contractor's responsibility to provide all inspections and notifications related thereto.

**ARTICLE 11**

Article 11 - Insurance and Bonds: The following shall be incorporated into Article 11. Insurance and Bonds:

For at least the duration of this Contract, the Contractor shall maintain insurance with minimum limits of not less than those defined in AIA Document G612, as executed by the Owner and bound herein.

Article 11 - Insurance and Bonds: Subparagraph 11.1.4 shall have the following added to the end of its last sentence: The full benefits of such insurance shall be available to the Owner and Architect, whose coverage as additional insureds shall not in any way be compromised by endorsements or other modifications to the Contractor's policy.

**ARTICLE 12**

Article 12 – Uncovering and Correction of Work: Subparagraph 12.2.2.1 shall revise the reference to "...one-year period for correction..." to read "...two-year period for correction..."

**ARTICLE 13**

Article 13 - Miscellaneous Provisions: Paragraph 13.5 Testing and Inspections. Subparagraph 13.5.1 shall revise the cost references to testing and inspection payments to state the independent testing agent shall be paid for by the Owner, and coordinated by the Contractor to expeditiously complete the work.

Article 13 - Miscellaneous Provisions: Paragraph 13.7 Limits of Claims, shall have the end of its first sentence revised to read: ".... but in any case not more than eight (8) years after the date of Substantial Completion of the Work; or as required by Maine State law."

**ARTICLE 15**

Article 15 – Claims and Disputes: Subparagraph 15.1.6 Claims for Consequential Damages shall be deleted in its entirety.

Article 15 – Claims and Disputes: Subparagraph 15.3.1 Add the following sentence: Parties agree to mediate any dispute after Substantial Completion is achieved.

Article 15 – Claims and Disputes: Subparagraph 15.4 Arbitration shall be deleted in its entirety.

**END OF SUPPLEMENTARY CONDITIONS**



**SECTION 01 00 00**  
**GENERAL REQUIREMENTS**

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. The General Conditions, Supplementary General Conditions and Special Conditions of this Contract shall apply to each and every contract and contractor or other person or persons supplying labor, material, equipment and/or services entering into this Project and/or on the premises directly or indirectly.
- B. Work Included in This Contract:
  - 1. Providing all labor, materials, equipment, and services, etc., as required to properly complete all Work identified in, implied by or otherwise required by the Contract Documents.
- C. Work Excluded from This Contract:
  - 1. Providing equipment noted as “Not in Contract” (N.I.C.) or “By Owner,” (B.O.) or “By FFE Vendor” or “By Third Party Vendor”. The Contractor shall, however, provide services and coordination related to items not in the Contract as otherwise required or implied by the Contract Documents.

**1.02 GENERAL RESPONSIBILITIES OF THE CONTRACTOR**

- A. Regulations: The Contractor shall fully comply with all governing Local, State and Federal Laws, Codes, Rules, Regulations and Ordinances, including but not limited to The Americans with Disabilities Act, Equal Employment Opportunity and Affirmative Action provisions, and Occupational Safety and Health Administration provisions.
  - 1. **NOTE:**  
Per EPA regulations, beginning April 2010, contractors performing renovation, repair, and painting in residential, childcare and school projects that disturb lead paint (assumed to be any building construction prior to 1978) shall be certified and shall follow specific work practices that include notification of occupants and sealing off the work area. The rule does not apply to minor maintenance or repair activities where less than six square feet of lead-based paint is disturbed in a room or where less than 20 square feet of lead-based paint is disturbed on the exterior.
- B. Permits: The Contractor shall obtain and pay for all permits and arrange for necessary inspections and approvals from the authorities having jurisdiction. Should any changes be necessary in the Contract Documents to secure such approvals, the Contractor shall promptly notify the Architect.
  - 1. For the Owner's records, submit copies of permits, licenses, inspection reports, certifications, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing on the Work.
  - 2. The City will require payment for all required Building Permits.
- C. Coordination: The Contractor shall be fully responsible for coordinating all construction activities to assure efficient and orderly installation of each part of the Work. In general coordination duties shall include, but not be limited to verifying dimensions and existing field conditions, coordinating construction operations, establishing on-site lines of authority and communication, monitoring schedules and progress, monitoring quality, maintaining records and reports and in general assuring the proper administration of the Work.
  - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
  - 2. Where installation of a component or system involves installation of component parts by multiple subcontractors, the Contractor shall inventory, store, and distribute parts to appropriate installers.

3. Where structural, electrical, plumbing, fire protection, or mechanical components such as foundations, columns, beams, ductwork, piping, raceways, etc... are installed, the Contractor shall coordinate the installations to avoid conflicts with wall partitions, ceiling heights, or other finish material requirements. Coordinate all components between the trades. If any space conflicts cannot be resolved, immediately notify the Architect.
  - A. The Contractor shall be responsible for the coordination of all mechanical, plumbing, fire protection, and electrical work to ensure compliance with exposed structure, exposed fixture and devices, finish ceilings, walls, floors, and finishes as depicted and specified within the architectural drawings and specifications. The Contractor shall investigate, along with the trades, all existing underground site conditions with new construction and verify locations on the Coordination Drawings.
  - B. Well in advance of ordering and fabricating materials, the Contractor shall submit to the architect and engineer coordination drawings depicting how all components fit within the Work. Such drawings shall be at a scale of  $1/4" = 1'-0"$ . Congested areas shall be at a scale no less than  $3/8" = 1'-0"$ . All potential conflicts shall be highlighted with resolution suggestions provided by the Contractor.
  - C. HVAC duct and piping coordination drawings shall be produced using the structural steel shop drawing erection plans and reflected ceiling plans. These Steel-Duct-Piping drawings shall be submitted for review by the Contractor no later than ninety (90) days from the commencement of Work. This process shall start with underground utilities within the structural foundations to avoid any conflicts during installation.
  - D. Subsequent work shall be added by the trades to produce drawings that indicate all routes for all ductwork, piping, conduit, off-sets, access panels, dampers, etc... to maintain required ceiling heights and partition locations; as well as requirements for areas of exposed infrastructure.
  - E. It shall be understood that in areas of exposed infrastructure, many steel, mechanical, electrical, fire protection, etc... systems are to be installed to remain exposed to view and shall be installed with a high level of workmanship and prepared for finish painting. Installation shall be tight to deck, steel beams, steel columns, and steel frames; as well as walls and installed equipment.
  - F. Coordination Drawings shall bear the submittal stamp of the Contractor and signatures of all mechanical, plumbing, fire protection, and electrical trades indicating that all areas have been reviewed and space conditions have been resolved.
  - G. This process shall be completed within one hundred and twenty (120) days of Work commencing.
  - H. Architect's review of coordination drawings shall not relieve the Contractor's responsibility to coordinate the Work. Completed coordination drawings shall be used to install the Work, and shall not be used to replace any required shop drawings, submittal, "as-built" or other record drawings.
  - I. The design team has produced a Building Information Model for use in the development of the construction documents. This model may be used by the Contractor for these coordination efforts; subject to the electronic file transfer agreement. Use of the Building Information Model is not required; but is made available. If DWG files are requested, subject to the electronic file transfer agreement, the DWG files will be produced from REVIT (BIM software); not from AutoCAD and shall be provided "as-is"; which may not be reflective of the printed construction documents.
4. Where inspections or approval of a substrate or component to be concealed by another is required, coordinate construction activities and notification of Architect or inspecting party. Do not conceal substrate or component until it has been inspected and is satisfactory.
5. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service, and repair.
6. Make adequate provision to accommodate items scheduled for later installation.



7. Coordinate and schedule the Work with the Owner's vendors to avoid conflicts in installation schedules; including, but not limited to furniture, fixtures, equipment, educational lab equipment, control and alarm systems, and testing / commissioning activities.
  8. Coordinate completion and clean-up of Work in preparation of Substantial Completion.
  9. After Owner occupancy, coordinate access to site for correction of defective or incomplete Work to minimize disruptions to Owner's activities.
- D. Supervision – Construction Superintendent: The Contractor shall place and maintain a competent, experienced construction Superintendent in charge of the Work on the job site at all times while work is in progress, including overtime operations by the Contractor's forces or by subcontractors. Contractor's Site Supervisor shall not be part of the workforce, installing or laboring over work. No changes in this position shall be made without the Owner's prior approval. The Owner shall have the right to review the qualifications of the proposed Superintendent and ask for a replacement if in the Owner's opinion the person does not meet the qualifications that the project will demand. The same superintendent who was in charge during the general progress of the Work shall oversee the completion of all punch list items.
1. The Contractor shall be responsible for the strict enforcement of the following requirements:
    - a. All persons working on the Project site shall be required to conduct themselves in a courteous and professional manner. The use of profane language shall be strictly prohibited.
    - b. Smoking, alcoholic beverages, and impairment supplements shall be strictly prohibited on the Project site, or within sight of the Project site.
    - c. The use of radios, entertainment media, etc. shall be strictly prohibited.
    - d. Contact with the occupants and visitors of the existing building located on the site shall be prohibited. The Contractor's site supervisor shall be the only individual to contact the Owner's designated school official (Project Coordinator). The Contractor's superintendent shall communicate with school officials to the extent necessary for the safe and proper execution of the Work only; and not for requests to make changes, approve costs, or discuss alternative installations.
    - e. Contractor's forces shall not trespass on neighboring property or interact with neighbors.
    - e. All construction personnel shall be issued identification badges by the Contractor, which shall be conspicuously displayed at all times while on the construction site.
- E. On-Site Documents: The Contractor shall provide in a visible and accessible location in the on-site office:
1. Complete, currently updated set of Specifications and Drawings, Change Orders, reviewed Shop Drawings, and other reviewed documents and samples to be incorporated into the Work.
  2. Permits and notifications required by laws and regulations.
  3. Standards, manuals, installation instructions, or reports required by individual Specification sections.
  4. Product MSDS Sheets.
  5. List of Owner, Owner's Representative, Architect, Architect's Consultants, Contractor's project manager, superintendent, assistant superintendent, subcontractors, building inspector, police, ambulance and fire departments; include telephone numbers and other relevant contact information.
- F. Accommodation and Cooperation with the Owner: The Contractor shall cooperate with the Owner to the greatest extent possible. Disruptions and inconveniences to the activities of existing facilities to remain in operation during construction shall be minimized, and shall be subject to the prior approval of the Owner. The Contractor's cooperative efforts shall include, but shall not necessarily be limited to:
1. Maintaining fire and all other safety standards acceptable to governing authorities.

2. Protecting existing building construction, landscaping, site utilities, site improvements and features, and all other improvements within and about the project area. See Division 2 for more information.
3. Obtaining abutters' written authorization to conduct construction related activities on their properties, if required. NOTE: The Contractor shall obtain permits and approvals required to temporarily alter or obstruct sidewalks, existing parking lots, and street(s) if required.
4. Storing on-site materials at locations acceptable to the Owner and governing authorities.
5. Controlling construction staging, parking, and traffic and limiting it to areas acceptable to the Owner and governing authorities.
6. Providing access for and cooperating with other contractors to be employed by the Owner.
7. Providing access for and cooperating with equipment and furnishing suppliers/installers (including the Owner's own forces) to be employed by the Owner.
8. Accommodating existing occupants and other ongoing activities within and about the Project. Such accommodations shall include, but shall not necessarily be limited to:
  - a. Maintaining safe site travel and egress acceptable to governing authorities.
  - b. Maintaining adequate infrastructure connections to the existing building on-site.
  - c. Maintaining water for domestic, heating, and fire suppression systems.
  - d. Maintaining electrical power, fuel, fire alarm, and detection systems, sound systems, clock systems, intrusion detection systems, television, computer, telephone services, and all other existing services and systems to the existing building on-site.
  - e. Erecting and maintaining temporary fencing and barriers to separate Work areas from existing site use and on-going operations.
  - f. Maintaining suitable toilet and janitorial facilities.
  - g. Providing proper dirt, dust, fume, vapor, and noise control. NOTE: The Contractor shall take special precautions to prevent the introduction of construction related dust, fumes, vapors, etc. from entering existing fresh air intakes, doors, windows, etc.
  - h. Providing temporary fire and smoke barriers between the existing building and construction site, acceptable to governing authorities.
  - i. Providing secured a building and site with security measures in all areas under the Contractor's control.
  - j. Scheduling work within the existing facility at times acceptable to the Owner and least disruptive to ongoing activities for any utility connection requirements and shut-downs. Existing school facilities shall remain in operation during the execution of the Work of this Contract. The Contractor shall schedule, phase, and coordinate the Work as required to maintain the safe and functional use of such facilities; including delivery and construction sequencing around school busing, staff traffic, evening activities, etc...

G. Phasing and Work Scheduling

1. The following shall serve as a general description of the Owner's scheduling requirements related to the Work of this Contract. It is provided for the Contractor's use in preparing an acceptable schedule and executing the Work at times and in a manner least disruptive to ongoing activities.

Prior to completing and distributing the Construction Schedule or proceeding with the Work, the Contractor shall meet with the Owner and Architect, accurately assess the Owner's requirements relative to the use of existing facilities, and schedule the Work accordingly.
2. The following shall serve as a general description of the Work Phasing Plan, developed by the Owner and Architect related to the Work of this Contract. It has been developed to accommodate Owner needs for on-going occupancy of the existing facility and site. It shall be understood that this initial Phasing Plan is subject to change(s) made by the Owner or initiated by the Contractor and agreed to by the Owner. The provision of this plan shall not in any way limit or diminish the Contractor's responsibility for the proper scheduling and coordination of the Work. See Work Phasing Plans for more information.
3. Coordination:



- a. All subcontractors shall coordinate with the Contractor to determine all phasing and sequencing requirements and to schedule the Work. Work shall be executed in such a manner that shall cause minimal or no disruptions of the Owner's activities and the activities of other trades.
  - b. Coordinate all shut-downs, service disruptions, demolition, removals, temporary connectors, service change-overs, etc., required to avoid Owner disruption and/or inconvenience.
  - c. Coordinate all deliveries, installation, etc, as required to avoid Owner disruption and inconvenience.
  - d. Partial and phased occupancy of the facility shall require system start-ups, tests, balancing, commissioning, and other similar activities to occur as work progresses, instead of exclusively at the completion of the entire Project. The Owner will relocate a large amount of existing educational and operational equipment into the new Project. Relocation, placement, and connections for all these items shall be coordinated, scheduled, implemented, and completed by the Contractor. See Equipment plans.
  - e. See Section 01 78 10 - Warranties for requirements regarding warranties for equipment serving phased occupancy.
- H. Safety: The Contractor shall assume full responsibility for all means, methods, procedures, sequences and techniques of construction employed and shall take all measures required to ensure the safety of construction workers and the safety of the general public, staff and students. The Contractor shall take into full consideration and confirm that all necessary barricades, fencing, and shoring are provided and that they comply with applicable regulations and standards of good practice. The public shall be guarded from all construction hazards and attractive nuisances. The construction site is nearby major public thoroughfares. Therefore, site safety is of the utmost importance. The Contractor shall pay all costs necessary for temporary partitioning, barricading, fencing, shoring, walks, ramps, enclosures, flashing lights, warning signs, security and safety devices required for the maintenance of a clean and safe construction site.
1. MSDS Sheets: The Contractor shall furnish copies of Material Safety Data Sheets to the Owner for all materials classified as hazardous or poisonous. MSDS for all materials shall be maintained with the Contractor in a file on-site.
- I. Indoor Air Quality Management:
1. The Contractor and his various subcontractors as he may direct shall implement procedures throughout construction in an effort to maintain indoor air quality during the construction and Owner's occupancy. See Section 01 57 21- Indoor Air Quality Controls.
  2. The maintenance of a clean, dust-free environment in areas of the site that remain operational or otherwise accessible to non-construction personnel shall be the responsibility of the Contractor to direct all construction personnel.
  3. Control of dust, vapors, odors, noise, and the spread of fire shall be considered of paramount importance. Unless otherwise specifically required by the Owner, the means and methods of achieving such control shall remain the exclusive responsibility of the Contractor, and not the Owner or Architect. However, the following shall be considered:
    - a. Closure of air intake vents, dust collectors, exhaust areas, vehicular access and pedestrian doors. (verify activities with the School prior to interruption or disruption).
- J. Environmental Regulations: The Contractor shall comply with all applicable environmental laws and regulations. Particular attention shall be paid to proper dust, fume, noise, and vapor control throughout the building and site.
- K. Hazardous Substances: The Owner will retain a HAZMAT consultant to address the investigation, discovery, detection, identification, presence, leakage, release, use, handling, disposal, encapsulation, abatement, treatment, or removal of, or exposure of a person or persons to hazardous materials, including but not limited to asbestos or asbestos products, lead, radon, or other materials. Should any such substances be encountered, the Owner and Architect shall be promptly notified, in writing.

- L. Layout and Field Engineering: The Contractor shall be responsible for all layout of all Work, even if such layout is done by sub-contractors. The Contractor shall employ a qualified field engineer or land surveyor to determine all lines and grades and to field verify existing job conditions and measurements indicated on the Drawings. The Contractor's responsibility includes but is not necessarily limited to levels, control points, base lines, on-site bench marks, reference points, siting of improvements, locations of components, fixtures, equipment, finishes, site improvements, etc.
1. The Contractor shall be responsible to submit a certificate signed by land surveyor registered in the State of Maine, hired by the Contractor, certifying that the location of new building lines and location and elevation of improvements comply with the Contract Documents.
  2. The Owner has generally identified on the existing conditions survey, existing topography, utilities, wetlands, control points, and property line corner stakes. Contractor shall confirm all existing control points.
  3. The Contractor shall provide to the Architect written documentation to verify all layout. Include any deviations from the Contract Documents. Do not start any Work affected by such deviations until reviewed by the Architect.
  4. The Contractor shall be responsible for costs of survey work including but not necessarily limited to establishing and protecting on-site benchmarks, replacement or relocation of bench marks, additional base lines or levels, reference points, location of site improvements, verification of existing building dimensions, layout and floor elevations. All discrepancies shall be reported to the Architect for clarification.
  5. The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction. Verify the location and invert elevation at point of connection of sanitary sewer, storm drainage, and water service piping, etc.
  6. The Contractor shall maintain a surveyor's log of control and other survey work. Record deviations from required lines, and level, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
  7. The Contractor shall carefully examine all buildings, sites, and Contract Documents prior to submitting his Bid and satisfy himself as to the conditions under which he must operate to perform the Work. No additional compensation will be made to the Contractor for any error or negligence on his part, nor for discrepancies between actual conditions found at the buildings and sites and as indicated in the Contract Documents, unless such discrepancies are brought to the attention of the Architect by a Bidder or Sub-Bidder, in writing, prior to the opening of Bids.
- M. Protection of Adjoining Property: The Contractor shall provide all shoring, fencing, and other work necessary to support, protect and keep unharmed all walls, footings, floors, roofs, walks, roadways and all other parts of any existing buildings, facilities, site improvements, land forms, trees and plant materials, etc. The Contractor shall hold the Owner and Architect harmless from any such damage due to any operations under this Contract. Any existing work or property damaged or disrupted as a result of this Contract shall be replaced or repaired to match original existing conditions at no additional cost to the Owner.
- N. Utilities: The Contractor shall send proper notices, make all necessary arrangements and perform all other services required for the removal or the care, protection and maintenance of all utilities, including, but not limited to, mail boxes, fire plugs (hydrants), electric, LP gas, water, sewer, alarm, television, telephone, internet, network, and telegraph poles and wires, and all other items of this character above or below the ground, on and around the building site, assuming all responsibility and paying all costs related thereto. Related services to any existing facilities shall not be disrupted without the prior approval of the Owner, and then only to the minimum extent required. The Contractor shall comply with the "Underground Utility Damage Prevention System" by notification to DIG SAFE SYSTEM of intent to excavate near or around any underground utility installations. The Contractor shall call DIG SAFE SYSTEM at least 72



working day hours in advance of starting any such excavation. Communicating through the Architect, the Contractor shall request information from the Owner's IT and Facility Directors to confirm utility connection points and known routes.

- O. Traffic Regulations and Parking: The Contractor shall properly regulate traffic at times when the Work interferes with the normal flow of traffic both on and off the site. Parking for workers on the project shall be limited to areas designated by the Owner or governing officials. Roadways and driveways outside the limits of the Contract shall be kept free of debris resulting from construction related traffic. Streets and paved areas shall be kept clean of all construction related debris and dirt by the Contractor.
- P. Roads and Access to the Site: Access to the site for workers and the delivery or removal of construction materials and equipment shall be made only from locations approved by governing authorities and acceptable to the Owner. Existing roads, lanes and other required fire access shall remain accessible to fire vehicles at all times. Hauling permits and route approvals shall be obtained from governing authorities as applicable.
- Q. Security: The Contractor shall be responsible for the securing of new and existing structures against the entry of unauthorized persons at all times, including nights, holidays and days when the buildings may be unoccupied.
  - 1. When construction related personnel are the last to leave either the new facility or other facilities under construction, they shall verify that the entire work perimeter is properly secured.
  - 2. When non-construction related personnel are the last to leave either the new areas under construction or the existing site, the Contractor shall verify that all unoccupied areas are properly secured, and shall record the names and affiliations of those persons remaining near the work area.
- R. Permanent Fire Protection: The Contractor shall confirm the existing facility's domestic water fire suppression system. New water lines shall be installed and the new system activated in phases; requiring zones and controls to support fully operational areas as well as existing areas to remain in an "as-is" condition until the work can be completed as required.
- S. Dewatering: The Contractor shall protect the Work, including but not limited to all excavations, trenches, buildings and materials from storm water, ground water, back-up or leakage of sewers, drains or other piping, and from water of any other origin and shall control, collect and dispose of any accumulation of such water.
  - 1. Dewatering operations shall include, but not be limited to:
    - a. Furnishing, operating, and maintaining all pumps, piping, drains, and other equipment, including spare units available for immediate use in the event of equipment breakdowns.
    - b. Designing, engineering, constructing, maintaining and removing cofferdams, temporary underdrains, wellpoints and all other systems necessary for dewatering.
    - c. Disposing of all water in a safe and proper manner, acceptable to governing authorities.
  - 2. The Contractor shall pay all costs related to dewatering. All damage resulting from dewatering operations, or the failure of the Contractor to maintain the Work in a suitable dry condition, shall be promptly repaired by the Contractor at no additional cost to the Owner.
- T. Snow Removal: The Contractor shall remove all snow and ice which might result in damage or delay to the Work.
- U. Vandalism: The Contractor shall take all reasonable precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained damage and disappearance of property of the Owner, whether or not forming part of the Work, located within those areas of the Project to which the Contractor has access.
- V. Existing Materials and Equipment: See Section 01 60 00 - Product Requirements.
- W. Shipping and Storage of Materials: See Section 01 60 00 - Product Requirements.

- X. Owner Furnished Equipment: See Section 01 60 00 - Product Requirements.
- Y. Watertight Structure: The Contract Documents are not intended to depict each and every condition or detail of construction. As the knowledgeable party in the field, the Contractor is in the best position to verify that all construction is completed in a manner that will provide a watertight structure during construction (i.e. as needed to keep all interior construction dry both during and following its installation) and upon completion of construction. The Contractor shall be solely responsible for ensuring the watertight integrity of the structure.
- Z. Guarantee: The Contractor shall guarantee the entire Work to be free from defective or improper work or materials, and shall make good any damage due to such work or materials for a term of two years from the date of the satisfactory completion and acceptance of the final phase of the Work. See Section 01 78 10 - Warranties.

### **1.03 MEASUREMENT AND PAYMENT**

- A. Schedule of Values: Submit a preliminary sample of the Schedule of Values for review and comment regarding format and content to the Architect at the earliest feasible date, but in no case later than fourteen (14) days prior to submittal of the first Application for Payment. The Schedule of Values shall clearly identify the cost of the Work by trade, plus all General Conditions and accepted Alternates.
  - 1. Separate Schedules of Values shall be prepared for each phase of the Work.
  - 2. The cost of the Work for major trades shall be further broken down by major systems, components, labor, materials, sub-subcontracts or other appropriate means in sufficient detail to facilitate continued evaluation of project progress.
  - 3. The format and general content of such schedule shall be acceptable to the Owner and Architect.
    - a. Round amount off to the nearest whole dollar; the total shall equal the Contract Sum.
    - b. No later than seven (7) days prior to submittal of the first Application for Payment, the Contractor shall submit to the Architect and Owner, the fully completed Schedule of Values; in a form acceptable to the Owner and Architect.
- B. Payment Requisition: The Contractor shall submit to the Architect three original copies of "Application for Payment", AIA Forms G702 and G703, an itemized statement showing the original Contract Amount, the value of the Work to date, the amount previously approved, the amount presently requested and the balance remaining. Each copy shall be fully executed and properly signed and sealed.
  - 1. Application for Payment entries shall match the Schedule of Values. Include amounts of Change Orders issued prior to the last day of the construction period covered by the application.
  - 2. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
  - 3. Progress payment dates shall be as established elsewhere in the Agreement. The Contractor shall submit a draft of the Application for Payment to the Architect no less than seven (7) days in advance of the due date to allow for preliminary review and adjustments.
  - 4. The Contractor shall clearly differentiate between items stored on-site and items stored off-site. For off-site stored materials, provide invoices, list of materials, insurance certificate, right of entry, transfer of title, and other documents as may be required by the Architect and Owner. The Owner is under no obligation to pay for materials stored off site.
  - 5. Provide any other documents as may be required by the Architect to verify work completed and payment invoiced.
  - 6. Each Application for Payment shall be accompanied by a transmittal listing all attachments.
  - 7. Initial Application for Payment: The following administrative actions and submittals shall precede or coincide with the submittal of the first Application for Payment:
    - a. List of subcontractors, principal suppliers, and fabricators.
    - b. Schedule of Values broken down into sums no greater than Fifty Thousand Dollars (\$50,000.00)



- c. Contractor's CMP Construction Schedule.
  - d. Contractor's Submittal Schedule derived from the CMP Schedule.
  - e. List of Contractor's staff assignments.
  - f. Copies of building permits, authorizations, and licenses from governing authorities.
  - g. Certificates of insurance.
  - h. Data needed to acquire Owner's insurance (if any).
  - i. Initial Progress Report.
  - j. Performance and Payment Bonds.
8. Application for Payment at Substantial Completion: Submit an Application for Payment following issuance of the Certificate of Substantial Completion. The application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work. See AIA 201 General Conditions of the Contract. The following administrative actions and submittals shall precede or coincide with the submittal of this Application for Payment:
- a. Occupancy permits, as applicable.
  - b. Warranties and maintenance agreements.
  - c. Testing / adjusting / balancing / commissioning reports.
  - d. Maintenance instructions.
  - e. Meter readings, as applicable.
  - f. Start-up performance reports.
  - g. Change-over information related to Owner's occupancy, use operation and maintenance.
  - h. Final cleaning.
  - i. Application for reduction of retainage, and consent of surety.
  - j. Advice on shifting insurance coverage.
  - k. List of incomplete Work (punchlist), accompanied by the Architect's Certificate of Substantial Completion.
9. Final Application for Payment: This application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work. See Article regarding Final Payment of the Agreement and AIA 201 General Conditions of the Contract. The following administrative actions and submittals shall precede or coincide with the submittal of the final Application for Payment:
- a. All items required by Article 9 "Payments & Completion" of AIA A201.
  - b. Completion of Project close-out requirements.
  - c. Completion of items specified for completion after Substantial Completion.
  - d. Assurance that unsettled claims will be settled.
  - e. Transmittal of required Project construction records, including Record Drawings to the Owner.
  - f. Proof that taxes, fees and similar obligations have been paid.
  - g. Removal of temporary facilities and services.
  - h. Removal of surplus materials, rubbish, and similar elements.
  - i. Video of all Owner-training sessions
  - j. Final sign-off of Commissioning from Owner's Agent.
- C. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics lien for every entity who is lawfully entitled to file a lien arising out the Contract and related to the Work covered by the Payment. See AIA A201 General Conditions of the Contract.
- 1. The Contractor shall promptly execute a partial waiver of mechanics lien for the period of construction covered by each application. Executed waivers shall be submitted to the Architect with the submittal of the next Application for Payment by the Contractor. With each Application for Payment, submit partial waiver of mechanics liens from subcontractors, or sub-subcontractors and suppliers for the construction period covered by the previous application.
  - 2. When an application shows completion of an item, submit final or full waivers when retainage is released.

3. The Owner reserves the right to designate which entities involved in the Work must submit waivers. It shall be recognized that all trades shall require waivers, and major equipment suppliers.
4. Submit the final Application for Payment with or preceded by final waivers from every entity involved with the performance of the Work covered by the application who could lawfully be entitled to a lien. The total amount of each entity's final waiver of lien shall equal the Contract Sum for that entity including all additions and reductions thereto.
5. Submit waiver of liens on the following forms, and executed in a manner, acceptable to the Owner:
  - a. Partial waiver of liens: Form provided by the Contractor and acceptable to the Architect and Owner.
  - b. Final waiver of liens: AIA G706A Contractor's Affidavit of Payment of Release of Liens or another form acceptable to the Architect and Owner.
- D. Schedule Update: Along with each payment requisition, the Contractor shall submit digital construction photographs and an updated progress schedule showing actual start dates for activities and any adjusted completion dates. Each such monthly update shall summarize the progress of the Work and shall identify:
  1. Areas of the building and site expected to be worked on during the next month.
  2. Special conditions or circumstances that may affect the safe use of the building or site.
  3. Any necessary measures to achieve the phased completion dates, as applicable to the status of the project.

#### **1.04 MODIFICATION PROCEDURES**

- A. Minor Changes to the Work: Supplemental Instructions, authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, may be issued by the Architect.
- B. Owner Initiated Change Order Proposal Requests: The Architect shall issue Proposal Requests that describe proposed changes in the Work that may require adjustment to the Contract Sum. The Architect will provide supplemental sketches or revised Drawings and Specifications as necessary.
  1. Proposal requests are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
  2. Unless otherwise indicated in the proposal request, within seven (7) working days of receipt of the proposal request, the Contractor shall submit to the Architect and Owner for review, an estimate of cost necessary to execute the proposed change. Include an itemization of quantities, unit costs, etc. Include all related charges and a statement indicating if the proposed change will have on the Contract Time; and if so, with information on how the change affects the scheduled critical path.
- C. Contractor Initiated Change Order Proposal Requests: The Contractor may propose changes when latent or other unforeseen conditions require modifications to the Contract, by submitting a request for a change to the Architect.
  1. Provide a complete description of the proposed change. Indicate the reason for the change and the effect of the change on the Work, the Contract Sum and the Contract Time. Include an itemization of quantities, unit costs, etc. and include all related charges. Comply with requirements for "Substitutions".
- D. Allowances: There are no allowances in the Project.
- E. Construction Change Directive: Construction Change Directives, containing descriptions of changes in the Work and designating methods to be followed to determine changes in the Contract Sum or Contract Time may be issued by the Architect.
  1. Unless otherwise directed, maintain detailed records of time and materials related to the Work required by the Construction Change Directive. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.



2. When a Construction Change Directive is issued using an agreed upon price or fixed price the Contractor shall proceed to expeditiously complete the work, whether the Contractor agrees with the price or not.
- F. Change Order Procedures: Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor, in triplicate.

#### **1.05 SUBSTITUTIONS**

- A. Substitutions are changes, modifications or deviations in those products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after the receipt of Bids. Substitutions for the convenience of the Contractor or subcontractors, or materials suppliers will only be considered if submitted prior to the receipt of Bids, in strict conformance with the Instructions to Bidders. The following shall not be considered substitutions:
1. Changes, modifications, or deviations requested by Bidders during the bidding period and accepted in writing prior to the receipt of Bids shall be considered as included in the Contract Documents and are not subject to the requirements of this Section.
  2. Revisions to Contract Documents requested by the Owner or Architect.
  3. Specified options of products or materials included in the Contract Documents.
  4. The Contractor's compliance with governing regulations and orders issued by governing authorities, subject to the Architect's prior written notice and approval.
- B. Substitution Requests: See Section 01 60 00 - Product Requirements, for substitution request procedures.

#### **1.06 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for requirements regarding submission of:
1. Draft CPM Construction Schedule.
  2. CPM Construction Schedule.
  3. Schedule of Materials.
  4. Schedule of Submittals.
  5. Shop Drawings, Product Data and Samples.
  6. Mock-ups and Sample Field Installations.
  7. Requests for Substitution

#### **1.07 ELECTRONIC MEDIA**

- A. Electronic Media: See Section 01 00 30 - Electronic Media, for information regarding obtaining the Contract Documents electronically and their limited use for purposes of project coordination and Contractor's use in the preparation of Record Drawings.

#### **1.08 QUALITY CONTROL**

- A. General: The Owner shall employ an independent testing agency for the purpose of testing and inspecting portions of the Work in progress. The Contractor and his various subcontractors shall be responsible for specific testing and inspections as identified in individual specification sections. See Section 01 40 00 - Quality Requirements

#### **1.09 TEMPORARY FACILITIES**

- A. See Section 01 50 00 - Temporary Facilities and Controls, for information regarding:
1. Field offices and storage containers.
  2. Project signs.
  3. Temporary utilities.
  4. Temporary stairs, hoists, and lifts.
  5. Temporary enclosures and heat.
  6. Sanitary facilities.
  7. Temporary protective covering of finished work.
  8. Temporary protection of existing facilities.
  9. Temporary fencing.
  10. Temporary fire protection.

11. Temporary drainage and storm water control.
12. Temporary parking and roads.
13. Clean-up and waste removal.

#### 1.10 PROJECT MEETINGS

- A. The Contractor shall schedule the following project meetings including but not limited to:
  1. Pre-Construction Meeting.
  2. Pre-Installation Meetings.
  3. Coordination Meetings.
  4. Job Meetings.
  5. Project Close-out Meeting.
  6. Other meetings as necessary.
- B. Pre-Construction Meetings:
  - 1 The Contractor shall conduct an initial organization meeting at the Project site or other convenient location after the Notice to Proceed and prior to commencement of construction activities. The Owner, Architect, Owner's Representative, Contractor, and his Superintendent shall each be represented at the meeting by persons familiar with and authorized to conclude matters related to the Work. The Contractor shall record the minutes of this meeting. The minutes shall be distributed promptly to all participants.
    - A. Agenda items shall include, but not be limited to:
      1. Notice to Proceed
      2. Designation of personnel representing the parties and their responsibilities.
      3. Contract Documents: on-site documents, contractor logistic plan(s), interpretations and clarifications.
      4. Subcontractors
      5. Schedule of Values
      6. Insurance requirements.
      7. Application for Payment: progress payments, Substantial Completion, off-site stored materials.
      8. Project meeting(s) scheduling
      9. Layout activities
      10. Scheduling: Construction schedule, working hours, overtime, holidays.
      11. Permits and regulations
      12. Testing and inspections.
      13. Submittals: schedule, process, shop drawings, samples, record documents.
      14. Substitution process
      15. Change process.
      16. Job responsibilities: Superintendent, Owner's Representative.
      17. Temporary facilities: parking, staging areas, site security, water, power, heat, clean-up
      18. Job safety.
  - 2 The Contractor shall conduct an Authority Having Jurisdiction (AHJ) informational meeting at the Project site or other convenient location after the Notice to Proceed and prior to commencement of construction activities. The Owner, Architect, Owner's Representative, Contractor, and his Superintendent shall each be represented at the meeting. The agenda is to review the construction logistics and provide a forum to review the AHJ process and concerns. The City planner, code enforcement officer, fire department, police department, and other agencies will be present. The Contractor shall record the minutes of this meeting. The minutes shall be distributed promptly to the Owner and Architect.
- C. Pre-Installation Meetings: The Contractor shall conduct pre-installation meetings before each major construction activity that requires coordination is begun. Attendees may include the Contractor, Superintendent, Owner's Representative, Architect, Installers, Manufacturer's representatives, and fabricators. Refer to individual Specification Sections for required pre-



installation meetings. Review progress of other construction activities and preparation for the particular activity under consideration.

- D. Coordination Meetings: The Contractor shall conduct coordination meetings at regularly scheduled times convenient to all parties. All major subcontractors shall be represented and other trades or subcontractors as required for coordination, planning and scheduling construction activities. The Contractor shall bring any significant issues to the next Job Meeting.
- E. Job Meetings: The Contractor shall conduct regular job meetings once every week or two weeks, depending on the progress of the Work, at such time as is mutually acceptable to the Owner, Architect and Contractor. Subcontractors may be called to a particular job meetings as the progress of the Work requires review of a specific agenda topic. The Contractor shall record the minutes of each meeting. The minutes shall be distributed promptly to all participants.
  - 1. Agenda items shall include, but not be limited to:
    - a. Review construction progress since the last meeting.
    - b. Review work progress in relation to the Construction Schedule.
    - c. Review “Old Business” and new items significant to the Work.
    - d. Review issues regarding construction activities and Owner’s on-going activities.
    - e. Review work sequence, logistics, mock-ups, product samples, housekeeping matters, job site security, field observations, and quality assurance.
    - f. Review Change Orders, Proposal Requests, Requests for Information, Supplemental Instructions.
    - g. The Contractor will distribute an updated Construction Schedule once per month with the draft application for payment.

F. Project Close-out Meeting: See Section 01 78 00 - Project Close-out.

#### **1.11 WARRANTIES**

A. See Section 01 78 10 - Warranties.

#### **1.12 PROJECT CLOSE-OUT**

- A. See Section 01 78 00 - Project Close-out, for requirements regarding:
  - 1. Substantial Completion procedures, including Project Close-out Meeting and Occupancy Permit.
  - 2. Architect’s evaluation of the Work.
  - 3. Final Acceptance procedures.
  - 4. Project record documents submittal, including O&M manuals, warranties binder, record photographs, commissioning report(s) and record drawings.
  - 5. Spare parts and extra materials procedures.
  - 6. Indoor Air Quality Management, building commissioning and systems testing.
  - 7. Operating and maintenance instructional sessions.
  - 8. Final cleaning.
  - 9. Contractor’s Certificate of No Hazardous Materials.
- B. Occupation by the Owner: The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding the fact that the time for completing the entire Work or such portions thereof may not have expired; but such possession and use shall not be an acceptance of the Work.

#### **1.13 TIME FOR COMPLETION**

- A. Time is of the essence of the Contract, and the Work to be performed under the Contract shall be commenced on or before **August 15, 2017**, and shall be Substantially Complete and in receipt of an Occupancy Permit for the new school building on or before **May 15, 2019**.
  - 1. The Owner intends to move-in educational and operational equipment, furniture, and fixtures starting **May 15, 2019**.
  - 2. The existing building demolition shall commence on or after **June 20, 2019**, and shall be Substantially Complete, including new parking areas and landscaping, for receipt of an Occupancy Permit for the Complete Work on or before **August 15, 2019**.

3. The geothermal system well field (alternate 1), if accepted, shall commence on or after **June 20, 2018**, and shall be Substantially Complete, including installed temporary parking areas, to avoid school access and parking lot disruption on or before **August 30, 2018**
- B. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the Work described herein is reasonable for the completion of same, taking into consideration the climatic and industrial conditions prevailing in this locality.

**END OF SECTION**



**SECTION 01 00 30  
ELECTRONIC MEDIA****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. The provisions of this Section apply to each and every contract and contractor or other person or persons supplying labor, material, equipment and/or services entering into this Project and/or on the premises directly or indirectly.
- B. Following the receipt of a written request by the Contractor, signed Electronic Data Transfer and Non-Disclosure Agreement, and if applicable, payment in full from the Contractor, the Architect will make available an electronic data version of the Project, for the limited purposes described in this Agreement. It shall be the Contractor's responsibility to make electronic files available to subcontractors in accordance with the Electronic Data Transfer and Non-Disclosure Agreement.

**ELECTRONIC DATA TRANSFER AND NON-DISCLOSURE AGREEMENT**

The Agreement is entered into and agreed by, between and among Lavallee Brensinger Professional Association (LBA), and \_\_\_\_\_ (Recipient) and is made in reference to the Mid-Coast School of Technology – Region 8 Project in Rockland, Maine. It is understood and agreed that it may become desirable for LBA to make certain Instruments of Service in electronic machine readable format, hereinafter referred to as "Electronic Data" available to other parties related to the Project. It is also understood that such information is proprietary to LBA and that LBA intends to limit its distribution and use. It is the intent of the Agreement to govern all circumstances under which Electronic Data is made available by LBA.

In consideration of the request of \_\_\_\_\_ (Recipient) to LBA to deliver to Recipient or otherwise enable the Recipient to access certain Electronic Data for use on the Project, the parties mutually agree as follows:

1. Electronic Data includes computer-aided design files including native file formats (DWG) and Building Information Models (BIM). Computer-Aided-Design files shall be provided as Autocad.dwg files. Building Information Models shall be provided as Revit.rvt files.
2. The means by which the Electronic Data is transferred may include, but are not limited to, electronic mail and File Transfer Protocol sites, transmitted between the parties in this Agreement. Recipient acknowledges that Electronic Data transferred in any manner or translated from the system and format used by LBA to an alternate system or format is subject to errors that may affect the accuracy and reliability of the data and that the data may be altered, whether inadvertently or otherwise. Accordingly, LBA makes no warranty, express or implied, as to the correctness, accuracy, and/or completeness of the information transferred. Although LBA may issue information throughout the development of the Project, LBA does not represent that the information provided includes all revisions to-date, nor shall LBA assume any responsibility for providing updated information as the Project proceeds.
3. LBA reserves the right to retain hard copy originals in addition to electronic copies of the Electronic Data transferred, which originals shall be referred to and shall govern in the event of any inconsistency with the transferred data. Should the recipient discover errors or conflicts in any transferred files, he shall promptly notify LBA.

4. As consideration to LBA for the transfer of the Electronic Data, Recipient agrees that the use of Electronic Data shall be entirely at his/her own risk, and that LBA shall not be liable for, and Recipient hereby waives all claims and agrees to indemnify and hold LBA harmless from all liabilities, claims, losses, damages or expenses (including attorneys' fees) arising out of, or connected with: (1) the transfer of Electronic Data by any means; or (2) the use, modification or misuse of the Electronic Data by parties other than LBA; or (3) the limited life expectancy and decline of accuracy or readability of the Electronic Data due to storage; or (4) translation and data errors; or (5) any use of the Electronic Data by any third parties receiving the data from other parties to this Agreement; or (6) the incompatibility of software or hardware used by LBA and the other parties to this Agreement.

**5. The Electronic Data provided by LBA under the terms of this Agreement is the proprietary information of LBA, containing designs, details, model elements and other information developed by LBA. LBA is willing to supply such information only if the Recipient enters into this Non-Disclosure Agreement and agrees to strictly enforce its terms and conditions. All Electronic Data is to be treated as confidential and is not to be disclosed to or shared with any third parties, not expressly allowed herein, without LBA's express, written consent.**

6. Recipient agrees to maintain and protect any and all proprietary information of LBA and to exercise great care in the preservation of its confidentiality. The Recipient will disclose the proprietary information only to its own employees, and then only to the extent required for the design and construction of this Project. The Recipient shall be responsible for any unauthorized use or disclosure of LBA's proprietary information by anyone to whom it may disclose such information.

7. The Recipient agrees that any and all Electronic Data shall remain the property of LBA. Neither the execution of this Agreement, nor the transfer of Electronic Data shall constitute a conveyance or transfer to the Recipient of any right, interest, or license in the proprietary materials. The Recipient shall not reproduce any proprietary information without the express written authorization of LBA.

8. Electronic Data are provided as a convenience to the Recipient for informational purposes only in connection with the Recipient's performance of its responsibilities and obligations relating to the Project. The Electronic Data do not replace or supplement the paper copies of the Drawings and Specifications which are and remain, the Contract Documents for the Project.

**9. Electronic Data shall only be used for purposes allowable by this Agreement. It is understood and agreed that, without the separate express written permission of LBA to do so, the Electronic Data are not to be used for any purpose whatsoever, by anyone (any contractor or any of its subcontractors of any tier or any materials supplier or vendor) other than the Recipient. It shall be the responsibility of the Recipient to notify LBA of any and all third parties with whom the Recipient wishes to share LBA's Electronic Data, to identify the intended uses of the information, and to obtain LBA's prior written authorization to share LBA's information.**

10. All transmittal of Electronic Data whether by e-mail, Internet, or any other methods shall require that the file name, size, date and time be recorded along with the date and time of transmission (if by electronic means) and the identity of the sender and recipient.

11. The Recipient further agrees to indemnify and save harmless LBA and its sub-consultant and each of their partners, officers, shareholders, directors and employees



from any and all claims, judgments, suits, liabilities, damages, costs or expenses (including reasonable defense and attorneys' fees) arising as the result of either:

- a) Recipient's failure to comply with any of the requirements of the Electronic Data Transfer Agreement; or
- b) a defect, error or omission in the Electronic Data or the information contained therein, which defect error or omission was not contained in the Contact Documents as defined in paragraph 3 or where the use of such Contact Documents would have prevented the claim, judgment, suit, liability, damage, cost or expense.

12. This agreement shall be interpreted under the laws of the State of Maine. The Recipient hereby agrees that the breach of this Agreement by the Recipient will cause LBA considerable harm, and LBA shall be entitled to recover damages, as well as all expenses and costs incurred by LBA arising out of or related to such breach, including, without limitation, reasonable attorney's fees and costs.

13. In general, the protocols for the distribution of Electronic Data shall be as follows:

- a. LBA may make certain Electronic Data available to \_\_\_\_\_ (Owner or General Contractor) free of charge, providing that:
  - 1) Such files can be issued in the format currently used by LBA, without modification.
  - 2) The Recipient delivers to LBA a fully executed copy of this Agreement and, among other requirements, agrees not to share LBA's Electronic Data with any third parties without LBA's prior written authorization.
- b. In the event the Recipient wishes to share LBA's Electronic Data with a third party:
  - 1) The Recipient shall first forward a complete list of all such third parties to LBA for LBA's prior written authorization. The list shall include all third party names, addresses, telephone numbers, and email addresses.
  - 2) Each individual third party shall then deliver, through the Recipient, a fully executed copy of this Agreement.
- c. In the event that it is necessary for LBA to convert files from its currently used format of Revit (BIM) to an alternative format, LBA shall be compensated for such conversion at the rate of \$75.00 per file, payable in advance.

The parties have executed this Agreement as of the dates stated below:

**RECIPIENT** \_\_\_\_\_  
(Company)

By: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

**LBA**

By: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

**END OF SECTION**

**SECTION 01 22 00**  
**UNIT PRICES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment.
- C. Defect assessment and non-payment for rejected work.

**1.02 COSTS INCLUDED**

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

**1.03 UNIT QUANTITIES SPECIFIED**

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

**1.04 MEASUREMENT OF QUANTITIES**

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the greater detailed requirements between the individual specification section and this section shall govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be reviewed by Architect.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement by Weight: Actual weights shall be provided by the Contractor for payment.
- E. Measurement by Volume: Measured by cubic dimension; length, width and height or thickness.
- F. Measurement by Area: Measured by square dimension using mean length and width or radius.
- G. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- H. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- I. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- J. Contractor's Engineer Responsibilities: Provide signed surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes. All measurements and quantities shall be verified by Owner's testing agency or design team and Clerk of the Works / Project Coordinator.
- K. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured, at the Owner's expense, by an independent surveyor.

**1.05 PAYMENT**

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect and Owner, multiplied by the unit price.
- B. Payment will not be made for any of the following:
  - 1. Products wasted or disposed of in a manner that is not acceptable.
  - 2. Products determined as unacceptable before or after placement.
  - 3. Products not completely unloaded from the transporting vehicle.
  - 4. Products placed beyond the lines and levels of the required Work.



5. Products remaining on hand after completion of the Work.
  6. Loading, hauling, and disposing of rejected Products.
  7. Work that can be reasonably inferred from the Contract Documents or in the Owner's Geotechnical Report, existing condition surveys, or existing condition documents.
- C. The decision as to whether or not to use the unit prices provided by the Contractor or employ some alternative method of compensation for changes in scope shall be at the sole discretion of the Owner, and the Owner's decision shall be considered final.

**1.06 DEFECT ASSESSMENT**

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Architect and Owner, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:
1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect and Owner.
  2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect and Owner.
- C. The authority of Architect to assess the defect and identify payment adjustment is final.

**1.07 SCHEDULE OF UNIT PRICES – See Bid Form**

- A. Item 1: Alternate 1: Geothermal Dewatering. Set-up water control measures for frac tanks / weir tanks if contract required site water control measures cannot control well water production (as agreed by geothermal engineer): \$ / per day cost.
- B. Item 2: Misc Items:
- a. White Board (10ftx5ft board) to furnish and install specified product.
- C. Item 3: Electrical Devices:
- a. Power outlet wired to nearest power source: \$ / per completed device
  - b. Power outlet wired to nearest panel include 20AMP breaker: \$ / per completed device
  - c. Power outlet wired to nearest panel include 50AMP breaker: \$ / per completed device
  - d. IT / AV / Communication outlet wired to associated patch panel location: \$/per completed device.

**END OF SECTION**

**SECTION 01 23 00  
ALTERNATES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Description of alternates.
- B. The Contractor shall provide all labor, materials, equipment, and services, etc., necessary for the proper and complete execution of accepted Alternates. Amount of Alternate prices to be added to or deducted from the Base Bid shall be stated on the Proposal Form and shall include cost of any and all modifications made necessary by Owner's acceptance of Alternates.
- C. Related Work Described Elsewhere:
  - 1. Materials and methods to be used in the Base Bid, and in the Alternates, are generally described in the Contract Documents.
  - 2. Method for stating the proposed Contract Sum is described in the Proposal Form.
- D. NOTE: Alternates will be carefully considered in the Owner's selection of a Contractor.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 21 13 - Instructions to Sub-bidders: Instructions for preparation of pricing for alternatives.
- B. Section 01 22 00 – Unit Prices: Dewatering of geothermal systems.
- C. Division 23: Geothermal systems.

**1.03 ACCEPTANCE OF ALTERNATES**

- A. If the Owner elects to proceed on the basis of one or more of the described Alternates, make all modifications to the Work required in order to furnish and install the selected Alternate or Alternates to the approval of the Architect and at no additional cost to the Owner, other than as proposed on the Proposal Form.
- B. After award of the Contract, or as soon thereafter as the Owner has made a decision on which, if any, Alternates will be selected, thoroughly and clearly advise all necessary personnel and suppliers as to the nature and extent of Alternates selected by the Owner. Use all means necessary to alert those personnel and suppliers involved as to all changes in the Work caused by the Owner's selection or rejection of Alternates.
- C. It shall be the responsibility of the Contractor to properly coordinate work related to Alternates with all other Work of this Contract in order to ensure that a complete and proper job is provided. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- D. Submit a Schedule of Values including adjustments to all Sections affected by accepted Alternates.
- E. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.
- F. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

**1.04 SCHEDULE OF ALTERNATES**

- A. Alternate No 1: Geothermal System

**END OF SECTION**



**SECTION 01 30 00**  
**ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Preconstruction meetings.
- B. Site mobilization meeting.
- C. Job meetings.
- D. Construction reports.
- E. Materials Schedule.
- F. Submittal Schedule.
- G. Progress photographs.
- H. Coordination Drawings.
- I. Shop Drawings.
- J. Approval Drawings.
- K. Product Data, Certifications, Delegated-Design Submittals
- L. Submittals for review, information, and project closeout.
- M. Submittal procedures.
- N. Architect's Review

**1.02 RELATED REQUIREMENTS**

- A. Section 01 00 00 - General Requirements.
- B. Section 01 78 10 - Warranties.
- C. Section 01 78 00 - Project Close-out: Project record documents.

**1.03 PROJECT COORDINATION**

- A. Contractor is responsible all Project Coordination among and between all trades. Any request to sub-contract this responsibility shall be made in writing during the initial bid process. Request shall include submission of the Project Coordination Sub-contractor's qualifications as a General Contractor or Construction Manager with at least ten (10) years' experience in coordinating the implementation and installation of all trades and activities associated with this Work. Upon receipt of such request and submissions the Owner and Architect shall review. At the Owner's reasonable discretion, the Owner will either accept or reject the use of a Project Coordination Sub-contractor. Where rejected the Contractor shall remain responsible for the Project Coordination for all trades.
- B. Contractor shall coordinate the allocation of mobilization areas of site; for field offices and storage containers, for delivery access, traffic, and parking facilities.
- C. During construction, all use of site and facilities shall be coordinated through the Contractor.
- D. All those involved in the Work shall comply with Contractor's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Contractor shall instruct all use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work under instructions of the Contractor.
- G. Make the following types of submittals to Architect through the Contractor
  - 1. Requests for interpretation (RFI).
  - 2. Requests for substitution.

3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Manufacturer's instructions and field reports.
6. Applications for payment and change order requests.
7. Progress schedules.
8. Coordination drawings.
9. Closeout submittals.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 PRECONSTRUCTION MEETING**

- A. See Section 01 00 00 General Requirements, for Pre-construction Meeting.

### **3.02 SITE MOBILIZATION MEETING**

- A. The Owner shall schedule a meeting at the Project site prior to the Contractor's mobilization.
- B. Attendance Required:
  1. Contractor.
  2. Owner.
  3. Architect.
  4. Contractor's Superintendent.
- C. Agenda:
  1. Execution of Owner- Contractor Agreement.
  2. Submission of executed bonds and insurance certificates.
  3. Submission of list of Subcontractors, list of major Products and Systems, schedule of values, and initial 60-day construction schedule.
  4. Procedures and processing measures of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
  5. Use of premises by Owner and Contractor.
  6. Owner's requirements and occupancy prior to completion.
  7. Construction facilities and controls provided by Owner.
  8. Temporary utilities provided by Owner.
  9. Survey and building layout.
  10. Security and housekeeping procedures.
  11. Schedules, timelines, and milestones.
  12. Application for payment procedures.
  13. Scope and procedures for testing and inspections. Review of Statement of Special Inspections and Testing Agency duties.
  14. Scheduling activities of the Geotechnical Engineer and Testing Agency.
  15. Procedures for maintaining record documents.
  16. Requirements for start-up of equipment and commissioning.
  17. Inspection and acceptance of equipment put into service during construction period.
- D. Contractor shall 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 JOB MEETINGS**

- A. See Section 01 00 00 General Requirements, for Job Meetings.



**3.04 CONSTRUCTION REPORTS**

- A. The Contractor's superintendent shall maintain an on-site daily construction log, recording the following information concerning events at the site and allow access to the Owner and Architect for review.
  - 1. List of subcontractors at the site.
  - 2. Approximate count of personnel at the site; for each trade.
  - 3. Visitors at the site.
  - 4. High and low temperatures, general weather conditions.
  - 5. Accidents and unusual events.
  - 6. Meetings held at the site.
  - 7. Communications received or conveyed by the superintendent that affect the Owner.
  - 8. Stoppages, delays, shortage, losses.
  - 9. Meter readings and similar recordings.
  - 10. Emergency procedures.
  - 11. Orders and requests of governing authorities.
  - 12. Testing agency observations and tests.
  - 13. Change orders received and implemented.
  - 14. Services connected, disconnected.
  - 15. Significant deliveries.
  - 16. Equipment or system tests and start-ups.
  - 17. Partial completions, occupancies.
  - 18. Substantial Completions authorized.

**3.05 CONSTRUCTION PROGRESS SCHEDULE**

- A. Within 10 days after date of the Agreement, and prior to Mobilization, 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 CPM schedule for review. All significant construction activities shall be represented. Time duration shall be in weekly increments. Provide specific scheduling for each phase. Schedules shall be coordinated with Owner's on-going occupancy of the site.
  - 1. Include written certification that major contractors have reviewed and accepted the Contractor's proposed schedule.
  - 2. Include Critical Path Method Schedule with defined critical path of activities to demonstrate an orderly progress to meet phasing and construction milestones and completion dates.
  - 3. CPM schedule shall not change the critical activities or duration times after the schedule has been accepted by the Owner.
  - 4. Submittals and the submittal schedule shall become part of the CPM Project Schedule.
  - 5. Owner's Activities shall also be referenced within the CPM Project Schedule.
  - 6. Activity durations shall include early Start and early Finish dates; actual Start and actual Finish dates; Duration days and Float days (for non-critical activities).
  - 7. All construction activities shall be included in the schedule.
- D. Within 10 days after joint review, submit complete CPM schedule.
- E. Submit updated schedule showing actual progression start and finish dates with each Application for Payment.

**3.06 CONTRACTOR'S SCHEDULE OF MATERIALS**

- A. Within twenty-one (21) days after date established for the Commencement of the Work, prepare and submit to the Architect a projected schedule for material delivery, clearly identifying all products with long lead times or which are likely to cause delay due to unavailability, or any other reason. Once identified, long lead time items shall be expedited within the submittal

schedule and ordered in a timely manner as not to delay the progress of the Work. The Contractor shall assume full responsibility for delays attributed to unavailability, insufficient time for delivery and installation of materials or performance of the Work, unless he has conformed to these instructions to identify and expedite the product(s).

### **3.07 CONTRACTOR'S SUBMITTAL SCHEDULE**

- A. Within ten (10) days after development and acceptance of the Contractor's Construction Schedule, prepare and submit to the Architect a complete schedule of submittals. Coordinate schedule with subcontractors and provide adequate time for review, processing, and the possibility of non-acceptance and resubmission. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of ordering materials or performance of the Work to permit processing. Update schedule as necessary.

### **3.08 PROGRESS PHOTOGRAPHS**

- A. Prior to starting construction, submit electronic copies of a clearly labeled CDs, pre-construction video documenting conditions inside and outside of the existing building to remain, site structures and site improvements. Prior to start of any rock removal activities, neighboring structures shall be documented photographically. See Section 31 23 16.23.
- B. Submit a minimum of 30 digital photographs in electronic format, with each Application For Payment, taken not more than 7 days prior to submission of Application For Payment.
  - 1. Identify project name, date and time, description of view and key plan of location if needed.
- C. Maintain one set of all photographs at Project site for reference; same copies as submitted, identified as such.
- D. Select locations to provide diversified overall views of the Work, from positions that are expected to remain accessible throughout the progress of the Work. When so directed by the Architect, change locations to new locations inside or outside the building.
- E. Provide auxiliary lighting as required to produce clear, well lit photographs without obscuring shadows. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion
- F. Photography Type: Digital; electronic files.
- G. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Architect.
- H. 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.
  - 5. Final completion, minimum of 30 photos.
- I. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
  - 1. Delivery Medium: On photo CD, flash drive, or by e-mail.
  - 2. File Naming: Include project identification, date and time of view, and view identification.
  - 3. Photo CD(s): Provide 1 copy including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.

### **3.09 SHOP DRAWINGS**

- A. Shop Drawings: Shop drawings include fabrication and installation drawings, coordination drawings, setting diagrams, schedules, patterns, templates, and similar drawings specially prepared for the Work by the Contractor, subcontractors, manufacturers, fabricators, suppliers or distributors to illustrate some portion of the Work.

1. Shop drawings shall show the design, dimensions, connections, and other details necessary to ensure the accurate interpretation of the Contract Documents and shall show adjoining Work in such detail as required to provide for proper connection to same. Where adjoining Work requires shop drawings, they shall be submitted concurrently for a coordinated review.
2. Submit information specifically prepared for this Project, drawn to accurate scale. Do not reproduce Construction Documents or copy standard information as the basis for shop drawings. Standard information prepared without specific reference to the Project is not considered a shop drawing. Clearly and specifically indicate deviations from the Contract Documents.
3. In addition to the above, include the following information:
  - a. Dimensions and notation of dimensions established by field measurements.
  - b. Identification of products and materials included.
  - c. Compliance with specified standards.
  - d. Notation of coordination requirements and specific procedures.
  - e. Utility connections for equipment.
  - f. Identification of any change, variance or non-conformance with requirements of Contract Documents. Indicate with a "cloud" and provide detailed notation including reason for each change. Include completed "Contractor's Substitution Request" (See Section 01 60 00).
  - g. Indication by the Contractor that submittals have been reviewed, coordinated (checked for dimension, quantity, relationship with work of all trades involved and is in accordance with the Contract requirements), and the Contractor has approved the Shop Drawing for proper installation as required by the Documents and is complete for submittal to the Architect.
4. Electronic Media: See Section 01 00 30 - Electronic Media, for information regarding obtaining electronic documents and their limited use for purposes of project coordination and the Contractor's use in the preparation of submittals.
  - a. Unless express written permission of the Architect is granted, electronic documents provided by the Architect and his consultants, shall not be used by the Contractor, or any of his subcontractors of any tier or any materials supplier or vendor as a shop drawing or any other type of submittal or as the basis for preparing such shop drawing or submittal, with the sole exception to this prohibition being that electronic documents may be used as backgrounds upon which to prepare shop drawings or other submittals.

### **3.10 COORDINATION DRAWINGS**

- A. Coordination Drawings are installation drawings prepared by the Contractor and various trades to show the relationship and integration of different construction elements that require coordination during fabrication or installation to fit in the space provided or to function as intended.
  1. The Contractor shall arrange coordination meetings and require attendance of each (major) subcontractor in order to establish priorities for systems installation, to establish systems installation sequences, to determine and resolve potential conflicts, and to ensure that each trade has coordinated its work with the others and will honor commitments to other disciplines.
  2. Each subcontractor's representative shall sign the final coordination drawings, prior to submission for Architect's review, certifying they have coordinated each building system, resolved all potential conflicts between each trade's work, and have satisfied the intent of each disciplines design.
  3. Where potential conflicts cannot be resolved without input from, or review by, the Architect, the Contractor shall request said input/review, in writing, and provide all sketches, details, part plans, etc. necessary to convey fully the essence of the situation and/or potential conflict. The Contractor and all appropriate subcontractors shall make



themselves available to meet with the Architect as required to resolve the issue(s) in question.

4. Coordination Drawings shall be required for all building structure, ductwork, piping systems, fixtures, and equipment.
5. See Section 01 00 00 General Requirements for more information and requirements.

### **3.11 APPROVAL DRAWINGS**

- A. Whenever the Contractor or subcontractor is required to submit Shop Drawings and/or Product Data to the Authority Having Jurisdiction over the Project for review and approval of a particular component or system, the Contractor shall submit to the Architect for initial review and comment prior to submission to the AHJ.
- B. Prior to starting on-site work, the Contractor shall submit to the Architect copies of the AHJ-approved documents including the authority stamp and approving signature. Submit as "For Information Only".

### **3.12 RECORD DRAWINGS**

- A. Record Drawings: See Section 01 78 00 - Project Close-out.

### **3.13 PRODUCT DATA**

- A. Compile Product Data into a single submittal for each element of construction or complete system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, materials test reports, color charts, roughing-in diagrams, templates, and wiring diagrams. Mark each copy to show applicable choices and options.
  1. Identify any change, variance, or non-conformance with requirements of Contract Documents with a "cloud" and provide detailed notation including reason for each change. Provide a completed "Contractor's Substitution Request". See Section 01 60 00.

### **3.14 CERTIFICATIONS**

- A. Certifications from manufacturers and/or installers required in individual Specification Sections shall be submitted with Product Data.
  1. In accordance with Supplementary General Conditions, Article 3, prior to Substantial Completion, the Contractor shall submit a written certificate that no asbestos and/or other hazardous substances have been incorporated into the Work of this Project.
  2. Contractor's Asbestos/Hazardous Material Certification with the following language:
    - a. I, \_\_\_\_\_ the undersigned representing (company), do hereby certify that the products furnished and/or fabricated and/or installed by my firm under contract with (G.C.) at the Mid-Coast School of Technology – Region 8, located in Rockland, Maine do not contain asbestos and/or other hazardous materials.
    - b. Provide signature, title and date.
    - c. The form of certificate shall be submitted to the Architect for review prior to use.

### **3.15 DELEGATED-DESIGN SUBMITTALS**

- A. Where professional engineering services or certifications by a professional engineer are specifically required to be provided by the Contractor, provide products and systems complying with specific performance and design criteria indicated.
  1. If criteria indicated are not sufficient to perform services or certifications required, submit a written request for additional information to the Architect.
  2. In addition to Shop Drawings, Product Data, and other required submittals, submit a certification, signed and sealed by the responsible professional engineer, licensed in the State of Maine, for each product and system specifically assigned to the Contractor to be engineered or certified by a professional engineer, indicating that the products and systems are in compliance with performance and design criteria indicated. Include a list of codes, loads, and other factors used in performing these services.

### **3.16 SUBMITTALS FOR REVIEW**

- A. When the following are specified in individual sections, submit for review:

1. Product data.
  2. Shop drawings.
  3. Samples for selection.
  4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, quality, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below.

### **3.17 SUBMITTALS FOR INFORMATION**

- A. When the following are specified in individual Sections, submit for information:
1. Design data.
  2. Certificates.
  3. Test reports.
  4. Inspection reports.
  5. Manufacturer's instructions.
  6. Manufacturer's field reports.
  7. Other types indicated.
- B. Submit for Architect's record.

### **3.18 SUBMITTALS FOR PROJECT CLOSEOUT**

- A. When the following are specified in individual Sections, submit them at project closeout:
1. Project record documents.
  2. Operation and maintenance data.
  3. Warranties.
  4. Bonds.
  5. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

### **3.19 NUMBER OF COPIES OF SUBMITTALS**

- A. Documents for Review: Submittals to the Architect shall be electronic files in PDF format, unlocked, markable and reproducible. In addition to electronic files, the following types of submittals shall also be submitted in hard copy, quantity indicated:
1. Steel rebar (2).
  2. Structural steel, joist and deck (2).
  3. Windows, Storefront, Doors and Frames (1).
  4. Door hardware (1).
  5. Millwork and casework (1).
  6. Sprinkler shop drawings (2).
  7. Fire alarm shop drawings (2).
  8. Small Size Sheets, Not Larger Than 11 x 17 inches.
  9. Large Size Sheets, Not Larger Than 30 x 42 inches.
- B. Documents for Information: Submit three copies.
- C. Samples: Confirm with the Architect the number of samples required for each submittal; one of which will be retained by Architect.
1. After review, produce duplicates.
  2. Retained samples will not be returned to Contractor unless specifically so stated.

### **3.20 SUBMITTAL PROCEDURES**

- A. Transmit each submittal with an approved form.

- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Submittal form shall include identification information: Project name, Contractor, Subcontractor or supplier; product name, pertinent drawing and detail number, and specification section number, submittal category, date, and total number of pages in the submittal.
- D. Contractor's Action and Certification: The Contractor shall review each submittal, check for compliance with the Contract Documents, note corrections, note field dimension, and complete a review stamp with the following information:
  - 1. Contractor stamp, signed or initialed certifying that the submittal conforms to requirements of the Contract Documents in accordance with AIA A201, Paragraph 3.12.; or, Submittal deviates from requirements of the Contract Documents, with deviations clearly noted and marked with Contractor's initials; or, Contractor's substitution requested.
- E. Deliver submittals to Architect at business address. Submittals may only be sent directly to the Architect's consultants by special arrangement with the Architect. Subcontractors shall not directly send submittals to the Architect or Architect's consultants.
- F. Submittals of poor legibility may be returned without action for re-submission.
- G. Submittals not including a completed Contractor's Certification Stamp will be returned without action for review by the Contractor and re-submission.
- H. Submittals certified as in conformance by the Contractor and found to deviate from requirements of the Contract Documents will be returned without action for re-review by the Contractor and re-submission.
- I. The Contractor may require sub-contractors to submit similar certification, however this shall not in any way relieve the Contractor of responsibility for review and certification of all submittals.
- J. All notations made on submittals by the Contractor, sub-contractors, suppliers, or fabricators shall be made in bold line type and initialed by person making the notations. Clearly indicate specified items with a "cloud" or arrows. Cross out all extraneous information not intended as part of the submission. Do NOT use highlighter or colored markings, only arrows, circles, text and the like that can be copied in black and white shall be allowed.
- K. Provide a detailed notation of all deviations from the Contract Document requirements including minor variations and limitations, and the reason for each deviation. Include a Contractor's Substitution Request.
- L. Contractor's Substitution Request: All requests for substitutions shall be submitted on the form included at the end of Section 01 60 00.
- M. Schedule submittals to expedite the Project, and coordinate submission of related items.
- N. For each submittal for review, allow 15 working days excluding delivery time to and from the Contractor.
- O. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- P. Provide space for Contractor approval and Architect review stamps.
- Q. When revised for resubmission, identify all changes made since previous submission.
- R. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- S. Submittals not required will not be recognized or processed.
- T. Do not order materials or proceed with the Work requiring submission and review of Product Data, Shop Drawings, Samples or similar submittals prior to receiving acceptance of the submittal from the Architect.



- U. The Contractor shall not use or take submittals on-site without the Architect's or the Architect's consultant's Submittal Stamp indicating acceptance. Submittals without this stamp or with a stamp indicating non-acceptance shall not be used in connection with construction.

### **3.21 ARCHITECT'S REVIEW**

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal and mark to indicate action taken.
  - 1. In general, the Architect will strive to complete his review of submittals and return them to the Contractor in approximately two (2) weeks. Additional time may be required if large volumes of submittals are simultaneously delivered to the Architect for review. Large volumes of submittals shall be prioritized by the Contractor, identifying the order in which submittals need to be reviewed. Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow three (3) weeks for initial review of each submittal.
  - 2. The Architect will not review submittals of colors and finishes until submittals for all such related materials are complete and delivered for collective review. This same requirement may be extended to other components and systems as deemed appropriate by the Architect.
  - 3. The Architect's review shall, among other limitations, not include the calculation, coordination, or verification of dimensions or quantities, which shall be the sole responsibility of the Contractor.
  - 4. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows to indicate the action taken:
    - a. Where submittals are marked "No Exceptions Taken", that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents.
    - b. Where submittals are marked "Note Markings" or "Comments Attached" or "Revise and Resubmit Record Copy", that part of the Work covered by the submittal may proceed provided it complies with markings / comments and requirements of the Contract Documents.
    - c. Where submittals are marked "Revise and Resubmit for Further Review", do not proceed with that part of the Work covered by the submittal including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat as necessary to obtain a different action mark.
    - d. When the submittal is marked "Rejected", do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Do not resubmit that product.
- B. Other Action: Where a submittal is primarily for record purposes, the submittal will be returned marked "Received and Distributed for Record Only". Where a submittal cannot be reviewed due to lack of Contractor review or illegibility, for example, the submittal will be returned marked "Revise and Resubmit for Further Review".

**END OF SECTION**

**SECTION 01 35 43  
ENVIRONMENTAL PROCEDURES****PART 1 - GENERAL****1.1 DEFINITIONS OF CONTAMINANTS**

- A. Sediment: Soil and other debris that has been eroded and transported by runoff water.
- B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from construction activity.
- C. Chemical Wastes: Includes salts, acids, alkalis, herbicides, pesticides, and organic chemicals.
- D. Sanitary Wastes: Wastes characterized as domestic sanitary sewage.

**1.2 ENVIRONMENTAL PROTECTION REQUIREMENTS**

Contractor is advised that the project is subject to municipal standards, the standards of Maine Department of Environmental Protection (DEP) Erosion and Sedimentation Control Law requirements (MRSA 38 § 420-C), and the standards of the Maine DEP Stormwater Management Law MRSA 39 § 420-D). Provide and maintain during the life of the Contract, environmental protection as defined therein. Provide environmental protective measures as required to prevent or control pollution that develops during normal construction practice. Provide environmental protection measures required to correct conditions that develop during the construction of permanent or temporary features associated with the project. Prevent unauthorized placement of fill, any material, or any unauthorized disturbance of any natural resource. Comply with all federal, state, and local regulations pertaining to water, air, and noise pollution.

**PART 2 - PRODUCTS**

Not Used

**PART 3 - EXECUTION****3.1 PROTECTION OF NATURAL RESOURCES**

No wetland shall be disturbed. Other natural areas shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the Work. Confine construction activities to areas defined by the work schedule, Drawings, and Contract Documents.

- A. Land Resources: Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special approval of the Owner's representative. Do not fasten or attach ropes, cables, or guys to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is authorized, the Contractor shall be responsible for any resultant damage.

1. Protection: Protect existing trees that are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operators. Remove displaced rocks from uncleared areas. Protect monuments and markers.
  2. Repair and Restoration: Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment operations. Obtain approval of the repair or restoration from the Engineer prior to its initiation.
  3. Temporary Construction: Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and all other vestiges of construction. Temporary roads, parking areas, and similar temporary use areas shall be graded in conformance with surrounding areas and revegetated, seeded, or sodded as required by the plans.
- B. Water Resources: Perform all work in such a manner that any adverse environmental impact on water resources is avoided. Storage of hydraulic fluid is not permitted on-site. Quantities of bulk materials shall be reduced to a level acceptable to the Owner's representative.

### **3.2 EROSION AND SEDIMENT CONTROL MEASURES**

- A. Burn-off: Burn-off of ground cover is not permitted.
- B. Protection of Erodible Soils: All earthwork brought to final grade shall be immediately finished as indicated or specified. Protect immediately side slopes and backslopes upon completion of rough grading. Plan and conduct all earthwork in such a manner as to minimize the duration of exposure of unprotected soils, and in no case shall exposure exceed seven (7) days. Consult weather forecasts prior to exposing large areas of soil. Check erosion control measures before forecasted major storm events.
- C. Temporary Protection to Erodible Soils: Utilize the following methods to prevent erosion and control sedimentation.
1. Vegetation and Mulch: Provide temporary protection on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed to require protection to prevent erosion. Such protection shall be by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

### **3.3 CONTROL AND DISPOSAL OF SOLID, CHEMICAL AND SANITARY WASTES**

Pick up solid wastes and place in containers that are emptied on a regular schedule. The preparation, cooking and disposing of food is strictly prohibited on the project site. Conduct handling and disposal of wastes to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Remove signs of temporary construction and activities incidental to construction of permanent work in place

- A. Disposal of Rubbish, Garbage, and Debris: Dispose of rubbish, garbage and debris in accordance with the requirements specified herein.
- B. Sewage, Odor, and Pest Control: Dispose of sewage through chemical toilets or comparable effective units and periodically empty wastes. Include provisions for pest control and elimination of odors.



- C. Petroleum Products: Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting federal, state and local regulations.

### **3.4 DUST CONTROL**

Keep dust down at all times, including nonworking hours, weekends, and holidays. Sprinkle or treat with dust suppressers, the soil at the site, haul roads, and other areas disturbed by operations. Petroleum products will not be used as suppressers. No dry power brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming.

### **3.5 NOISE**

Except for required equipment safety, no blasting or use of explosives is permitted without written permission of the owner's representative and then only during designated times. Devices such as backup alarms noise shall not exceed the noise limits of the authority, or municipality, having jurisdiction.

**END OF SECTION 01 35 43**

**SECTION 01 40 00**  
**QUALITY REQUIREMENTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. References and standards.
- B. Quality assurance submittals.
- C. Samples, Mock-ups and Sample Field Installations.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection services
- G. Manufacturers' field services.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 00 00 - General Requirements.
- B. Section 01 30 00 - Administrative Requirements: Submittal procedures.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.
- B. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.
- C. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- D. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2011.
- E. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2008a.

**1.04 SUBMITTALS**

- A. Testing Agency Qualifications: Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Testing Agency's Reports: After each test/inspection, promptly submit one copy of reports to Architect, Engineer, Building Official and to Owner. Information required on Test Reports shall be as identified herein for the Owner's Testing Agency. All tests conducted by the Contractor shall be submitted to the Architect and Owner, without exception.
- C. 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 conforms to 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.
- D. 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.
- E. Manufacturer's Field Reports: Submit reports within ten (10) days of observation to Architect and Owner for their information and record.
- F. Erection Drawings: Submit drawings to the Architect for information.

1. Submit for information for the sole and limited purpose of generally assessing conformance with the design intent expressed in the Contract Documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect.

#### **1.05 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. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

#### **1.06 TESTING AND INSPECTION AGENCIES**

- A. Quality control services include inspections, tests, and related actions including reports performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.
- B. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- C. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
- D. Inspections, tests and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
- E. Requirements for the Contractor to provide quality control services as directed by the Architect, Owner, or authorities having jurisdiction are not limited by the provisions of this Section.
- F. Testing and Inspection Agencies Quality Assurance:
  1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 543, ASTM C 1021, ASTM C 1077, ASTM C 1093, and ASTM D 3740.
  2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
  3. Laboratory: Authorized to operate in the State of Maine.
  4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
  5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

#### **1.07 SPECIAL TESTS AND INSPECTIONS**

- A. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by Authorities Having Jurisdiction, as indicated in individual Specification Sections, in the Statement of Special Inspections, the Building Code of Maine, and as follows:
  1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect, Contractor and Owner promptly of irregularities and deficiencies observed in the Work during performance of its service.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, Owner, Contractor and to Authorities Having Jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion which includes a list of unresolved deficiencies to Architect, Owner, Contractor and Authorities Having Jurisdiction.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.



6. Retesting and re-inspecting corrected work.

## **PART 2 PRODUCTS - NOT 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 and recommendations, 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 SAMPLES, MOCK-UPS AND SAMPLE FIELD INSTALLATIONS**

- A. Tests shall be performed under provisions identified in this Section and identified in the respective product Specification Sections.
- B. Assemble and erect specified items at full scale, with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. The purpose of mock-ups and sample field installations shall be to clearly establish standards of quality for the Work prior to proceeding with the Work itself. They shall be constructed in sizes, locations and quantities as directed by the Architect.
- D. To the extent possible, all samples, mock-ups and sample field installations accepted by Architect shall be preserved until the Work itself has been completed and accepted by the Architect. The alteration, destruction or removal of mock-ups and sample installations shall not commence without the Architect's prior authorization.
- E. The Contractor and/or his subcontractors shall construct or prepare all samples, mock-ups and sample field installations as required in individual Specification Sections or as directed by the Architect.
- F. Sample field installations are full sized, fully fabricated, cured, and finished built in-place assemblies that maybe permanent if acceptable to the Architect.
- G. Samples shall be clearly marked with the manufacturer's name, generic description of the sample and compliance with required standards. Where samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
- H. All costs related to providing, maintaining and removing required samples, mock-ups and sample field installations shall be paid by the Contractor.

### **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. Owner Responsibilities:
1. The Owner will provide observations, inspections, tests and similar quality control services specified to be performed by independent agencies, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. The costs for Owner provided testing and inspection services shall be paid for by the Owner.
  2. The Owner will employ directly an independent agency, testing laboratory, or other qualified firm to perform services that are the Owner's responsibility. Such inspections and tests may include, but shall not be limited to:
    - a. Soils Analysis.
    - b. Subgrade Preparation.
    - c. Soils Compaction.
    - d. Bituminous Pavement Mix Design and Compaction.
    - e. Concrete Reinforcement.
    - f. Cast-In-Place Concrete.
    - g. Mortar and Grout.
    - h. Unit Masonry (testing during construction) and Masonry observation/inspections.
    - i. Structural Steel, Steel Joist and Steel Deck.
    - j. Other testing specified to be by Owner required under individual Specification Sections.
  3. Systems commissioning for HVAC, electrical, and lighting systems. The Contractor, his designated subcontractors and authorized manufacturer's representatives shall cooperate and participate in the actual systems commissioning. The Contractor shall schedule the commissioning activities within the CPM Schedule and manage the commissioning process. See mechanical and electrical specifications for further information.
- C. Testing Agency Duties:
1. Test samples of mixes submitted by Contractor.
  2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
  3. Perform specified sampling and testing of products in accordance with specified standards.
  4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
  5. Promptly notify (within 24 hours) Owner, Architect and Contractor of observed irregularities or non-conformance of Work or products during performance of its services.
  6. Perform additional tests and inspections required by Architect.
  7. Submit written reports of all tests, inspections or other services to the Architect, Owner, Contractor and local Building Authority. Reports indicating compliant inspections shall be submitted within three (3) days. Reports shall include:
    - a. Date of issue.
    - b. Project name and number.
    - c. Name, address, and telephone number of testing agency.
    - d. Dates and locations of samples and tests or inspections.
    - e. Names of individuals making tests or inspections.
    - f. Designation of the Work and test method.
    - g. Identification of product and Specification Section.
    - h. Complete inspection or test data.
    - i. Test results and interpretations of test results.
    - j. Ambient conditions at time of sample taking, testing, or inspection.
    - k. Comments or professional opinion regarding whether inspected or tested Work complies with the Contract Documents.
    - l. Recommendations for re-testing.

- m. Name and signature of laboratory inspector.
- 8. The Testing Agency shall maintain a complete deficiency list of all items not corrected and shall re-test and/or re-inspect as required after each deficiency has been corrected. All such re-testing and re-inspection shall be at the Contractor's expense. The Testing Agency shall submit a final signed report, stating whether or not all corrections have been made and the Work tested and inspected conforms to the Contract Documents.
- 9. Limits on Testing/Inspection Agency Authority:
  - a. Agency may not release, revoke, alter, or expand on requirements of Contract Documents.
  - b. Agency may not approve or accept any portion of the Work.
  - c. Agency may not assume any duties of Contractor.
  - d. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
  - 1. The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity. Costs for these services shall be included in the Contract Sum.
  - 2. The Contractor shall employ and pay an independent testing agency to perform quality control services, including but not limited to inspections, sampling and tests required for determining the suitability of materials prior to delivery to the site and other services as specified in the Specification Sections. Such inspections and tests shall include, but may not be limited to the following:
    - a. Analysis of loam.
    - b. Off-site borrow.
    - c. Concrete mix designs and pre-construction tests.
    - d. Cast underlayment testing.
    - e. Pre-construction unit masonry testing.
    - f. Sealant testing.
    - g. Elevator and Lifts.
    - h. Electrical systems.
    - i. HVAC systems.
    - j. Piping systems.
    - k. Roofing.
    - l. Fireproofing.
    - m. Firestopping.
    - n. Substrate moisture testing for finishes.
    - o. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
  - 3. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
  - 4. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
  - 5. 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.
  - 6. Notify Owner's Representative, Architect and laboratory sufficiently in advance of operations to allow for the proper assignment of personnel and scheduling of tests and inspections.



7. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing:
1. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
  2. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.
  3. The Contractor is responsible for re-testing where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with the Contract Document requirements, regardless of whether or not the original test was the Contractor's responsibility. Cost of re-testing construction revised or replaced by the Contractor is the Contractor's responsibility.

### **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 of equipment as applicable, and to initiate instructions when necessary.
- B. Report in writing, 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 conforming to 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**

**SECTION 01 45 33**  
**CODE-REQUIRED SPECIAL INSPECTIONS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Code-required special inspections.
- B. Testing services incidental to special inspections.
- C. Submittals.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 40 00 - Quality Requirements: General requirements for testing and inspections.
- C. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

**1.03 DEFINITIONS**

- A. Code or Building Code: 2009 Edition of the International Building Code, as amended by Maine, Chapter 17 - Structural Tests and Inspections, of same.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
- C. Special Inspection:
  - 1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Construction Documents and the referenced standards.
  - 2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

**1.04 REFERENCE STANDARDS**

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
- B. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.
- C. AISC 360 - Specification for Structural Steel Buildings; 2010.
- D. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2015.
- E. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2012.
- F. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete; 2010.
- G. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- H. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2014a.
- I. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2013.
- J. ASTM E605 - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2011.
- K. ASTM E736 - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2011.

- L. AWCI 125 - Technical Manual 12-B: Standard Practice for the Testing and Inspection of Field-Applied Thin Film Intumescent Fire-Resistance Materials; 1998.
- M. AWS D1.1 - Structural Welding Code - Steel; 2011 w/Errata.
- N. AWS D1.3 - Structural Welding Code - Sheet Steel; 2008.
- O. AWS D1.4 - Structural Welding Code - Reinforcing Steel; 2011.
- P. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.
- Q. IAS AC291 - Accreditation Criteria for Special Inspection Agencies; 2012.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Special Inspectors: Prior to the start of work, proposed Special Inspectors shall submit their qualifications to the AHJ for review and acceptance.
- C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency shall submit the following to the AHJ, Architect, Structural Engineer of Record, Owner and Contractor:
  - 1. Agency name, address, and telephone number, and names of full time licensed Engineer and responsible officer.
  - 2. 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. Documentation that Testing Agency is accredited by IAS according to IAS AC89.
- D. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector shall promptly submit copies of report to Architect, Structural Engineer of Record, Contractor, Owner's Representative and AHJ.
  - 1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of Special Inspector.
    - d. Date and time of special inspection.
    - e. Identification of fabricated item and specification section.
    - f. Location in the Project.
    - g. Results of special inspection.
    - h. Verification of fabrication and quality control procedures.
    - i. Conformance with Construction Documents.
    - j. Conformance to referenced standard(s).
- E. Test Reports: After each test or inspection, promptly submit copies of report to Architect, Structural Engineer of Record, Contractor, Owner's Representative and AHJ.
  - 1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and specifications section.
    - f. Location in the Project.
    - g. Type of test or inspection.
    - h. Date of test or inspection.
    - i. Results of test or inspection.
    - j. Conformance with Construction Documents.
- F. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect, Structural Engineer of Record, Contractor, Owner's Representative and AHJ, in quantities specified for Product Data.



1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- G. Special Inspection Reports: After each special inspection, all Special Inspectors and Testing Agencies shall promptly submit copies of report to Architect, Structural Engineer of Record, Contractor, Owner's Representative, and AHJ at intervals identified on the Statement of Special Inspections.
  1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of Special Inspector.
    - d. Date and time of special inspection.
    - e. ICC, AWS and ACI certification #'s.
    - f. Identification of product and Specifications Section.
    - g. Location in the Project.
    - h. Type of special inspection.
    - i. Date of special inspection.
    - j. Results of special inspection.
    - k. Conformance with Construction Documents.
  2. Final Special Inspection Report: Each Special Inspector shall submit a Final Report upon the conclusion of each special inspection regime. Document special inspections and correction of failed testing and inspections, corrective action and successful re-tests in a final report to be submitted to the AHJ, Architect, Structural Engineer of Record, Owner and Contractor.
  3. The Architect as Registered Design Professional in Responsible Charge shall assemble all Final Reports submitted by the Special Inspectors, determine that all required test and inspection reports have been submitted, and submit a Project Final Report Summary to the AHJ, Owner and Contractor.

#### **1.06 TESTING AND INSPECTION AGENCIES**

- A. The Owner shall employ services of independent inspection and testing agency and/or agencies to perform Special Inspections required by the building code.
  1. The Owner may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.
- B. Employment of agency(s) in no way relieves the Contractor of obligation to perform the Work in accordance with requirements of the Construction Documents.

### **PART 2 PRODUCTS – NOT USED**

### **PART 3 EXECUTION**

#### **1.01 SCHEDULE OF SPECIAL INSPECTIONS**

- A. Frequency of Special Inspections: Special Inspections are indicated as continuous, periodic, or aperiodic.
  1. Continuous Special Inspection: Approved individual of the Special Inspection agency shall be present in the area where the work is being performed and observe the work at all times the work is in progress.
  2. Periodic Special Inspection: Approved individual of the Special Inspection agency shall be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.
  3. Aperiodic Special Inspection: Approved individual of the Special Inspection agency shall be present in the area where work is being performed and observe the work irregularly scheduled as required or as needed.

**1.02 TESTING AGENCY AND INSPECTORS DUTIES AND RESPONSIBILITIES**

- A. See Section 01 40 00 – Quality Requirements, for the duties and responsibilities of the testing agency and inspectors.

**1.03 CONTRACTOR DUTIES AND RESPONSIBILITIES**

- A. See Section 01 40 00 – Quality Requirements, for the duties and responsibilities of the Contractor.

**1.04 STATEMENT OF SPECIAL INSPECTIONS**

- A. See the appended Statement of Special Inspections following this Section, for the scope of required testing and inspections for this Project.

**END OF SECTION**

## Statement of Special Inspections

Mid-Coast School of Technology – Region 8

Bid Documents

19 June 2017

Project Name: Mid-Coast School of Technology – Region 8  
Location: Rockland, Maine

Owner: Mid-Coast School of Technology – Region 8  
Rockland, Maine 04073

Architect of Record (AoR): Chris Drobat, President 603-622-5450  
& Registered Design Professional  
in Responsible Charge (RDPiRC): Lavallee Brensinger Architects  
155 Dow St. Manchester, NH

Structural Engineer of Record (SER): Ethan A Rhile, P.E. 207-879-1838  
Becker Structural Engineers Inc  
75 York Street, Portland, ME

Testing Agency(s) (TA): **TO BE DETERMINED**

Geotechnical Engineer (GE): Craig W Coolidge, P.E. 207-318-7761  
Summit Geoengineering Services  
173 Pleasant Street, Rockland, ME

Commissioning Agency (CA): **TO BE DETERMINED**

Specialty Engineer(s) (SE): **TO BE DETERMINED**

This Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the International Building Code, 2009 edition.

The firms, agencies, or individuals noted above (hereafter referred to collectively as agents) will perform the structural tests and inspections as specified herein.

The complete set of Construction Documents (Drawings and Specifications) that accompany the application for building permit is to be considered attached to this program as reference material.

This program does not relieve the Contractor of their responsibility to conduct the work in accordance with the requirements of the Construction Documents, the approved Shop Drawings and the Maine State Building Code.

**Construction Categories:** The following construction categories are included in the Statement of Special Inspections for this Project. Specific tests and inspections required for each designated category are listed on the page noted opposite the category.

<u>Construction Category</u>	<u>Page</u>	<u>Construction Category</u>	<u>Page</u>
Structural Steel Framing	3-4	Controlled Fill	8-9
Shear Connectors	3-4	Site Infrastructure	8-9
Steel Joist Framing	3-4	Curtain Walls	10
Steel Decking	3-4	Storefront	11
Cast-In-Place Concrete	5-6	Arch, Mech & Electrical Components	12
Masonry	7	Steel Stairs & Handrails/Guardrails	13
Earthwork	8-9	Cold Formed Metal Framing	14
In-situ Bearing Strata	8-9	Fireproofing	15

**Performance Specifications:** The following construction components are designated in the Construction Documents on the basis of a performance specification to be designed by the Contractor's or Subcontractor's registered professional engineer, i.e. Specialty Engineer - SE.



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Mid-Coast School of Technology – Region 8

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<u>Construction Component</u>	<u>Page</u>
Curtainwall	10
Storefront	11
Steel Stairs & Handrails/Guardrails	13
Cold Formed Metal Framing	14

**Reports:** Test and inspection reports prepared by the AOR, SER, TA, GE, and SE will be collected and maintained by the RDPiDC and distributed, according to the procedures established by the Building Official. Prior to the issuance of a certificate of occupancy the RDPiDC will submit a final report to the Owner and Building Official in accordance with the Building Code.

Prepared by the SER:

Name: Ethan A Rhile, P.E.  
Maine Professional Engineer Registration # 10266 (Structural)

Signature: \_\_\_\_\_

Firm: Becker Structural Engineers Inc

Date: \_\_\_\_\_

Registered Design Professional in Responsible Charge:

Name: Chris Drobat, R.A., AIA  
Maine Registered Architect # 3254

Signature: \_\_\_\_\_

Firm: Lavallee Brensinger Architects

Date: \_\_\_\_\_

<b>Steel Construction</b> <b>(IBC 2009 Section 1704.3)</b> <b>(Specification Sections 051200, 052100 &amp; 053100)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2,3</sup>	Frequency
1. Steel Construction QC Review	<ul style="list-style-type: none"> <li>Review Contractor's field quality control procedures.</li> <li>Review frequency and scope of field testing and inspections.</li> </ul>	Spec. Section 051200	SER	-	Each submittal
2. Fabricator and Erector Certifications	<ul style="list-style-type: none"> <li>Review AISC Certified Fabricator Submittals.</li> </ul>	AISC (Fabricator) Certification Standard for Steel Building Structures (STD) and AISC Certified Steel Erector (CSE)	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>For record and use in field verification</li> </ul>		TA	Periodic	In conjunction with related field visits
3. Materials	<ul style="list-style-type: none"> <li>Review material certifications for conformance to Specifications.</li> </ul>	AISC 360 A3.1 AISC 360 A3.3 & 3.4 Spec. Section 051200	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>For record and use in field verification</li> </ul>		TA	Periodic	In conjunction with related field visits
4. Anchor Rods	<ul style="list-style-type: none"> <li>Review Contractor's as-built survey.</li> <li>Verify that all anchor rods have been properly torqued and have adequate fit-up.</li> </ul>	ASTM F1554 AISC 360 M4 Spec. Section 051200	TA	Periodic	Verify bolt length, projection and condition. Verify "Snug tight" torque for 100% of anchor bolts in braced bays, 20% in all other cases.
5. Bolting	<ul style="list-style-type: none"> <li>Verify bolt size and grade.</li> <li>Test and inspect bolted connections.</li> </ul>	AISC 360 A3.3 & M2.5 Spec. Section 051200 AISC Specification for Structural Joints Using A325 or A490 Bolts	TA	Continuous (Slip-critical)	As appropriate for connection type and fastener type. Per Construction Documents and AISC specifications.
			SER	-	SER to review conditions requested by TA
6. Welding	<ul style="list-style-type: none"> <li>Check welder qualifications.</li> <li>Check weld identification markings.</li> <li>Test and inspect welds.</li> </ul>	AWS D1.1 Section 6 Spec. Section 051200	TA	<u>Continuous:</u> •Complete and partial penetration groove welds, •Multiple pass fillet welds, •Plug and slot welds •Single pass fillet welds >5/16"  <u>Periodic:</u> •Fillet welds ≤ 5/16"	<u>At complete and partial penetration groove welds:</u> Visually inspect and test all welds by ultrasonic or radiographic methods. If for an individual welder, the rejection rate is demonstrated to be five (5) percent or less, the non-destructive testing rate may be reduced to twenty-five (25) percent for the individual welder. The evaluation of the welding shall be based on a sampling of at least forty (40) completed welds and completed by an AWS Certified Weld Inspector.  <u>At all other welds:</u> Visually inspect all welds and test as required by magnetic particle, ultrasonic or radiographic methods and shall be completed by an AWS Certified Weld Inspector.
			SER	-	SER to review conditions requested by TA

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7. Shear Connectors	<ul style="list-style-type: none"> <li>• Check against Construction Documents and latest approved shop drawings.</li> <li>• Inspect shear connectors for size, quantity, and location.</li> <li>• Test shear connectors for proper weld attachment.</li> </ul>	AWS D1.1 Section 7 Construction Documents Spec. Section 051226	TA	Periodic	Test a minimum of 10% of shear connectors; if one or more fail, then test all shear connectors.
			SER	-	SER to review conditions requested by TA
8. Structural Framing, Details, and Assemblies	<ul style="list-style-type: none"> <li>• Check against Construction Documents and latest approved shop drawings.</li> <li>• Inspect for size, grade of steel, camber, installation, and connection details.</li> <li>• Verify steel frame joint details including: <ul style="list-style-type: none"> <li>• Details such as bracing and stiffeners</li> <li>• Moment connections</li> <li>• Joint configurations and locations</li> <li>• Preparation of faying surfaces</li> </ul> </li> </ul>	Construction Documents Spec. Section 051200	TA	Periodic	All framing, details, and assemblies.
			SER	-	SER to review conditions requested by TA
9. Open Web Steel Joists	<ul style="list-style-type: none"> <li>• Inspect condition of joists for any damage to members and/or welds.</li> <li>• Inspect for size, placement, bridging, bearing, and connection to structure.</li> </ul>	SJI Standard Specs. Construction Documents Spec. Section 052100	TA	Periodic	Visually inspect all noted items, including 5% of joist support welds at randomly selected locations
			SER	-	SER to review conditions requested by TA
10. Expansion & Adhesive Anchors	<ul style="list-style-type: none"> <li>• Review installation procedures for both mechanical anchors and adhesive anchors.</li> <li>• Verify that materials are suitable for job conditions.</li> </ul>	ACI 318 Appendix D Anchor manufacturer's instructions	TA	Periodic	All anchors
			SER	-	Each submittal
11. Steel Decking	<ul style="list-style-type: none"> <li>• Verify gage, depth, and type.</li> <li>• Inspect placement, laps, welds, side lap attachments, and mechanical fasteners</li> <li>• Check welder qualifications.</li> </ul>	SDI Steel Deck Design Manual AWS D1.3 Section 7 Construction Documents Spec. Section 053100	TA	Periodic	All decking and connections, inspection shall be completed by a AWS Certified Weld Inspector.
			SER	-	SER to review conditions requested by TA
12. Field Correction of Fabricated Items	<ul style="list-style-type: none"> <li>• Review documentation of approved repairs and verify completion of repairs.</li> </ul>	Construction Documents Spec. Section 051200	TA	As required, per above	Each repair
			SER	-	SER to review conditions requested by TA

<sup>1</sup>Continuous Inspection: Full-time observation of the indicated work by approved individual of the noted Agency, as the work is being performed.

<sup>2</sup>Periodic Inspection: Part-time or periodic observation of the indicated work by an approved individual of the noted Agency and an inspection of the completed work.

<sup>3</sup>Aperiodic Inspection: Irregularly scheduled as required or as needed observation of the indicated work by an approved individual of the noted Agency; Principal Inspection responsibility is that of the Testing Agent TA.



<b>Concrete Construction (IBC 2009 Section 1704.4) (Specification Section 033000)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2,3</sup>	Frequency
1. Cast in Place Concrete Construction QC Review	<ul style="list-style-type: none"> <li>Review Contractor's field quality control procedures.</li> <li>Review frequency and scope of field testing and inspections.</li> </ul>	Construction Documents Spec. Section 033000	SER	-	Each submittal
2. Mix Design	<ul style="list-style-type: none"> <li>Review mix designs prior to placement.</li> </ul>	Construction Documents Spec. Section 033000	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>Verify use of approved mix design.</li> </ul>	ACI 318, 1.3.2.A ACI 318, Chapter 4 ACI 318, 5.2-5.4	TA	-	Each concrete placement
3. Materials	<ul style="list-style-type: none"> <li>Review material certifications for conformance to Specifications.</li> </ul>	Construction Documents Spec. Section 033000	SER & TA	-	Each submittal
4. Batching Plant	<ul style="list-style-type: none"> <li>Review plant quality control procedures and batching/mixing methods.</li> </ul>	ACI 304	TA	-	One (1) visit at the start of production & one (1) during the production period. Additional visits may be requested by the SER, if necessary.
5. Reinforcement Installation	<ul style="list-style-type: none"> <li>Use latest set of approved reinforcing bar shop drawings.</li> <li>Inspect reinforcing for grade, size, quantity, spacing, lap lengths, bends, hooks, condition, and placement.</li> <li>Verify adequate cover per specifications.</li> <li>Confirm dowel installation for masonry and concrete, including embedment lengths.</li> </ul>	ACI 318, 1.3.2.C ACI 318, 7.5	TA	Periodic	Each concrete placement
			SER	-	SER to review conditions requested by TA
6. Anchor Rods	<ul style="list-style-type: none"> <li>Inspect anchor rods prior to and during placement of concrete.</li> </ul>	ACI 318 1.3.2.C	TA	Continuous	All anchor rods
			SER	-	SER to review conditions requested by TA
7. Formwork	<ul style="list-style-type: none"> <li>Inspect forms for cleanliness and for proper sizes/locations of concrete members.</li> </ul>	ACI 318 6.1.1	TA	Periodic	Each concrete placement
			SER	-	SER to review conditions requested by TA

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8. Concrete Placement and Sampling of Fresh Concrete	• Review hot-weather and cold-weather placement procedures submitted by the Contractor.	ACI 305ACI 306	SER	-	Each submittal
	• Verify conformance to Specifications including hot-weather and cold-weather placement procedures.	ACI 305 ACI 306	TA	-	Each concrete placement
	• Observe concrete placement operations. • Check that total water does not exceed amount in design mix.	ACI 318, 1.3.2.D ACI 318, 5.9-5.10	TA	Continuous	Each concrete delivery
			SER	-	SER to review conditions requested by TA
	• Concrete Strength	ASTM C31, C39 & C172	TA	-	For each strength of concrete, each day, take six (6) standard 6"x12" cylinders for the first placement up to 50 CY. Then take six (6) additional cylinders for every 50 CY thereafter. Take sample from point of discharge and at time fresh concrete is placed. Concrete for each set of cylinders shall be from (1) representative sample of the entire batch.
	• Concrete Slump	ASTM C143			
	• Concrete Air Content	ASTM C231			
	• Concrete Temperature	ASTM C1064			
10. Evaluation of Concrete Strength	• Test and evaluate in accordance with the Specifications.	Construction Documents Spec. Section 033000 ACI 214 ASTM C42	TA	-	(1) 7-day & (2) 28-day results. Hold (2) for 56-day results, as needed.
			SER	-	Each submittal
11. Curing and Protection	• Observe procedures for conformance to the Specifications.	Construction Documents Spec. Section 033000	TA	Periodic	Each concrete placement
			SER	-	SER to review conditions requested by TA
12. Welding Reinforcing Steel	• Verify that rebar is ASTM A706 and observe preheating as necessary.	ACI 318, 3.5.2 ASTM A706 AWS D1.4, Section 7	TA	Continuous	Visual inspection of all welds
13. Mechanical Reinforcing Splices	• Confirm that the correct, approved couplers are being used. • Verify proper embedment, joint fit-up, and tightness of mechanical parts.	ACI 318, Chapter 12 & Manufacturer's installation instructions	TA	Periodic	Visual inspection of all splices

<sup>1</sup>Continuous Inspection: Full-time observation of the indicated work by approved individual of the noted Agency, as the work is being performed.

<sup>2</sup>Periodic Inspection: Part-time or intermittent observation of the indicated work by an approved individual of the noted Agency and an inspection of the completed work.

<sup>3</sup>Aperiodic Inspection: Irregularly scheduled as required or as needed observation of the indicated work by an approved individual of the noted Agency; Principal Inspection responsibility is that of the Testing Agent TA.

<sup>4</sup>TA shall coordinate initial visit with SER to review reinforcing inspection requirements.

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<b>Masonry Construction (IBC 2009 Section 1704.5) (Specification Section 042000)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2</sup>	Frequency
1. Tests Submitted by Contractor for Masonry Units/ Assemblages	<ul style="list-style-type: none"> <li>Review mortar, grout, and prism tests submitted by Contractor.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530.1 Art. 1.5	AoR & TA	-	Each class of masonry unit and type of masonry assemblage.
2. Materials Certification	<ul style="list-style-type: none"> <li>Review masonry veneers, and mortar and grout materials.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530.1 Art. 1.4B	AoR	-	Each submittal
	<ul style="list-style-type: none"> <li>For record and field verification</li> </ul>		TA		In conjunction with related field visits
3. Testing & Evaluation of Mortar & Grout Strength	<ul style="list-style-type: none"> <li>Sample and test mortar and grout used in field for masonry construction.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530.1 Art. 1.4B	TA	-	For each type of mortar and grout, per every 5,000 square feet of wall surface area: test mortar per ASTM C780 test grout per ASTM C1019
	<ul style="list-style-type: none"> <li>Review test results for mortar and grout.</li> </ul>		AoR	-	Each report
4. Proportioning, Mixing, and Consistency of Mortar & Grout	<ul style="list-style-type: none"> <li>Observe field procedures for proportioning and mixing of the mortar and grout to be used in the masonry construction.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530.1 Art. 2.6	TA	Continuous	Once, for each type of grout, at the beginning of masonry construction
			AoR & TA	-	SER to review conditions requested by TA
5. Masonry Installation	<ul style="list-style-type: none"> <li>Inspect and report on installation of masonry units for general configuration and placement.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530.1 Art. 3.3	TA	Periodic	All locations
			TA	-	SER to review conditions requested by TA
6. Anchorage	<ul style="list-style-type: none"> <li>Inspect type, spacing, and placement of masonry anchors and ties.</li> </ul>	ACI 530 Sections 1.2.2.e & 1.16.1	TA	Periodic	All locations
			SER	-	SER to review conditions requested by TA
7. Reinforcement Installation	<ul style="list-style-type: none"> <li>Inspect reinforcement for grade, size, quantity, spacing, condition, cover, bar positioners, and placement.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530 Section 1.15 ACI 530.1 Art. 2.4 & 3.4	TA	Periodic	All locations
			SER	-	SER to review conditions requested by TA
8. Grouting Operations	<ul style="list-style-type: none"> <li>Inspect cells of masonry units for cleanliness prior to grouting. Observe partial/full grouting procedures.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530.1 Art. 2.6B	TA	Continuous	All locations
			SER	-	SER to review conditions requested by TA
9. Weather Protection	Review submittal on protection of masonry against cold and hot weather.	IBC Sections ACI 530.1 Articles 1.8C & 1.8D	AoR	-	Each submittal
	<ul style="list-style-type: none"> <li>Observe protection of masonry against cold and hot weather.</li> </ul>		TA	Periodic	Each masonry placement
10. Anchorage of Exterior Wall Masonry Veneer	<ul style="list-style-type: none"> <li>Inspect type, size, spacing, and placement of approved anchorage to adjacent back-up framing.</li> </ul>	Construction Documents Spec. Section 042000 ACI 530 Section 1.2.2.e	TA	Periodic	All locations
			AoR	-	Each submittal

<sup>1</sup>Continuous Inspection: Full-time observation of the indicated work by approved individual of the noted Agency, as the work is being performed.

<sup>2</sup>Periodic Inspection: Part-time or intermittent observation of the indicated work by an approved individual of the noted Agency and an inspection of the completed work.

<sup>3</sup>Aperiodic Inspection: Irregularly scheduled as required or as needed observation of the indicated work by an approved individual of the noted Agency; Principal Inspection responsibility is that of the Testing Agent TA.



<b>Soils</b> <b>(IBC 2009 Section 1704.7)</b> <b>(Specification Section 31 23 15)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2,3</sup>	Frequency
1. Excavation	<ul style="list-style-type: none"> <li>Review existing sub-soils and groundwater conditions during building excavation.</li> </ul>	Construction Documents Spec. Section 320000	GE	Periodic	At each location
2. Bearing Strata	<ul style="list-style-type: none"> <li>Review the in-situ bearing strata and compacted structural fill bearing strata for footings and slabs cast on grade.</li> </ul>	Construction Documents Spec. Section 320000	GE	Periodic	At each location
3. Structural Fill	<ul style="list-style-type: none"> <li>Observe and test compacted structural fill.</li> </ul>	Construction Documents Spec. Section 320000	GE	Continuous	At each location
4. Field Conditions	<ul style="list-style-type: none"> <li>Review existing conditions, procedures and in-situ bearing strata for underpinning.</li> </ul>	Construction Documents Spec. Section 314000	GE	Continuous	At each location
5. Concrete Placement	<ul style="list-style-type: none"> <li>Observe concrete placement operations.</li> </ul>	Construction Documents Spec. Sections 033000 & 314000	GE	Periodic	See Concrete Construction Requirements
6. Earthwork	<ul style="list-style-type: none"> <li>Observe and test excavation and soil placement</li> </ul>	Construction Documents Spec. Section 312000	TA & GE & Contractor	Periodic	Each Submittal & As noted in Construction Documents

<sup>1</sup>Continuous Inspection: Full-time observation of the indicated work by approved individual of the noted Agency, as the work is being performed.

<sup>2</sup>Periodic Inspection: Part-time or intermittent observation of the indicated work by an approved individual of the noted Agency and an inspection of the completed work.

<sup>3</sup>Aperiodic Inspection: Irregularly scheduled as required or as needed observation of the indicated work by an approved individual of the noted Agency; Principal Inspection responsibility is that of the Testing Agent TA.

**Statement of Special Inspections**  
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Site Infrastructure					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2,3</sup>	Frequency
7. Stormwater BMPs	<ul style="list-style-type: none"> <li>3<sup>rd</sup> party inspection during and after construction of stormwater best management practices (BMPs). BMPs include, but are not limited to, underdrained soil filters, infiltration basins, level spreader, subsurface sand filter, permeable pavers, porous pavement and tree filters. Contractor shall provide photos and as-builts of stormwater BMPs.</li> </ul>	Construction Documents  Volume III. BMP Technical Design Manual, by Bureau of Land and Water Quality, Maine Department of Environmental Protection, latest revision  Conditions of Approval of Department Order, Bureau of Land and Water Quality, Maine Department of Environmental Protection	Contractor	Continuous	At each location
8. Water Distribution	<ul style="list-style-type: none"> <li>Pressure testing and Disinfection</li> <li>Per Sanford Water District Requirements</li> </ul>	Construction Documents Spec. Section 221113 & Sanford Water District Specifications	Contractor	Aperiodic	At each location
9. Sewer	<ul style="list-style-type: none"> <li>Pressure testing</li> <li>Leakage testing</li> <li>Deflection Test</li> <li>Per Sanford Sewer District Requirements</li> </ul>	Construction Documents Spec. Section 221300 & Sanford Sewer District Requirements	Contractor	Aperiodic	After backfilling of piping
10. Asphalt Paving	<ul style="list-style-type: none"> <li>Thickness Test</li> <li>On-Site Density Testing</li> </ul>	Construction Documents Spec. Section 321216	TA	Aperiodic	Random locations during paving operations
11. Concrete Paving	<ul style="list-style-type: none"> <li>Testing of concrete</li> </ul>	Construction Documents Spec. Section 321313	TA	Aperiodic	As noted in Construction Documents
12. Erosion & Sedimentation Control	<ul style="list-style-type: none"> <li>Inspection of erosion control measures</li> </ul>	Construction Documents Spec. Section 312500	Contractor	Continuous/Periodic	As noted in Construction Documents

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<sup>3</sup>Aperiodic Inspection: Irregularly scheduled as required or as needed observation of the indicated work by an approved individual of the noted Agency.

# Statement of Special Inspections

Mid-Coast School of Technology – Region 8

Bid Documents

19 June 2017

<b>Glazed Aluminum Curtain Walls</b> <b>(IBC 2009 Section 1704.15)</b> <b>(Specification Section 084410)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2</sup>	Frequency
1. Glazed Aluminum Curtainwalls	<ul style="list-style-type: none"> <li>Review supplier's structural design of system.</li> </ul>	Construction Documents Spec. Section 084410	SER	-	Each submittal
2. Material Certification	<ul style="list-style-type: none"> <li>Review materials used.</li> </ul>	Construction Documents Spec. Section 084410	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>For record and use in field verification.</li> </ul>		TA		In conjunction with related field visits
3. Installation of Glazed Aluminum Curtainwalls	<ul style="list-style-type: none"> <li>Inspect type, size, gauge, spacing, and placement of members for conformance to the approved Curtain Wall Shop Drawings and Construction Documents.</li> <li>Inspect member-to-member connections and connections/anchorage to adjacent steel/concrete/wood support elements.</li> </ul>	Construction Documents Spec. Section 084410 Manufacturer's installation instructions	TA	Periodic	All locations
			SE	-	Once during performance of the work and once after completion of the work

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## Statement of Special Inspections

Mid-Coast School of Technology – Region 8

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19 June 2017

<b>Aluminum Storefront (IBC 2009 Section 1704.15) (Specification Section 084313)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2</sup>	Frequency
1. Aluminum Storefront	<ul style="list-style-type: none"> <li>Review supplier's structural design of system.</li> </ul>	Construction Documents Spec. Section 084313	SER	-	Each submittal
2. Material Certification	<ul style="list-style-type: none"> <li>Review materials used.</li> </ul>	Construction Documents Spec. Section 084313	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>For record and use in field verification.</li> </ul>		TA		In conjunction with related field visits
3. Installation of Glazed Aluminum Storefront	<ul style="list-style-type: none"> <li>Inspect type, size, gauge, spacing, and placement of members for conformance to the approved Storefront Shop Drawings and Construction Documents.</li> <li>Inspect member-to-member connections and connections/anchorage to adjacent steel/concrete/wood support elements.</li> </ul>	Construction Documents Spec. Section 084313 Manufacturer's installation instructions	TA	Periodic	All locations
			SE	-	Once during performance of the work and once after completion of the work

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<sup>2</sup>Periodic Inspection: Part-time or intermittent observation of the indicated work by an approved individual of the noted Agency and an inspection of the completed work.

## Statement of Special Inspections

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<b>Architectural, Mechanical and Electrical Components</b> <b>(IBC 2009 Section 1707)</b> <b>Building Seismic Design Category: D</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2</sup>	Frequency
1. Mechanical and Electrical Components	<ul style="list-style-type: none"> <li>In Seismic Design Categories C, D, E, &amp; F, Special Inspection is required for mechanical and electrical equipment as follows:                             <ol style="list-style-type: none"> <li>Refer to Mechanical/Electrical Drawings and Specifications</li> </ol> </li> </ul>	IBC 1707.7	MEP	Periodic	In conjunction with related field visits.
					Review of reports and other documents by TA.
			TA	Periodic	In conjunction with related field visits.
2. Laboratory Exhaust	Refer to Mechanical and Electrical Drawings and Specifications.	-	MEP	-	During component installation and as work is completed. Review of reports by TA.
			TA	-	During component installation and as work is completed.

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## Statement of Special Inspections

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<b>Stairs and Railings</b> <b>(IBC 2009 Section 1704.15)</b> <b>(Specification Section 055100)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2,3</sup>	Frequency
1. Steel Stairs & Handrail/Guardrail Assemblies	<ul style="list-style-type: none"> <li>Review supplier's structural design of stair pans, stringers, landings, and railings.</li> </ul>	Construction Documents Spec. Section 055100	SER	-	Each submittal
2. Materials Certification	<ul style="list-style-type: none"> <li>Review certification of materials.</li> </ul>	Construction Documents Spec. Section 055100	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>For record and field verification.</li> </ul>	Construction Documents Spec. Section 055100	TA	Periodic	All locations
3. Installation of Steel Stairs & Handrail/Guardrail Assemblies	<ul style="list-style-type: none"> <li>Inspect installation of steel stairs.</li> <li>Check component type, size, spacing, and placement for conformance with the approved stair system design.</li> <li>Check member-to-member connections and connections to adjacent steel/concrete support elements.</li> </ul>	AWS D1.1 AISC 360 NAAMM Metal Stair Manual Construction Documents Spec. Section 055100	TA	Periodic	All locations
			SE	-	Once during performance of the work and once after completion of the work

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<sup>3</sup>Aperiodic Inspection: Irregularly scheduled as required or as needed observation of the indicated work by an approved individual of the noted Agency.



# Statement of Special Inspections

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Cold Formed Metal Framing Construction (IBC 2009 Section 1704.3) (Specification Section 054000)					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2</sup>	Frequency
1. Cold Formed Metal Exterior Wall Stud Backup Framing Design and Cold Formed Metal Roof Truss Design	<ul style="list-style-type: none"> <li>Review supplier's structural design of cold formed metal exterior wall stud backup framing</li> </ul>	Construction Documents Spec. Section 054000	SER	-	Each submittal
2. Materials Certification	<ul style="list-style-type: none"> <li>Review certification of materials.</li> </ul>	AISI Cold Formed Steel Design Manual Construction Documents Spec. Section 054000	SER	-	Each submittal
	<ul style="list-style-type: none"> <li>For record &amp; field verification</li> </ul>		TA		In conjunction with related field visits
3. Installation of Cold Formed Metal Exterior Wall Stud Backup Framing and Cold Formed Metal Roof Trusses	<ul style="list-style-type: none"> <li>Inspect type, size, gauge, spacing and placement of cold formed metal exterior wall studs, connections, anchorage, bridging, accessories, etc. for conformance with the approved Shop Drawings and Construction Documents.</li> </ul>	AISI Cold Formed Steel Design Manual Construction Documents Spec. Section 054000	TA	Periodic	All locations
			SE	-	Once during performance of the work and once after completion of the work

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<b>Fire-resistant Materials</b> <b>Specification Section 07 81 00 and 07 81 23.</b> <b>(IBC 2009 Sections 1704.12 &amp; 1704.13)</b>					
Item	Tests / Inspections	Code, Standard, or Document Reference	Agency	Type of Inspection <sup>1,2</sup>	Frequency
1. Materials Certification	Review materials certifications for conformance to Specifications	IBC 1704.12, 1704.13 Spec. Section 078100 and 078123 ASTM E605 ASTM E736	AOR	-	Each submittal
	For record and use in field verification		TA	Periodic	In conjunction with related field visits
2. Sprayed Fire-resistant Materials	<ul style="list-style-type: none"> <li>Inspect and test sprayed fire-resistant materials applied to floor/roof assemblies and structural members in accordance with ASTM E605 and ASTM E736, based on the fire-resistance design as designated in the Construction Documents. Inspections shall include: <ul style="list-style-type: none"> <li>Condition of substrates</li> <li>Thickness of application</li> <li>Density</li> <li>Bond strength adhesion/cohesion</li> <li>Condition of finished application</li> </ul> </li> </ul>	IBC 1704.12 Spec. Section 078100 ASTM E605 ASTM E736	TA	Periodic	<u>Floor &amp; Roof Assemblies:</u> <ul style="list-style-type: none"> <li>Thickness: 4 measurements per 1,000 square feet of sprayed area of each assembly at each story</li> <li>Density: 1 measurement per 2,500 square feet of sprayed area of each assembly at each story</li> <li>Bond Strength: 1 measurement per 2,500 square feet of sprayed area of each assembly at each story</li> </ul> <u>Structural Members:</u> <ul style="list-style-type: none"> <li>Thickness: 25 percent of the structural members at each story</li> <li>Density: 1 measurement per 2,500 square feet of sprayed area of each type of member at each story</li> <li>Bond Strength: 1 measurement per 2,500 square feet of sprayed area of each type of member at each story</li> </ul>
3. Mastic and Intumescent Fire-resistant Coatings	<ul style="list-style-type: none"> <li>Inspect coatings applied to structural elements in accordance with AWCI 12-B, based on the fire-resistance design as designated in the Construction Documents.</li> </ul>	IBC 1704.13 Spec. Section 078123 AWCI 12-B	TA	Periodic	At all locations

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**SECTION 01 50 00  
TEMPORARY FACILITIES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Project identification sign.
- I. Field offices.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 00 00 - General Requirements.
- B. Section 01 40 00 - Quality Requirements.

**1.03 QUALITY ASSURANCE**

- A. Comply with NFPA 241 Building Construction and Demolition Operations, ANSI A10 Safety Requirements for Construction and Demolition, AGC and ASC industry recommendations, and other applicable standards.
  - 1. Temporary electrical service shall comply with NECA Temporary Electrical Facilities, NEMA, UL and NFPA 70 National Electric Code.
- B. At the earliest time, when acceptable to the Owner, change over room use of temporary service to use of the permanent service.
- C. Operate temporary service and facilities in a safe and efficient manner, taking necessary fire prevention measures.

**1.04 TEMPORARY UTILITIES**

- A. Provide and pay for all drainage, storm water controls, electrical power, lighting, water, heating and cooling, ventilation, and other services required for construction purposes.

**1.05 TELECOMMUNICATIONS SERVICES**

- A. Project site telecommunications services shall include:
  - 1. Personal computer dedicated to project telecommunications, with necessary software and laser printer.
  - 2. Cell phones for project management personnel, including, Superintendent, Assistant Superintendent, and others the Contractor requires to complete the work.
  - 3. Internet Connections: Minimum of one; DSL modem or faster.
  - 4. Email: Account/address reserved for project use.

**1.06 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.

**1.07 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.

#### **1.08 FENCING**

- A. Construction: Commercial grade chain link fence 6 foot (min) high, around construction site; equipped with vehicular and pedestrian gates with locks.
- B. Provide tarps and/or other protection in locations necessary to avoid dust and debris from traveling into adjacent property areas and into the existing facility.

#### **1.09 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.

#### **1.10 SECURITY**

- A. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner.

#### **1.12 VEHICULAR ACCESS AND PARKING**

- A. Comply with regulations relating to use of streets and sidewalks, 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 parking areas used by the School and adjacent streets.
- E. Designated existing on-site roads may be established and used for construction traffic.
- F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

#### **1.13 WASTE REMOVAL**

- A. See Section 01 74 19 - Waste Management, 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.

#### **1.14 PROJECT IDENTIFICATION**

- A. Provide project identification sign.
- B. Erect on site at location approved by Owner and governing authorities.
- C. No other signs are allowed without Owner permission except those required by law.

- D. Size: 8' x 4' (unless otherwise required by local authorities) The Contractor shall be required to furnish and erect the Project sign complete in all respects, and to dismantle when so instructed by the Owner.
- E. Content: Display names and addresses of the Project, Owner, Architect, and Contractor. Graphics, text, lettering, colors, and location shall be provided by the Architect and approved by the Owner.
- F. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors. Do not permit installation of unauthorized signs. No other signs or advertisements shall be displayed on the premises without the approval of the Owner. Signage shall include, but not be limited to, delivery times (scheduled around school operation), way-finding, and designated parking areas.

#### **1.15 FIELD OFFICES**

- A. The Contractor shall provide and maintain an insulated, weather tight, field office at the site. The office shall be of sufficient size to accommodate required office personnel and meeting place for 12 people. Provide electrical service, heat, lighting, telephone, fax machine (if needed by the Contractor), and personal computer, Internet connected with e-mail capability and printer. At a minimum, furnish with a desk and chair for Superintendent, conference table and chairs, 4-drawer file cabinet(s), plan table, plan rack, and bulletin board. Equip with a water cooler and first aid cabinet unit. Existing facilities and/or new construction shall not be available for this purpose.
- B. The Owner shall provide and maintain a temporary office for the use of the Owner's Representative at the site.
- C. Temporary offices shall be maintained until the issuance of a Certificate of Substantial Completion and shall be removed when no longer required. The Contractor shall pay all costs in connection with the construction, servicing, maintenance, and removal of temporary offices.

#### **1.16 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition.
- D. Restore new permanent facilities used during construction to like-new condition.

### **PART 2 PRODUCTS**

#### **2.01 PRODUCTS**

- A. Tarpaulins: Waterproof, fire-resistant, UL labeled, with flame spread rating of 15 or less.
- B. Water: Potable water.

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Review locations of temporary facilities, equipment, and storage with the Architect and Owner, for the Owner's acceptance.
- B. Use qualified personnel for the installation of temporary facilities. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

#### **3.02 TEMPORARY UTILITY INSTALLATION**

- A. Temporary Water Service: The Contractor shall:

1. Provide and maintain a temporary water service, or install the permanent water service as required for the proper execution of the Work. Such service shall be installed in a manner approved by governing authorities.
  2. Pay for the installation and removal of any temporary service, and for all water used throughout the construction period.
  3. Pay for permits, if applicable, as required by governing authorities. Obtain easements across private property if required.
  4. Extend a supply adequate for all construction purposes and convenient to all trades.
  5. Protect lines against freezing and be fully responsible for the temporary installation in every way.
  6. Provide backflow preventer(s), vacuum breakers, etc., as required to protect water systems from contamination.
  7. Provide any and all hose needed. All service hoses shall be bubble-tight at all times. Trigger operated nozzles shall be used to reduce water waste. No leakage shall be acceptable. Remove all temporary equipment and materials completely upon completion of construction.
  8. Repair all damage caused by use of temporary or permanent water services.
- B. Temporary Electrical Services: The Contractor shall:
1. Provide and maintain temporary light and power as required for the proper execution of the Work. Such service shall be installed and maintained in conformance with NEMA, NECA, UL standards for temporary electric service, National Electric Code and in a manner approved by governing authorities and local utility regulations.
  2. Pay for the installation and removal of any temporary service, and for all electricity used throughout the construction period.
  3. Pay for permits, if applicable, as required by governing authorities. Obtain easements across private property if required.
  4. Extend a supply of temporary lighting and power adequate for all construction purposes and convenient to all trades.
  5. Accept full responsibility for the temporary installation in every way. Remove all temporary equipment and materials completely upon completion of construction.
  6. Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions. Provide a minimum of one (1) lamp per story at interior stairways and ladder runs, located to illuminate each landing and flight.
- C. Temporary Drainage and Storm Water Control: The Contractor shall provide drainage ditches, dry wells, stabilization ponds, and similar facilities. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge. Maintain temporary drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains. Protect site from puddling or running water. Provide water barriers as required to protect site and abutting properties from soil erosion and water run-off.
- D. Sanitary Facilities: The Contractor shall provide and maintain in a sanitary condition temporary toilets, wash facilities and drinking water fixtures complying with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities.
1. Toilets shall be enclosed, weather-tight chemical type for the use of all construction personnel at locations acceptable to the Owner and governing authorities. Toilet facilities within existing building(s) may not be used by construction personnel. Permanent toilets installed under this Contract shall not be used during construction.
  2. Drinking water facilities shall be containerized tap-dispenser bottled water units, with paper cups.



3. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste container for used materials. Maintain daily in clean and sanitary condition.
- E. Temporary Heat: The Contractor shall provide temporary heat to permit construction work to be carried on during the winter months and as required by construction activities for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. These Specifications are not to be construed as requiring heat for operations that are not adversely affected by the weather.
  1. The Contractor shall maintain a minimum temperature of 40 degrees F at the working surface, unless higher temperatures are required for specific work activities. This provision does not supersede any specific requirements for methods of construction, curing of materials, or the applicable General Conditions set forth in the Contract Documents with added regard to performance obligations of the Contractor.
  2. During the progress of the Work and at all times prior to the date of Substantial Completion, the Contractor shall provide temporary heat as required to prevent damage to completed work, work in progress or stored materials.
    - A. The Contractor shall provide independent temporary heating, ventilation, and cooling systems and shall pay all costs, including fuel and power, related thereto.
  3. During the progress of the Work and at all times prior to the date of Substantial Completion, the Contractor shall provide and pay all costs related to temporary heat as required to prevent damage to completed work, work in progress or stored materials.
    - a. The Contractor shall furnish and install one accurate recording Fahrenheit thermometer at a place designated by the Architect, and one additional accurate thermometer for every 5000 square feet of floor space, located as directed by the Architect in order to determine if the specified temperatures are maintained.
  4. The Contractor may, where applicable and with the approval of the Owner, elect to use the permanent new heating, ventilation, and cooling system as specified for the project once it has been tested and is ready to operate. Should the permanent new system be allowed for use as temporary heat during construction, the Contractor shall pay for all operation and maintenance and fuel / power related to such use. Upon Substantial Completion, filters shall be replaced and the system shall be cleaned and adjusted. Such cleaning shall include the insides of all ductwork used during construction and intended to remain in operation.
    - a. The entire system shall be returned to suitable conditions in accordance with the HVAC protection measures described in Section 01 57 21 Indoor Air Quality Controls. The Contractor shall verify that his use of new systems during construction will not diminish applicable warranties.
    - b. All return air ductwork shall be protected with MERV 13 or better filters to prevent construction debris from entering ducts or units.
- F. Operating labor shall be provided by the Contractor for all heating, ventilation, and cooling equipment. Operating labor shall include frequent inspection, emergency repairs, and maintaining temperature records. The Contractor shall provide continuous direct attendance as appropriate or otherwise required by governing authorities.
  1. The installation and operation of heating devices used hereunder shall comply with all safety regulations, including provisions for adequate ventilation, cooling, and fire protection. Select safe equipment that will not have a harmful effect on completed installation or elements being installed. Coordinate ventilation requirement to produce the ambient condition required and minimize consumption of energy. Use of gasoline burning space heaters, open flame, or salamander type heating units is prohibited. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes vapors, or gases.
  2. Fuel-fired tools shall not be used in finished areas. Use of fuel-fired tools shall be limited to framed-only open areas and unfinished areas that are properly ventilated with 100% outdoor air.

- G. Temporary Ventilation: Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

### **3.03 TEMPORARY SUPPORT FACILITIES INSTALLATION**

- A. Storage Trailers: Existing facilities and/or new construction shall not be available for this purpose.
1. All field offices and storage trailers located within the construction area, or within 30 feet of building lines shall be of non-combustible construction, complying with requirements of NFPA 241.
  2. Construction shanties, sheds, and temporary facilities provided as required above or for the Contractor's convenience shall be located as approved by the Owner and governing authorities and maintained in good condition and neat appearance.
- B. Temporary Roads and Parking: Construct and maintain temporary roads to adequately support loading and withstand exposure to traffic during the construction period. If possible, locate temporary roads, storage areas, and parking where the same permanent facilities will be located. Coordinate temporary road development with sub-grade grading, compaction, installation and stabilization of sub-base, and installation of base and finish coats of permanent paving. Extend temporary roads in and around the construction area as necessary to accommodate delivery and storage of material, equipment usage, administration, and supervision. Plan installation of the final course of permanent paving after all heavy truck traffic and immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
- C. Temporary Traffic Control: Provide temporary traffic control at the junction of temporary roads with public roads, including, but not limited to, warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of local or state traffic authorities. Provide all necessary equipment, flag people, or special police, as required by traffic authorities having jurisdiction.
- D. Temporary Stairs, Lifts, and Hoists: The Contractor shall furnish and maintain all equipment such as temporary stairs, ladders, ramps, scaffolds, runways, chutes, etc., as required for the proper execution of the Work, unless specifically included under the Work of other trades.
1. All such apparatus, equipment, and construction shall meet all requirements of applicable laws, regulations, and standards of safety and good practice.
  2. Until permanent stairs are available, provide temporary stairs where ladders are not adequate. As soon as permanent stairs are erected, the Contractor shall provide temporary protective treads, and handrails.
  3. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the Work shall be furnished, installed, operated, and maintained in safe condition by the Contractor for the use of all subcontractors' material and/or equipment delivered to the designated hoisting area. All costs for such equipment operating services shall be paid by the Contractor.
  4. In the event that a particular subcontractor has certain specific requirements which are peculiar to his needs, and which cannot be satisfied with the hoist provided by the Contractor, the subcontractor shall provide, maintain, operate, and pay for hoisting equipment necessary for the proper execution and completion of his work.

### **3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, the Contractor shall provide and maintain in good operating condition temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses, and as recommended by representatives of the fire insurance company carrying insurance on the Work or by governing fire or building authorities. Comply with NFPA 10 - Standard for Portable Fire Extinguishers, and NFPA 241- Standard for Safeguarding Construction, Alterations, and Demolition Operations.
1. Flammable products shall be properly stored in containers acceptable to fire officials.

2. The area within the site limits shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.
  3. Fire extinguishers shall be located where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stair well.
  4. Maintain unobstructed access to fire extinguishers, temporary fire protection facilities, stairways, and other access routes for fighting fires.
  5. Smoking shall be strictly prohibited on the construction site.
  6. Provide supervision of welding operations, soldering operations, combustion type temporary heating units, and similar sources of fire ignition.
- B. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- C. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result. Minimize the use of tools and equipment that produce excessive noise and restrict their use to hours that will minimize complaints from persons near the site.
- D. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
1. All cavities of masonry construction and masonry construction containing uncured mortar shall be covered during rainy conditions and at the end of a day's work.
  2. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilation and material drying or curing requirements to avoid dangerous conditions and effects. This protection shall provide adequate working areas during winter months, consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations.
  3. Install tarpaulins securely, with non-combustible wood framing and other materials. Close openings 25 sq. feet or less with plywood or similar materials.
  4. Close openings through floor or roof decks and horizontal surfaces with load-bearing temporary construction. Where temporary wood or plywood is used and exceeds 100 sq feet in area, use fire-retardant treated framing and plywood.
- E. Protective Covering of the Work: The Contractor shall protect all finished surfaces, including the jambs and soffits of all openings used as passageways or through which materials are handled, against any possible damage resulting from the conduct of work by all trades.
1. All finished surfaces, including factory-finished and job-finished items, shall be clean and not marred upon delivery of the building to the Owner. The Contractor shall, without extra compensation, refinish all spaces where such surfaces prove to have been inadequately protected and are damaged.
  2. Tight wood sheathing shall be laid under any materials that are stored on or moved over finished surfaces. Reinforced non-staining kraft building paper and plywood or planking shall be laid over all types of finished floor surfaces, including concrete to remain exposed, in traffic areas before moving any material over these finished areas. Wheelbarrows, if used over such areas, shall have rubber-tired wheels.
  3. Roof surfaces shall not be subjected to unnecessary traffic nor shall they be used for storage of material. Wherever such activity must take place in order to carry out the Work of the Contract, adequate protection shall be provided.
  4. Prohibit traffic on grass and landscaped areas.



- F. Temporary Tree and Plant Protection: The Contractor shall provide temporary fencing adequate to properly protect existing trees to remain specifically identified on the Drawings during construction. Fencing shall be located at each tree's drip line in order to protect the tree's root structure as well as its trunk and branches. Damaged trees shall be replaced in-kind at the Contractor's expense. See Section 01 56 39 – Temporary Tree and Plant Protection.
- G. Worker I.D. Badges: The Contractor shall provide worker I.D. badges for all personnel present on the site involved with the Project. A list shall be maintained in the field office, identifying workers with their assigned badge number. Badges shall be prominently displayed at all times when on-site.

### **3.05 TERMINATION AND REMOVAL**

- A. Remove temporary facilities when the need has ended, or when replaced by authorized use of permanent facilities.
- B. Materials and facilities that constitute temporary facilities are the property of the Contractor.
- C. Remove temporary roads that are not intended or acceptable for integration into permanent roads. Remove soil and fill that does not comply with requirements for fill in these areas. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials. Repair or replace street paving and curb at the temporary entrances, as required by the governing authority.
- D. At Substantial Completion, clean and restore permanent facilities that have been used during construction, including but not limited to, replacing air filters, cleaning ductwork, and replacing lamps effected by substantial use.

**END OF SECTION**

**SECTION 01 56 39**  
**TEMPORARY TREE AND PLANT PROTECTION**

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

- A. This Section includes the protection and trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent construction.
- B. This includes trees to be relocated and trees along adjacent property to be protected.

**1.02 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- C. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
- D. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

**1.03 QUALITY ASSURANCE**

- A. Arborist Qualifications: An arborist certified by ISA or licensed in Maine.
- B. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.
- B. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1/2 in. diameter; and free of weeds, roots, and toxic and other nonsoil materials.
  - 1. Obtain topsoil only from well-drained sites where topsoil is 4 inches deep or more; do not obtain from bogs or marshes except for wetland creation areas. Avoid and do not obtain topsoil where extensive weeds or bamboo have grown in the past.
- C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.
- D. Orange Safety Fence: Open web polypropylene fence with a 4'-0" height. Support with 8'-0" long #6 rebar driven at 6'-0" on center; 4'-0" into ground. Secure fence to rebar with cable ties.
- E. Organic Mulch: Wood and bark chips, free from deleterious materials.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.

- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Mulch areas inside tree protection zones and within drip line of trees to remain and other areas indicated.
  - 1. Apply average thickness of organic mulch. Do not place mulch within 6 inches of trunks.
- D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.

### **3.02 EXCAVATION**

- A. Install shoring or other protective support systems to minimize sloping or benching of excavations.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.
  - 1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp instruments; do not chop.

### **3.03 REGRADING**

- A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond tree protection zones. Maintain existing grades within tree protection zones.
- B. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.
- C. Moderate Fill: Where existing grade is more than 6 inches but less than 12 inches below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
  - 1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
  - 2. Place filter fabric with edges overlapping 6 inches minimum.
  - 3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

### **3.04 TREE PRUNING**

- A. Prune trees to remain that are affected by temporary and permanent construction.
- B. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
- C. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
  - 1. Type of Pruning: Cleaning and Thinning.
  - 2. Specialty Pruning: Vista.
- D. Cut branches with sharp pruning instruments; do not break or chop.
- E. Chip removed tree branches and stockpile in areas approved by Architect.

### **3.05 TREE REPAIR AND REPLACEMENT**

- A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.

### **3.06 DISPOSAL OF WASTE MATERIALS**

- A. Burning is not permitted without local approval of the Rockland Fire Department.
- B. Disposal: Remove excess excavated material and displaced trees from Owner's property.

### **END OF SECTION**

**SECTION 01 57 21**  
**INDOOR AIR QUALITY CONTROLS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Construction procedures to promote adequate indoor air quality during and after construction.
- B. Owner's testing of indoor air quality before commencement of construction in existing building areas for comparison of ventilation intake protection.

**1.02 PROJECT GOALS**

- A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
  - 1. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
- B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
  - 1. Furnish products meeting the specifications.
  - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

**1.03 REFERENCE STANDARDS**

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2012.
- B. ASHRAE Std 62.1 - Ventilation For Acceptable Indoor Air Quality; 2012.
- C. ASHRAE Std 129 - Measuring Air-Change Effectiveness; 1997 (Reaffirmed 2002).
- D. ASTM E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization; 2010.
- E. SMACNA (OCC) - IAQ Guideline for Occupied Buildings Under Construction; 2007. (Workers)

**1.04 DEFINITIONS**

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA IAQ Guidelines for Occupied Buildings Under Construction as a guide.
  - 1. Submit not less than 60 days before enclosure of building.
  - 2. Identify potential sources of odor and dust.
  - 3. Identify construction activities likely to produce odor or dust.
  - 4. Identify areas of project potentially affected, especially occupied areas.
  - 5. Evaluate potential problems by severity and describe methods of control.



6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems (if permitted by the Owner), types of filters and schedule for replacement of filters.
  7. Describe cleaning and dust control procedures.
- C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times. If necessary, schedule offensive odor and vapor work off hours from other trades.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Low VOC Materials: See other Sections for specific requirements for materials with low VOC content.
- B. Auxiliary Air Filters: MERV of 13, minimum, when tested in accordance with ASHRAE 52.2.

## **PART 3 EXECUTION**

### **3.01 CONSTRUCTION PROCEDURES**

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
  1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
  2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
  3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.
- D. Provide ventilation and/or pressurization to prevent construction dirt and fumes from entering occupied areas of existing building (adjacent school).
- E. HVAC equipment and ductwork is intended to NOT be used for ventilation during construction:
  1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
  2. Exhaust directly to outside.
  3. HVAC ductwork shall be kept clean, free of dust during storage, handling and installation. Seal HVAC air inlets and outlets immediately after duct installation with tape and plastic sheeting. All seams in ductwork shall be sealed.
  4. See Section 01 50 00 Temporary Facilities for use of HVAC systems during construction.
- F. All inspection and filter replacement shall occur with the HVAC equipment turned off.
- G. Do not store construction materials or waste in mechanical or electrical rooms.
- H. Prior to use of return air ductwork, clean up and remove dust and debris generated by construction activities.
  1. Inspect duct intakes, return air grilles, and terminal units for dust.
  2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
  3. Clean tops of doors and frames.
  4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
  5. Clean return plenums of air handling units.
  6. Remove intake filters last, after cleaning is complete.
- I. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- J. Use other relevant recommendations of SMACNA IAQ Guideline for Occupied Buildings Under Construction for avoiding unnecessary contamination due to construction procedures.

**3.02 AIR CONTAMINANT TESTING**

- A. The Owner shall perform air testing as it relates to HAZMAT removal, if required.

**END OF SECTION**

**SECTION 01 60 00  
PRODUCT REQUIREMENTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products and equipment.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations and procedures.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

**1.02 RELATED REQUIREMENTS**

- A. Document 00 21 13 - Instructions to Sub-bidders: Product options and substitution procedures prior to bid date.
- B. Section 01 00 00 - General Requirements.
- C. Section 01 40 00 - Quality Requirements: Product quality monitoring.
- D. Section 01 74 19 - Construction Waste Management and Disposal.

**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. See Section 01 30 00 - Administrative Requirements, for more information regarding product data submittals.
- 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. See Section 01 30 00 - Administrative Requirements, for more information regarding Shop Drawings.
- 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 the Contract Documents.
- B. Unless specifically indicated otherwise, the following listed existing materials resulting from demolition, where applicable, shall remain the property of the Owner. Such materials shall be carefully removed so as to limit unnecessary damage and shall be properly stored on-site at location(s) designated by the Owner. In general, these materials shall not include basic building materials such as concrete, masonry, steel, wood framing, plaster, gypsum board, etc. Specifically, these materials include:
  - 1. Flag and flag pole
  - 2. Air compressor(s)
  - 3. Identified shop (educational) equipment, IT and AV equipment

4. Kitchen and Food Service Equipment
5. The determination of whether or not materials are to be considered “useful” shall be left solely to the discretion of the Owner. All materials not determined to be “useful” shall be removed from the site and properly disposed of off-site at no additional cost to the Owner.

## **2.02 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Do not use products made using or containing CFCs or HCFCs.

## **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 with product model: Use a product of one of the manufacturers named; no substitutions if so indicated; substitutions by following substitution procedures.
- C. Products Specified by Naming One manufacturer with other acceptable manufacturers listed without product model: Submit a request for substitution following substitutions procedures.

## **2.04 MAINTENANCE MATERIALS**

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual Specification Sections.

# **PART 3 EXECUTION**

## **3.01 SUBSTITUTION PROCEDURES**

- A. Substitutions are changes, modifications or deviations in those products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after the receipt of Bids. Substitutions for the convenience of the Contract or subcontractors, or materials suppliers will only be considered if submitted prior to the receipt of Bids, in strict conformance with the Instructions to Sub-bidders. The following shall not be considered substitutions:
  1. Changes, modifications, or deviations requested by Bidders during the bidding period and accepted prior to the receipt of Bids shall be considered as included in the Contract Documents and are not subject to the requirements of this Section.
  2. Revisions to Contract Documents requested by the Owner or Architect.
  3. Specified options of products or materials included in the Contract Documents.
  4. The Contractor's compliance with governing regulations and orders issued by governing authorities, subject to the Architect's prior written notice and approval.
- B. Substitution Requests: Request for substitution will be considered only if, in the opinion of the Architect, such substitution will be of benefit to the Owner. Substitution requests after receipt of bids will not be considered solely related to an “or approved equal” clause in the Contract Documents.
  1. The Contractor's substitution request will be considered by the Architect when all the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action.
    - a. Extensive revision to the Contract Documents are not required.
    - b. Proposed changes are in keeping with the general intent of the Contract Documents.
    - c. The request is timely, fully documented, and properly submitted.
    - d. In addition to the above conditions, one or more of the following conditions must be satisfied, as determined by the Architect. The Contractor shall provide written documentation for each condition noted.
      - 1) The specified product cannot be provided within the Contract Time. However, the request will not be considered if the specified product cannot be provided as



- a result of the Contractor's failure to submit to the Architect or order from the manufacturer in a timely fashion.
- 2) The specified product cannot receive necessary approval of governing authority and the requested substitution can be approved.
  - 3) A substantial advantage is offered to the Owner, in terms of cost savings, time savings, energy conservation, or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
  - 4) The specified product cannot be provided in a manner that is compatible with or coordinated with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
  - 5) The specified product cannot provide the warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
- C. Substitution Request Procedure: Complete the Contractor's Substitution Request form provided at the end of this Section. Submit the form with all required information electronically or by three (3) hard copies for each request for substitution. Incomplete forms will not be reviewed.
- D. Architect's Action: Within five (5) working days of receipt, the Architect will request additional information to evaluate the substitution if any is required. Within ten (10) working days of receipt of all necessary information, the Architect will notify the Contractor of acceptance or rejection of the proposed substitute. If a decision on the use of a proposed substitute is not or cannot be made or obtained within the time allocated, the Contractor shall use the specified product. Acceptance will be in the form of a Change Order.
- E. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this Section.
- F. A request for substitution 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.
  2. Will provide the same or better warranty for the substitution as for the specified product.
  3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
  4. Waives claims for additional costs or time extension that may subsequently become apparent.
- G. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

### **3.02 OWNER-SUPPLIED PRODUCTS**

- A. Owner's Responsibilities: Deliver products to site in accordance with the progress schedule.
- B. Contractor's Responsibilities:
1. Review Owner provided shop drawings, product data, and samples. Submit to the Architect with notification of any observed discrepancies or problems anticipated due to the Contract Documents.
  2. Receive and unload products at site; inspect for completeness or damage jointly with Owner. Record shortages, and damaged or defective items.
  3. Install blocking and supports as required for proper installation. This includes, but is not limited to, the following:
    - a. White Boards
    - b. Audio Visual equipment
    - c. Shop (educational) equipment (for all career and technical programs)
    - d. Integrated Technology (IT) and Telephone equipment

4. Handle, uncrate, store, assemble, install, connect, adjust and finish products.
  5. Protecting products from damage and from exposure to the elements.
  6. After receipt, repair or replace items damaged the Contractor or persons under his control.
- C. Existing equipment to be removed and relocated by the Contractor, includes but is not limited to:
1. Flag and flag pole
  2. Air compressor(s)
  3. Identified shop (educational) equipment, IT and AV equipment
  4. Kitchen and Food Service equipment

### **3.03 TRANSPORTATION AND HANDLING**

- A. The Contractor shall be responsible for the proper protection from damage of all materials and equipment prior to and following their incorporation into the Work. Materials and equipment shall be inspected by the Contractor
- B. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- C. Transport and handle products in accordance with manufacturer's instructions.
- D. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- E. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, products are undamaged and if found to be damaged or otherwise unsuitable shall be promptly rejected.
- F. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange for the return of packing materials, such as wood pallets, where economically feasible.
- H. All materials stored on or off the site shall be kept in secured, weather-tight enclosures, and the Contractor shall correct, at no additional cost to the Owner, any damages resulting from his failure to provide proper protection. Such corrective work shall include total replacement if so required by the Architect.
- I. The Contractor shall exercise caution in temporarily loading materials on floors, decks, roofs, etc. It shall be the Contractor's responsibility to determine the size of loads to be imposed and the adequacy of the affected structure to support such loads. The Contractor shall correct, at no additional cost to the Owner, any resultant damages.

### **3.04 STORAGE AND PROTECTION**

- A. 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.
- B. Store and protect products in accordance with manufacturers' instructions and recommendations.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Prevent contact with material that may cause corrosion, discoloration, or staining.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

- I. 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**

**CONTRACTOR'S SUBSTITUTION REQUEST**

To Architect: \_\_\_\_\_ Date: \_\_\_\_\_

From Contractor: \_\_\_\_\_ Number: \_\_\_\_\_

Specification Section: \_\_\_\_\_ Page: \_\_\_\_\_

Article / Paragraph: \_\_\_\_\_

1. Product data for proposed substitution to include: Description of product, reference standards, performance, and test data.

Sample attached: Yes \_\_\_ No \_\_\_ To be sent if requested by Architect Yes \_\_\_ No \_\_\_

2. Itemized comparison of proposed substitution with product specified is attached.

## ORIGINAL PRODUCT

## PROPOSED SUBSTITUTION

Trade Name, Model: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Installer: \_\_\_\_\_

History of proposed substitution: New product \_\_\_ 2-5 years old \_\_\_ 5-10 years old \_\_\_ &gt; 10 years old \_\_\_

Significant variations of proposed substitution from original product: No \_\_\_ Yes \_\_\_

Proposed substitution affects other parts of the Work: No \_\_\_ Yes, explain \_\_\_\_\_

Similar installations within 150 miles: Provide project name, address, architect, install date: \_\_\_\_\_

Reason for not providing specified item: \_\_\_\_\_

3. Savings to Owner for accepting substitution: \$ \_\_\_\_\_

Proposed substitution changes Contract Time: No \_\_\_ Yes \_\_\_ Add/Deduct \_\_\_\_\_ days.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior to the specified product.
- Same warranty will be furnished for proposed substitution as for the specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated herein is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions, functional clearances or design appearance.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: \_\_\_\_\_

Attachments: \_\_\_\_\_



**SECTION 01 70 00.01**  
**SITE PERMIT REQUIREMENTS**

**PART 1 - GENERAL**

- A. Construction of this project must meet the terms and conditions if the requirements of the Stormwater Law and Erosion and Sedimentation Control Law of the State of Maine Site, the Natural Resources and the City of Rockland Site Plan Review findings of fact and conditions. The Owner has applied for these permits. The aforementioned permits shall be the extent of Owner supplied permits. Any other permits required to conduct the work shall be obtained by the Contractor.
- B. Copies of the Permit Applications and correspondence during review of the permits may be inspected during normal working hours at the office of the Architect.
- C. Any Contractor who desires to view the Permit Applications and Associated Correspondence must contact the Architect 48 hours prior to inspecting the information.
- D. Certain conditions of the permits will be the responsibility of the Contractor. The specific condition for which the Contractor is responsible to include:
  - 1. Maine DEP Stormwater Law Permit by Rule: The Contractor will be expected to comply with:
    - a) **General** Notification requirements of the permit and general conditions. The contractor shall provide a copy of the permit to any subcontractors or bidders.
    - b) **Execution requirements** Active maintenance of site stabilization, materials storage and protection, erosion and sedimentation control measures requirements of the rules, and the related performance conditions.All other conditions of the permit are anticipated to be the responsibility of the Owner.
  - 2. Maine DEP Natural Resources Protection Act Permit by Rule: The Contractor will be expected to comply with:
    - a) **General** use of a contractor certified in erosion control practices by the State of Maine. Certification shall be a contract requirement. The contractor shall provide a copy of the permit to any subcontractors or bidders.
    - b) **Execution requirements**. Conform to standard conditions of permit.
  - 3. Rockland Site Plan approval: The Contractor will be expected to comply with:
    - a) **General** Provide adequate off-street parking and other good neighbor measures to reduce impact on adjoining residential properties.
    - b) **Execution requirements**. Conform to hours of operation and noise standards of city ordinances.All other conditions of the permit are anticipated to be the responsibility of the Owner.

**PART 2 - PERMITS**

- A. The Permit by Rule forms for Stormwater Law and NRPA will be issued by Addendum.
- B. The City of Rockland Planning Board findings and conditions will be issued by Addendum.

**END OF SECTION**

**SECTION 01 71 00  
CUTTING AND PATCHING****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work Included in This Section:
  - 1. Provide all labor, materials, equipment and services, etc., required for all cutting (including excavation), removal, fitting, patching, and/or repairs as required to:
    - a. Make the several parts fit properly.
    - b. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
    - c. Remove and replace work not conforming to requirements of the Contract Documents.
    - d. Remove and replace defective work.
- B. Related Work:
  - 1. In addition to other requirements noted or specified, upon the Architect's request uncover work to provide for observation by the Architect of covered work, and remove samples of installed materials for testing.
  - 2. Do not cut or alter work performed under separate contracts without the Architect's written permission.
  - 3. Maintaining and amending fire ratings of building components.

**1.02 SUBMITTALS**

- A. Where cutting and/or patching is required, the Architect's review of proposed cutting and patching procedures is required. The following information shall be included in the submission prior to proceeding with cutting:
  - 1. Clearly describe the extent of cutting and patching required and how it is to be performed. Layout the work on-site as appropriate. Indicate why it cannot be avoided.
  - 2. Describe the anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components and changes in the building's appearance and other visual elements.
  - 3. List products to be used and firms that will perform the Work. Indicate dates for cutting and patching. Submit samples of actual materials to be used for patching.
  - 4. List any utilities that will be disturbed, relocated, made temporarily out-of-service, and indicate the length of service disruption.
  - 5. Where cutting and patching involves the addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the installed structure.
- B. Acceptance of the cutting and patching proposal by the Architect does not waive the Architect's right to later require complete removal and replacement of Work found to be unsatisfactory, nor does it alter the Contractor's sole responsibility for the safe and proper execution of all cutting and patching.
- C. Submit written notice to the Architect designating the time the Work will be uncovered, to provide for the Architect's observation.

**1.03 QUALITY ASSURANCE**

- A. Structural Work: Do not cut and patch structural elements in a manner that would reduce their structural characteristics such as load-carrying capacity or load deflection ratio.
  - 1. Obtain approval of the cutting and patching proposal before cutting and patching structural elements, including but not necessarily limited to:
    - a. Foundation construction.
    - b. Bearing and retaining walls.
    - c. Structural concrete.
    - d. Structural steel.

- e. Hung and loose lintels.
  - f. Structural decking.
  - g. Stair systems.
  - h. Miscellaneous structural metals.
  - i. Equipment supports.
  - j. Piping, ductwork, vessels, and equipment.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety components in a manner that would reduce their capacity to perform as intended, or would increase maintenance, or decrease operational life or safety.
- 1. Obtain approval of the cutting and patching proposal before cutting and patching operating elements or safety related systems, including but not necessarily limited to:
    - a. Shoring, bracing, and sheeting.
    - b. Primary operational systems and equipment.
    - c. Fire separation assemblies.
    - d. Fire-rated and non-fire-rated smoke barriers.
    - e. Water, moisture, or vapor retarders.
    - f. Membranes and flashings.
    - g. Fire protection systems.
    - h. Noise and vibration control elements and systems.
    - i. Control systems.
    - j. Voice, video, and data systems.
    - k. Conveying systems.
    - l. Electrical wiring systems.
- C. Miscellaneous: Do not cut and patch elements in a manner that would reduce their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- 1. Obtain approval of the cutting and patching proposal before cutting and patching building elements, including but not necessarily limited to:
    - a. Water, moisture or vapor barriers.
    - b. Membranes and flashings.
    - c. Exterior curtain wall construction.
    - d. Noise and vibration control elements and systems.
  - 2. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.
- D. Remove, replace, patch and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void warranties.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. For replacement of items removed, use materials identical to previously installed materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match adjacent surfaces to the fullest extent possible, subject to Architect's approval. Use materials whose performance will equal or surpass that of existing materials.

### **2.02 PAYMENT FOR COSTS**

- A. Perform cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.
- B. All costs resulting from ill-timed or defective work, or work otherwise not conforming to the Contract Documents shall be borne by the Contractor.

**PART 3 - EXECUTION****3.01 SURFACE CONDITIONS**

- A. Inspection: Inspect existing site conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
- B. After uncovering the work, inspect conditions affecting installation of new work.
- C. Prior to proceeding, meet with all parties involved in cutting and patching including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- D. Discrepancies: If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions. Do not proceed until unsatisfactory conditions are corrected.

**3.02 PREPARATION PRIOR TO CUTTING**

- A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.
- B. Protect adjacent construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Work that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas. Take all precautions to avoid cutting existing pipe, conduit, or utilities serving the existing adjacent building, but scheduled to be removed or relocated until provisions have been made to bypass them.
- D. Provide proper dirt, dust, fume, vapor, and noise control.
- E. Verify the conditions and requirements of all existing warranties that may be affected by cutting and patching (such as newly water line installation warranties). It is the intent that all cutting and patching be performed in a manner that preserves all such warranties in full, without compromise.

**3.03 PERFORMANCE**

- A. General: Cutting and patching shall be kept to an absolute minimum by careful planning and through proper holes, sleeves, anchors, inserts, or other built-ins as the Work progresses.
- B. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
- C. The Contractor shall properly restore work that has been cut or removed and install new products to provide completed work in accordance with the requirements of the Contract Documents.
- D. Cutting: Perform cutting and demolition by methods least likely to damage elements to be retained or adjoining construction and that will provide proper surfaces to receive installation of repair and new work. Where possible, review procedures with the original installer. Comply with the original installer's recommendations.
- E. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- F. To avoid marring finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
- G. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill. Tooth-in new masonry where exposed to view, when needing to cut or core newly installed masonry.
- H. Perform necessary excavating and backfilling as required under pertinent other Sections of these Specifications.
- I. By-pass utility services such as pipe or conduit, before cutting, where services are shown, or removal required, relocated, or abandoned. Cut off pipe or conduit in walls or partitions, to be



removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting. The existing School, adjacent to the construction site, shall remain in full operation with fully functional utilities at all times.

- J. Patching: Perform fitting and adjusting of products as required to provide finished installations complying with the specified tolerances and finishes or otherwise satisfactory to the Architect.
- K. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
- L. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
- M. Where patching occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch, after the patched area has received primer and first coat.
- N. Patch, repair, or re-hang ceilings, as necessary to provide an even plane surface of uniform appearance. Do not patch or splice new ceiling systems as a solution.
- O. At penetrations in fire-resistive rated walls, partitions, ceilings, floors, or roof construction, completely seal voids with firestopping materials in compliance with Section 07 84 00 - Firestopping.
- P. Failure to protect installed materials and systems may require entire areas to be replaced, rather than cut and patched due to damage caused by construction.

#### **3.04 CLEAN-UP**

- A. All debris and rubbish shall be properly removed from the premises as it occurs. All materials shall be properly disposed of off-site, in strict accordance with all applicable Laws, Rules, Regulations, and Ordinances.
- B. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean surfaces before painting or finishing.

**END OF SECTION**

**SECTION 01 74 19**  
**CONSTRUCTION WASTE MANAGEMENT**

**PART 1 GENERAL****1.01 WASTE MANAGEMENT REQUIREMENTS**

- A. Owner requires that this Project manage the disposal of trash and waste properly and in a legal manner.
- B. Employ processes that minimize the generation of waste due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Protect construction waste materials from organic trash to avoid contamination of waste material and maximize waste recycling.
- D. Construction waste shall be sent to a certified recycling facility for sorting to recycle and reuse whenever possible. Any loads contaminated with municipal solid waste shall be taken to a municipal transfer station for off loading and trucking to a certified recycling facility. Materials that cannot be recycled or reused shall be land-filled.
- E. Demolition debris shall be sent to a certified recycling facility for sorting to recycle, reuse and remainder to landfill.
- F. 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-site or off-site.
- H. 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 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, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity and listed as a regulated material in the State of ME.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.

- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

### **1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Waste Management Plan: Within 10 calendar days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs sooner, submit a waste management plan. Include the following information:
  - 1. Name and address of certified recycling facility for this Project.
  - 2. Name, address, and telephone number of the landfill(s) where all non-recyclable trash/waste will be disposed of.
  - 3. Describe efforts to address waste prevention, reduction, recycling, salvage, reuse, and disposal.

## **PART 2 PRODUCTS (Not Used)**

## **PART 3 EXECUTION**

### **3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION**

- A. Keep trash/waste collection areas neat and clean.
- B. Do not handle, separate, store, salvage, or recycle hazardous materials. Contact Owner if hazardous materials are encountered.

**END OF SECTION**

**SECTION 01 78 00  
PROJECT CLOSE-OUT****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Substantial Completion procedures.
  - 1. Project Close-out meeting.
  - 2. Occupancy Permit.
- B. Project Record Documents.
  - 1. Record Drawings.
  - 2. List of Subcontractors and material suppliers.
  - 3. Operation and Maintenance Data.
  - 4. Warranties and bonds.
  - 5. Contractor's Certificate of No Hazardous Materials.
  - 6. Testing Agency Final Report.
  - 7. Commissioning Agent Final Report
- C. Architect's evaluation of the Work.
- D. Final Acceptance procedures.
- E. Operating and Maintenance Instructional Sessions.
- F. Adjustments.
- G. Final Cleaning.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 72 00 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 00 00 - General Requirements.
- C. Section 01 00 30 - Electronic Media: Record Drawing backgrounds.
- D. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- E. Section 01 40 00 - Quality Services: Final Test Reports.
- F. Section 01 78 10 - Warranties: General warranty requirements.
- G. Individual Product Sections: Specific requirements for operation and maintenance data.
- H. Individual Product Sections: Warranties required for specific products or Work.

**1.03 SUBSTANTIAL COMPLETION PRELIMINARY PROCEDURES**

- A. Prior to requesting evaluation of the Work for certification of Substantial Completion, the Contractor shall complete the following items.
- B. Close-out Meeting: Not less than ninety (90) days prior to the anticipated date of Substantial Completion, the Contractor shall conduct a Project close-out meeting. Participants in the meeting shall include the Contractor, Owner and Architect. The Contractor shall prepare the agenda and schedule of close-out tasks, for prior distribution, which, among other items as may be determined by the Contractor, shall include, but not be limited to the following:
  - 1. HVAC Start-up Activities.
    - a. Air and water balancing.
    - b. Controls sequence check.
    - c. HVAC filter replacement.
    - d. Cleaning of ductwork used during construction.
  - 2. Programming and training of Energy Management System.



3. HVAC and Lighting System Commissioning.
4. Indoor Air Quality Testing, as applicable.
5. Testing and Inspections with Authorities Having Jurisdiction:
  - a. Fire alarm system test
  - b. Generator and transfer switch test
  - c. Sprinkler system testing
  - d. Range hood suppression system testing
  - e. Fire doors and fire shutters
  - f. Elevator and lift testing and inspection
  - g. Health Department food service inspections
  - h. Certificate of Occupancy inspection
6. Other Testing.
  - a. Door Access Control system (Contractor's hardware and controls).
  - b. PA and Clock system.
  - c. Data and Telephone distribution systems.
  - d. Laboratory equipment.
  - e. Security and CCTV
7. Owner's Equipment Testing.
  - a. Telephone equipment.
  - b. Computer network equipment.
  - c. Audio-visual equipment.
8. Delivery of tools, spare parts, extra stock, etc.
9. Punch Lists:
  - a. Contractor Initial Draft.
  - b. Architect / Owner reviewed and amended List.
10. Final Cleaning Operations.
11. Transition Security Issues.
  - a. Removal of construction trailers, fencing, gates, etc.
  - b. Door key change-over
  - c. Locker key & combination listing and turn-over
  - d. Miscellaneous key turn-over (casework, millwork, toilet accessories, gas valves, F.D. security key box, sewer pump station, display cases, etc.)
12. Transition Issues.
  - a. Insurance change-over.
  - b. Owner's schedule for move-in of furnishings and equipment
  - c. Contractor's move-in of existing equipment to be re-used.
13. Instructional Sessions:
  - a. Mechanical, sprinkler and electrical systems.
  - b. Door hardware, windows, and window operators
  - c. Operable walls
  - d. Food service equipment
  - e. Laboratory equipment
  - f. Elevators and lifts.
  - g. Etc....
14. Record Information:
  - a. Warranty binder
  - b. Record Drawings
  - c. O&M manuals
  - d. Food service & laboratory equipment binders
15. Close-out Paperwork:
  - a. Release of Liens
  - b. Consent of Surety
  - c. Certification of No Hazardous Materials

- d. Testing Agency Final Report
- e. Commissioning Agent Final Report
- C. Contractor's Punch List: Prior to review of a punch list by the Owner and Architect, the Contractor shall prepare a comprehensive punch list, and along with his subcontractors, properly complete all Work items thereon. The receipt of the Contractor's submitted punch list, clearly identifying all completed and pending items, shall be considered a prerequisite for the commencement of the Owner and Architect's evaluation of the Work for Substantial Completion. The Architect and Owner will then evaluate the work and amend the listed pending items on the Contractor's List with any items that are found to be in non-compliance with the Contract.
- D. Advise Owner of pending insurance and utility change-over requirements.
- E. Submit warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
- F. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities, including Occupancy Permits, operating certificates and similar releases. If the Project is completed in phases, obtain Occupancy Permits as required by governing authorities.
- G. Deliver tools, spare parts, extra stock, and similar items.
- H. Make final change-over for locks, keys, and other security provisions.
- I. Complete start-up testing of equipment and systems, conduct Owner's training sessions.
- J. Discontinue, change over and remove temporary facilities from the site. Remove temporary protection measures provided during construction.
- K. Final Cleaning.
- L. Certificate of Occupancy: The Contractor shall schedule various inspections with the Authority Having Jurisdiction as required to obtain a Certificate of Occupancy.

#### 1.04 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with submission for final Application for Payment.
  - 1. Record Drawings: Required for all Site Utilities, Site Drainage, Architecture, Building Structure, Mechanical Systems, Fire Protection Systems and Electrical Systems.
    - a. The Contractor shall maintain one set of Contract Drawings for use in the preparation of Record Drawings. This set shall be maintained at the site, and upon them, the Contractor shall clearly and accurately record all Addenda, Supplementary Instructions, Change Orders, Architect's responses to Contractor's Requests for Information, and all significant changes made during construction to the Work hereinafter listed.
    - b. Upon completion of the Contract, and as a prerequisite to final Payment, the Contractor shall prepare (draft as necessary), check, and certify the Record Drawings for completeness and accuracy and submit them to the Architect. The Contractor's submittal shall include one set of CD Rom electronic media files and one set blackline hard copy Record Drawings. The Contractor shall imprint the following text on each Record Drawing and Record Drawing Electronic Media File:
      - 1) NOTE: This drawing has been produced by (name and address of contractor). It is not the originally designed Contract Document. It is a Record Drawing."
      - 2) See Section 01 00 30 - Electronic Media for information regarding obtaining electronic Contract Documents for use in preparing for Record Drawings.
    - c. The Architect will casually review such drawings, but will in no way ascertain or certify their completeness or correctness, which shall remain the sole responsibility of the Contractor. The Architect shall be entitled to rely upon the thoroughness and accuracy of the Contractor's documents, without further verification. Following his review, the Architect will forward all Record Drawings to the Owner for his use.

2. Record Specifications: Submit one hard copy and one electronic marked pdf file.
  3. Record Product Data: Submit one hard copy and one electronic pdf file.
  4. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Complete miscellaneous records, place in good order, properly identified and bound ready for reference and submit to the Architect for the Owner's records.
  3. List of Subcontractors: The Contractor shall submit to the Architect two (2) typed updated lists of all subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- B. Operation and Maintenance Data:
1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
  2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten (10) days after acceptance.
  3. Submit one copy of completed documents fifteen (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.
  4. Submit two sets of revised final documents in final form within ten (10) days after final inspection.
- C. Warranties and Bonds:
1. The Contractor shall submit to the Architect two (2) typed sets, neatly bound and indexed in a loose leaf binder, of all warranties, certificates and bonds as required by the Contract Documents.
  2. For equipment or component parts of equipment put into service during construction with Owner's permission, submit a copy of documents within 10 days after acceptance. The intent is that at the end of every phase, any items placed into operation during that phase will have its warranty period start at substantial completion of that phase.
  3. Make other submittals within ten (10) days after Date of Substantial Completion, prior to final Application for Payment.
  4. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten (10) days after acceptance, listing the date of acceptance as the beginning of the warranty period. Pages shall be pre-punched for insertion into the bound set.

#### **1.05 ARCHITECT'S EVALUATION**

- A. On receipt of a written request from the Contractor, the Architect will either proceed with evaluation of the Work for Substantial Completion or advise the Contractor of requirements yet to be completed prior to evaluation.
- B. Based on his/her observations, the Architect will review the Contractor's written list, or "Punch List", of items to be corrected or to be completed. The Architect will amend the Punch List with any items found to be in non-compliance with the Contract. The amended list may not include all Work necessary for completion in accordance with the Contract Documents and shall not in any way relieve the Contractor of responsibility for compliance with the Contract Documents.
- C. The Architect shall prepare the AIA G704 Certificate of Substantial Completion form and attach the amended Punch List thereto.
- D. Work found to be incomplete or not in conformance with the Contract Documents after the Architect's evaluation shall be completed or corrected before Final Acceptance and Final Payment.
- E. When Work has been completed or corrected, the Contractor shall submit to the Architect and Owner a written request for re-evaluation. Include a copy of the Punch List with notation of action taken for each item.

**1.06 FINAL ACCEPTANCE**

- A. Within five (5) working days after the date of Substantial Completion, the Contractor shall provide a list of final Contract requirements with anticipated completion dates including:
  - 1. List of incomplete Work.
  - 2. Final Change Orders.
  - 3. Consent of Surety to final payment
  - 4. Assurances that unsettled claims will be settled.
  - 5. Record Drawings, O& M Manuals, Final Project Photos, Damage or Settlement Survey or other final record information.
  - 6. Final Application for Payment with releases and supporting documentation, including final waivers of lien.
  - 7. Written confirmation that corrective work related to any failed quality control testing has been provided, and that satisfactory retesting has been performed and approved by the testing agency.
- B. The Contractor shall complete each punchlist item within sixty (60) days of the Contractor submitting the Architect and Owner amended Punchlist. Each item shall be assigned an acceptable value by the Contractor, as amended and accepted by the Architect, for 150% of the value of the work to be completed.
- C. Re-evaluation Procedure: The Architect and Owner will re-evaluate the Work upon receipt of written notice from the Contractor that the Work, including correction of items previously noted, has been completed.
  - 1. Upon completion of re-evaluation, the Architect will prepare a Certificate of Final Acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for Final Acceptance.
  - 2. If necessary, re-evaluation for Final Acceptance will be repeated. Cost of re-evaluation will be the responsibility of the Contractor.
  - 3. If within sixty (60) days from the date of Substantial Completion, or Owner's temporary use and occupancy, the punchlist remain incomplete, the Owner at its discretion may retain the amounts assigned to the incomplete items and close out the Contract with the Contractor.

**PART 2 PRODUCTS - NOT USED****PART 3 EXECUTION****3.01 INDOOR AIR QUALITY MANAGEMENT**

- A. The Contractor and his various subcontractors as he may direct shall implement the procedures throughout construction in an effort to improve indoor air quality during the Owner's occupancy. See 01 57 21 - Indoor Air Quality Controls.

**3.02 MECHANICAL AND ELECTRICAL SYSTEMS COMMISSIONING**

- A. The Owner shall employ an independent Commissioning Authority/Agent (CxA) for Mechanical and Electrical systems commissioning. See Section 01 40 00 and Section 01 91 13. See mechanical and electrical specifications for additional information.
  - 1. Contractor shall coordinate all reporting efforts between Commissioning Agent (CxA) and Subcontractors.
  - 2. Contractor shall schedule the sequence of commissioning process; from pre-functional submittals and review(s) through start-up, testing, and trouble-shooting activities.
  - 3. Contractor shall cooperate and assist the Owner's Commissioning Authority (CxA) in scheduling evaluation dates and meetings with the subcontractors and manufacturer technicians to complete the work in an expeditious and cohesive manner.



4. Prior to submission of close-out documents, Contractor shall review all CxA reports and findings and schedule subcontractors to make adjustments and calibrations to the satisfaction of the CxA and ensure a timely close-out process.

### **3.03 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 and product data.
- 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. Specifications: Legibly mark and record at each product section description of actual products installed, including manufacturer's name, product model and number, product substitutions or alternates utilized and any changes made by Addenda and modifications.
- F. Record Drawings: Legibly mark each item to record actual construction including:
  1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  3. Field changes of dimension and detail.
  4. Details not on original Contract drawings.

### **3.04 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. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### **3.05 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. Supplier and Installer contact information.
- 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. Additional information as specified in individual product Specification Sections.
- D. 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.

### **3.06 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. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
  - D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
  - E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
  - F. Provide servicing and lubrication schedule, and list of lubricants required.
  - G. Include manufacturer's printed operation and maintenance instructions.
  - H. Include sequence of operation by controls manufacturer.
  - I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
  - J. Provide control diagrams by controls manufacturer as installed.
  - K. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
  - L. Include test and balancing reports.
  - M. Additional Requirements: As specified in individual product specification sections.

### **3.07 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. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- D. Prepare data in the form of an instructional manual.
- E. 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.
- F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- H. 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.
- I. 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.
- J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages, house in plastic sleeves.

- L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  - 3. Part 3: Project documents and certificates, including the following:
    - a. Shop drawings and product data.
    - b. Air and water balance reports.
    - c. Certificates.
    - d. Commissioning Report(s).
    - e. Material Testing Reports.

### **3.08 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Provide spare parts, maintenance, and extra products in quantities as specified in individual Specification Sections. Deliver to the site and place in locations as directed by the Owner. Obtain receipts signed by Owner's Representative and submit copies to the Architect if so directed.

### **3.09 WARRANTIES AND BONDS**

- A. See Section 01 78 10: Warranties, for additional information.
- B. Retain warranties and bonds until time specified for submittal.
- C. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- D. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- E. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- F. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

### **3.10 CERTIFICATE OF NO ASBESTOS**

- A. See Section 01 30 00 - Administrative Requirements, for requirements for submission of Certificate(s) of No Asbestos.

### **3.11 FINAL TESTING REPORTS**

- A. See Section 01 40 00 - Quality Services, for requirements for the Testing Agency's Final Report.

**3.12 OPERATING AND MAINTENANCE INSTRUCTIONS / OWNER TRAINING**

- A. Instructions: The Contractor and his subcontractors and suppliers shall jointly, thoroughly instruct the Owner's representative and maintenance personnel in the proper maintenance and operation of all materials and systems that require training for proper operation and/or regular maintenance as follows:
1. Demonstrated and written detailed instructions shall be provided and reviewed for materials and systems listed in Substantial Completion Preliminary Procedures paragraph of this Section, shall include, but not be limited to:
    - a. Start-up and Shut-down procedures.
    - b. Emergency operations.
    - c. Noise and vibration adjustments.
    - d. Control sequences.
    - e. Trouble-shooting.
    - f. Safety procedures.
    - g. Maintenance manuals.
    - h. Maintenance agreements.
    - i. Warranties.
    - j. Record Drawings.
    - k. Tools, spare parts, lubricants.
    - l. Cleaning, economy and efficiency adjustments.
    - m. Identification systems.
    - n. Hazards. Any operations that, if improperly performed, might endanger the building's occupants or damage the building's equipment or contents.
  2. Video all demonstrations of operation and maintenance sessions, training sessions, and maintenance instructional sessions, which shall be held at the completed facility to instruct the Owner in the proper operation of equipment and systems. Prior to final payment, deliver two (2) copies to the Architect for forwarding to the Owner.
  3. The Contractor shall obtain sign-off from the Owner for meeting with each installer or manufacturer's representative. Meeting minutes shall be produced by the Contractor with a list of attendees, start and stop times, and any follow-up sessions required to complete the demonstrations, training, and instructions.
  4. For equipment or systems requiring seasonal operation, perform demonstrations for the other season within six (6) months.

**3.13 ADJUSTING**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation. For testing, adjusting and balancing of HVAC systems see Division 23 - Mechanical.

**3.14 FINAL CLEANING**

- A. Final Cleaning: Upon the completion of the Work, the Contractor shall remove all tools, scaffolding, surplus materials, debris, and shall leave the Work "broom clean" or its equivalent. In addition to general broom cleaning, the Contractor shall employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Use products that are non-hazardous. Cleaning shall be in compliance with requirements of Section 01 73 40 - Indoor Air Quality and with all manufacturer's written instructions. The following cleaning shall be done just before inspection for certification of Substantial Completion and final acceptance of the Work:
1. Transparent Materials: Clean mirrors and glazing in doors and windows; remove paint and glazing compounds that are noticeably vision obscuring; wash and polish, taking care not to scratch materials. Replace chipped, scratched, or broken materials.
  2. Ceiling and Wall Surfaces: Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, marks, fingerprints, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Carefully clean (vacuum)



fabric type surfaces as recommended by manufacturer. Generally clean as required to leave in first class condition.

3. Flooring: Remove all temporary protection; remove all spots, soil and paint; and clean, buff, etc. all ceramic tile, resilient flooring, base, and other floors in accordance with manufacturer's recommendations. Leave concrete floors broom clean. Vacuum carpeted surfaces.
4. Hardware: Clean and polish all hardware for all trades; this shall include removal of all paint stains, dust, dirt, etc.
5. All fixtures, equipment, doors, and door and window frames: Clean all surfaces per manufacturer's instructions, removing all stains, paint, dirt and dust.
6. Labels: Remove all labels that are not permanent.
7. Mechanical and Electrical Equipment: Wipe surfaces of equipment to be free of paint, dirt, and dust. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps. Replace burned-out lamps.
8. Roofs: Clean debris from roofs, scuppers, and drainage systems.
9. Site: Clean the building site and surrounding ground. All trash and rubbish shall be removed and properly disposed of off-site and in accordance with Section 01 74 19 Construction Waste Management. Sweep paved areas broom clean and remove stains and spills. Rake disturbed grounds that are neither paved nor planted, to a smooth even-textured surface.

**END OF SECTION**

**SECTION 01 78 10  
WARRANTIES****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Administrative and procedural requirements for warranties.

**1.02 RELATED SECTIONS**

- A. Section 01 00 00 - General Requirements.
- B. Section 01 78 00 - Project Close-out.
- C. Divisions 2 through 33 for specific Section requirements.

**1.03 GENERAL**

- A. Manufacturers' disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- B. "Standard Product Warranties" are preprinted written warranties published by individual manufacturers of particular products and are specifically endorsed by the manufacturer to the Owner.
- C. "Special Warranties" are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

**1.04 WARRANTY REQUIREMENTS**

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
  - 1. The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. Owner's Right of Refusal: The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- F. Commencement Date of Warranties: The Date of Substantial Completion designates the commencement date for warranties unless specifically indicated otherwise.
  - 1. Commencement of warranties for items not accepted shall not begin until after items have been accepted. The intent is that at the end of every phase, any items placed into

operation during that phase will have its warranty period start at substantial completion of that phase. Any items not accepted and listed as “work to be completed” will have its warranty begin when the work is accepted.

#### **1.05 SUBMITTALS**

- A. Submit written warranties and bonds to the Architect in conformance with Section 01 78 00 - Project Close-out.
- B. When a special warranty is required from the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Architect for review by the Owner prior to final execution.
- C. Form of Submittal: At Final Completion, compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer.
  - 1. Verify the documents are in proper form, contain full information, and are notarized. Co-execute warranties when required.

#### **1.06 SCHEDULE OF GUARANTEES, WARRANTIES, AND BONDS**

- A. Guarantee: The Contractor shall guarantee the entire Work to be free from defective or improper work or materials, and shall make good any damage due to such work or materials for a term of two (2) years from the date of the satisfactory completion and acceptance of the Work phases. In general the commencement date for warranties and guarantees shall be the date of Substantial Completion. Under no circumstances shall any warranties or guarantees for any individual or collective materials or items of equipment commence prior to the date of Substantial Completion. Extended guarantees or warranties, beyond the basic two (2) year term shall be provided as specified elsewhere.
- B. Provide guarantees, warranties, and bonds on products and installations as specified in individual Sections.

**END OF SECTION**

**SECTION 01 91 13**  
**GENERAL COMMISSIONING REQUIREMENTS**

**PART 1 - GENERAL****1.1 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.
- B. Owner's Project Requirements and Basis-of-Design documentation are included by reference for information only.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. General requirements for coordinating and scheduling commissioning.
  - 2. Commissioning meetings.
  - 3. Commissioning reports.
  - 4. Use of test equipment, instrumentation, and tools for commissioning.
  - 5. Construction checklists, including, but not limited to, installation checks, startup, performance tests, and performance test demonstration.
  - 6. Commissioning tests and commissioning test demonstration.
  - 7. Adjusting, verifying, and documenting identified systems and assemblies.

**1.3 DEFINITIONS**

- A. Acceptance Criteria: Threshold of acceptable work quality or performance specified for a commissioning activity, including, but not limited to, construction checklists, performance tests, performance test demonstrations, commissioning tests and commissioning test demonstrations.
- B. Basis-of-Design Document: A document prepared by Owner, Architect, or Commissioning Authority that records concepts, calculations, decisions, and product selections used to comply with Owner's Project Requirements and to suit applicable regulatory requirements, standards, and guidelines.
- C. Commissioning Authority / Agent (CxA): An entity engaged by Owner
- D. Commissioning Plan: A document, prepared by Commissioning Authority, that outlines the organization, schedule, allocation of resources, and documentation requirements of commissioning.
- E. Commissioning: A quality-focused process for verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, and tested to comply with Owner's Project Requirements.
- F. Construction Phase Commissioning Completion: The stage of completion and acceptance of commissioning when resolution of deficient conditions and issues discovered during commissioning and retesting until acceptable results are obtained has been accomplished. Owner will establish in writing the date Construction Phase Commissioning Completion is achieved.
  - 1. Commissioning is complete when the work specified in this Section and related Mechanical and Electrical Sections has been completed and accepted, including, but not limited to, the following:
    - a. Completion of tests and acceptance of test results.
    - b. Resolution of issues, as verified by retests performed and documented with acceptance of retest results.
    - c. Comply with requirements in Division 1 for "Demonstration and Training."
    - d. Completion and acceptance of submittals and reports.



- G. Owner's Project Requirements: A document written by Owner, Architect, or Commissioning Authority that details the functional requirements of a project and the expectations of how it will be used and operated, including Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
- H. Owner's Witness: Commissioning Authority (CxA) or Architect-designated witness authorized to authenticate test demonstration data and to sign completed test data forms.
- I. "Systems," "Assemblies," "Subsystems," "Equipment," and "Components": Where these terms are used together or separately, they shall mean "as-built" systems, assemblies, subsystems, equipment, and components.
- J. Test: Performance tests, performance test demonstrations, commissioning tests, and commissioning test demonstrations.
- K. Sampling Procedures and Tables for Inspection by Attributes: As defined in ASQ Z1.4.

#### **1.4 COMPENSATION**

- A. Should Architect, Commissioning Authority, other Owner's witness, or Owner's staff perform additional services or incur additional expenses due to actions of Contractor listed below, compensate Owner for such additional services and expenses.
  - 1. Failure to provide timely notice of commissioning activities schedule changes.
  - 2. Failure to meet acceptance criteria for test demonstrations.

#### **1.5 COMMISSIONING TEAM**

- A. Members Appointed by Contractor(s):
  - 1. Commissioning Coordinator: A person or entity employed by Contractor to manage, schedule, and coordinate commissioning. This person or entity shall have ten (10) years' experience in the commissioning of similar type buildings and systems.
  - 2. Project superintendent and other employees that Contractor may deem appropriate for a particular portion of the commissioning.
  - 3. Subcontractors, installers, suppliers, and specialists that Contractor may deem appropriate for a particular portion of the commissioning.
  - 4. Appointed team members shall have the authority to act on behalf of the entity they represent.
- B. Members Appointed by Owner:
  - 1. Commissioning authority, plus consultants that Commissioning Authority may deem appropriate for a particular portion of the commissioning.
  - 2. Owner facility operations and maintenance personnel, plus other consultants that Owner may deem appropriate for a particular portion of the commissioning.
  - 3. Architect, plus consultants that Architect may deem appropriate for a particular portion of the commissioning.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Comply with requirements in Section 01 30 00 Administrative Requirements for "Submittal Procedures" for submittal procedures general requirements for commissioning.
- B. Commissioning Plan Information:
  - 1. List of Contractor-appointed commissioning team members to include specific personnel and subcontractors to the performance of the various commissioning requirements.
  - 2. Schedule of commissioning activities, as defined by the Contractor, integrated with the construction schedule.
  - 3. Contractor personnel and subcontractors to participate in each test.

4. List of instrumentation required for each test to include identification of parties that will provide instrumentation for each test.
- C. Commissioning schedule.
- D. Two-week look-ahead schedules.
- E. List test instrumentation, equipment, and monitoring devices. Include the following information:
  1. Make, model, serial number, and application for each instrument, equipment, and monitoring device.
  2. Brief description of intended use.
  3. Calibration record showing the following:
    - a. Calibration agency, including name and contact information.
    - b. Last date of calibration.
    - c. Range of values for which calibration is valid.
    - d. Certification of accuracy.
    - e. N.I.S.T. traceability certification for calibration equipment.
    - f. Due date of the next calibration.
- F. Test Reports:
  1. Pre-Startup Report: Prior to start up of equipment or a system, submit signed, completed construction checklists.
  2. Test Data Reports: At the end of each day in which tests are conducted, submit test data for tests performed.
  3. Commissioning Issues Reports: Daily, at the end of each day in which tests are conducted, submit commissioning issue reports for tests for which acceptable results were not achieved.
  4. Weekly Progress Report: Weekly, at the end of each week in which tests are conducted, submit a progress report.
  5. Data Trend Logs: Submit data trend logs at the end of the trend log period.
  6. System Alarm Logs: Daily, at the start of days following a day in which tests were performed, submit print-out of log of alarms that occurred since the last log was printed.
- G. Construction Checklists:
  1. Material checks.
  2. Installation checks.
  3. Startup procedures, where required.

## **1.7 CLOSEOUT SUBMITTALS**

- A. Commissioning Report:
  1. At Construction Phase Commissioning Completion, include the following:
    - a. Pre-startup reports.
    - b. Approved test procedures
    - c. Test data forms, completed and signed.
    - d. Progress reports.
    - e. Commissioning issues report log.
    - f. Commissioning issues reports showing resolution of issues.
    - g. Correspondence or other documents related to resolution of issues.
    - h. Other reports required by commissioning.

- i. List unresolved issues and reasons they remain unresolved and should be exempted from the requirements for Construction Phase Commissioning Completion.
  - j. Report shall include commissioning work of Contractor.
- B. Request for Certificate of Construction Phase Commissioning Completion.
- C. Operation and Maintenance Data: For test equipment, instrumentation, and tools to include in operation and maintenance manuals.

## **1.8 QUALITY ASSURANCE**

- A. Commissioning Coordinator Qualifications:
  - 1. Documented experience commissioning systems of similar complexity to those contained in these documents on at three (3) projects of similar scope and complexity.
  - 2. Certification of commissioning process expertise. The following certifications are acceptable. Owner reserves the right to accept or reject certifications as evidence of qualification.

## **PART 2 - PRODUCTS**

### **2.1 TEST EQUIPMENT, INSTRUMENTATION, AND TOOLS**

- A. Test equipment and instrumentation required to perform the commissioning shall remain the property of Contractor unless otherwise indicated.
- B. Test equipment and instrumentation required to perform commissioning shall comply with the following criteria:
  - 1. Be manufactured for the purpose of testing and measuring tests for which they are being used and have an accuracy to test and measure system performance within the tolerances required to determine acceptable performance.
  - 2. Calibrated and certified.
    - a. Calibration performed and documented by a qualified calibration agency according to national standards applicable to the tools and instrumentation being calibrated. Calibration shall be current according to national standards or within test equipment and instrumentation manufacturer's recommended intervals, whichever is more frequent, but not less than within six months of initial use on Project. Calibration tags permanently affixed.
    - b. Repair and recalibrate test equipment and instrumentation if dismantled, dropped, or damaged since last calibrated.
  - 3. Maintain test equipment and instrumentation.
  - 4. Use test equipment and instrumentation only for testing or monitoring Work for which they are designed.

### **2.2 REPORT FORMAT AND ORGANIZATION**

- A. General Format and Organization:
  - 1. Bind report in three-ring binders.
  - 2. Label the front cover and spine of each binder with the report title, volume number, project name, Contractor's name, and date of report.
  - 3. Record report on compact disk.
  - 4. Electronic Data: Portable document format (PDF); a single file with outline-organized bookmarks for major and minor tabs and tab contents itemized for specific reports.
- B. Commissioning Report:
  - 1. Include a table of contents and an index to each test.

2. Include major tabs for each Specification Section.
3. Include minor tabs for each test.
4. Within each minor tab, include the following:
  - a. Test specification.
  - b. Pre-startup reports.
  - c. Approved test procedures.
  - d. Test data forms, completed and signed.
  - e. Commissioning issue reports, showing resolution of issues, and documentation related to resolution of issues pertaining to a single test. Group data forms, commissioning issue reports showing resolution of issues, and documentation related to resolution of issues for each test repetition together within the minor tab, in reverse chronological order (most recent on top).

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Review preliminary construction checklists and preliminary test procedures and data forms.

#### **3.2 CONSTRUCTION CHECKLISTS**

- A. Construction checklists cannot modify or conflict with the Contract Documents.
- B. Create construction checklists based on actual systems and equipment to be included in Project.
- C. Material Checks: Compare specified characteristics and approved submittals with materials as received. Include factory tests and other evaluations, adjustments, and tests performed prior to shipment, if applicable.
  1. Services connection requirements, including configuration, size, location, and other pertinent characteristics.
  2. Included optional features.
  3. Delivery Receipt Check: Inspect and record physical condition of materials and equipment on delivery to Project site, including agreement with approved submittals, cleanliness and lack of damage.
  4. Installation Checks:
    - a. Location according to Drawings and approved Shop Drawings.
    - b. Configuration.
    - c. Compliance with manufacturers' written installation instructions.
    - d. Attachment to structure.
    - e. Access clearance to allow for maintenance, service, repair, removal, and replacement without the need to disassemble or remove other equipment or building elements. Access coordinated with other building elements and equipment, including, but not limited to, ceiling and wall access panels, in a manner consistent with OSHA fall-protection regulations and safe work practices.
    - f. Utility connections are of the correct characteristics, as applicable.
    - g. Correct labeling and identification.
    - h. Startup Checks: Verify readiness of equipment to be energized. Include manufacturer's standard startup procedures and forms.
- D. Startup: Perform and document initial operation of equipment to prove that it is installed properly and operates as intended according to manufacturer's standard startup procedures, minimum.



- E. Performance Tests:
  - 1. Static Tests: As specified elsewhere, including, but not limited to, duct and pipe leakage tests, insulation-resistance tests, and water-penetration tests.
  - 2. Component Performance Tests: Tests evaluate the performance of an input or output of components under a full range of operating conditions.
  - 3. Equipment and Assembly Performance Tests: Test and evaluate performance of equipment and assemblies under a full range of operating conditions and loads.
  - 4. System Performance Tests: Test and evaluate performance of systems under a full range of operating conditions and loads.
  - 5. Intersystem Performance Tests: Test and evaluate the interface of different systems under a full range of operating conditions and loads.
- F. Deferred Construction Checklists: Obtain approval of proposed deferral of construction checklists, including proposed schedule of completion of each deferred construction checklist, before submitting request for Certificate of Construction Phase Commissioning Completion. When approved, deferred construction checklists may be completed after date of Construction Phase Commissioning Completion. Include the following in request for Certificate of Construction Phase Commissioning Completion:
  - 1. Identify deferred construction checklists by number and title.
  - 2. Provide a target schedule for completion of deferred construction checklists.
  - 3. Written approval of proposed deferred construction checklists, including approved schedule of completion of each deferred construction checklist.
- G. Delayed Construction Checklists: Obtain approval of proposed delayed construction checklists, including proposed schedule of completion of each delayed construction checklist, before submitting request for Certificate of Construction Phase Commissioning Completion. When approved, delayed construction checklists may be completed after date of Construction Phase Commissioning Completion. Include the following in request for Certificate of Construction Phase Commissioning Completion:
  - 1. Identify delayed construction checklist by construction checklist number and title.
  - 2. Provide a target schedule for completion of delayed construction checklists.
  - 3. Written approval of proposed delayed construction checklists, including approved schedule of completion of each delayed construction checklist.

### 3.3 GENERAL EXECUTION REQUIREMENTS

- A. Schedule and coordinate commissioning with the construction schedule.
- B. Perform activities identified in construction checklists, including tests, and document results of actions as construction proceeds.
- C. Perform test demonstrations for Owner's witness. Unless otherwise indicated, demonstrate tests for 100 percent of work to which the test applies. In some instances, demonstration of a random sample of other than 100 percent of the results of a test is specified.
  - 1. Where sampling is specified, the sampling plan and procedure for the test demonstration shall be determined using ASQ Z1.4.
  - 2. The "lot size" in ASQ Z1.4 is the sum of the number of items to which the test demonstration applies, as described in the scope subparagraph of each test.
  - 3. On determination of the sample size, the samples shall be selected randomly by Owner's witness at the time of the test demonstration.
  - 4. Include in the Commissioning Plan a detailed list of the test demonstrations with lot and sample quantities for each test.
- D. Report test data and commissioning issue resolutions.

- E. Schedule personnel to participate in and perform Commissioning-Process Work.
- F. Installing contractors' commissioning responsibilities include, but are not limited to, the following:
  - 1. Operating the equipment and systems they install during tests.
  - 2. In addition, installing contractors may be required to assist in tests of equipment and systems with which their work interfaces.

### **3.4 COMMISSIONING COORDINATOR RESPONSIBILITIES**

- A. Management and Coordination: Manage, schedule, and coordinate commissioning, including, but not limited to, the following:
  - 1. Coordinate with subcontractors on their commissioning responsibilities and activities.
  - 2. Obtain, assemble, and submit commissioning documentation.
  - 3. Attend and participate in periodic on-site commissioning meetings.
  - 4. Develop and maintain the commissioning schedule. Integrate commissioning schedule into the construction schedule. Update schedule at specified intervals.
  - 5. Review and comment on preliminary test procedures and data forms.
  - 6. Report inconsistencies and issues in system operations.
  - 7. Verify that tests have been completed and results comply with acceptance criteria, and that equipment and systems are ready before scheduling test demonstrations.
  - 8. Direct and coordinate test demonstrations.
  - 9. Coordinate witnessing of test demonstrations by Owner's witness.
  - 10. Coordinate and manage training. Be present during training sessions to direct video recording, present training and direct the training presentations of others.
  - 11. Prepare and submit specified commissioning reports.
  - 12. Track commissioning issues until resolution and retesting is successfully completed.
  - 13. Retain original records of Commissioning-Process Work, organized as required for the commissioning report. Provide Owner and Architect access to these records on request.
  - 14. Assemble and submit commissioning report.

### **3.5 COMMISSIONING TESTING**

- A. Quality Control: Construction checklists, including tests, are quality-control tools designed to improve the functional quality of Project. Test demonstrations evaluate the effectiveness of Contractor's quality-control process.
- B. Owner's witness will be present to witness commissioning work requiring the signature of an owner's witness, including, but not limited to, test demonstrations. Owner's Commissioning Authority will coordinate attendance by Owner's witness with Contractor's published commissioning schedule. Owner's witness will provide no labor or materials in the commissioning work. The only function of Owner's witness will be to observe and comment on the progress and results of commissioning.
- C. Construction Checklists:
  - 1. Complete construction checklists as Work is completed.
  - 2. Distribute construction checklists to installing contractors before they start work.
  - 3. Installers:
    - a. Verify installation using approved construction checklists as Work proceeds.
    - b. Complete and sign construction checklists on a regular basis for work performed during the preceding week.
  - 4. Provide Commissioning Authority access to construction checklists.

- D. Installation Compliance Issues: Record as an installation compliance issue Work found to be incomplete, inaccessible, at variance with the Contract Documents, nonfunctional, or that does not comply with construction checklists. Record installation compliance issues on the construction checklist at the time they are identified. Record corrective action and how future Work should be modified before signing off the construction checklist.
- E. Pre-Startup Audit: Prior to executing startup procedures, review completed installation checks to determine readiness for startup and operation. Report conditions, which, if left uncorrected, adversely impact the ability of systems or equipment to operate satisfactorily or to comply with acceptance criteria. Prepare pre-startup report for each system.
- F. Test Procedures and Test Data Forms:
  - 1. Test procedures shall define the step-by-step procedures to be used to execute tests and test demonstrations.
  - 2. Test procedures shall be specific to the make, model, and application of the equipment and systems being tested.
  - 3. Completed test data forms are the official records of the results of tests.
  - 4. Commissioning Authority will provide to Contractor preliminary test procedures and test data forms for performance tests and commissioning tests after approval of Product Data, Shop Drawings, and preliminary operation and maintenance manual.
  - 5. Review preliminary test procedures and test data forms and provide comments within 14 days of receipt from Commissioning Authority. Review shall address the following:
    - a. Equipment protection and warranty issues, including, but not limited to, manufacturers' installation and startup recommendations, and operation and maintenance instructions.
    - b. Applicability of the procedure to the specific software, equipment, and systems approved for installation.
  - 6. After Contractor has reviewed and commented on the preliminary test procedures and test data forms, Commissioning Authority will revise and reissue the approved revised test procedures and test data forms marked "Approved for Testing."
  - 7. Use only approved test procedures and test data forms marked "Approved for Testing" to perform and document tests and test demonstrations.
- G. Performance of Tests:
  - 1. The sampling rate for tests is 100 percent. The sampling rate for test demonstrations is 100 percent unless otherwise indicated.
  - 2. Perform and complete each step of the approved test procedures in the order listed.
  - 3. Record data observed during performance of tests on approved data forms at the time of test performance and when the results are observed.
  - 4. Record test results that are not within the range of acceptable results on commissioning issue report forms in addition to recording the results on approved test procedures and data forms according to the "Commissioning Compliance Issues" Paragraph in this Article.
  - 5. On completion of a test, sign the completed test procedure and data form. Tests for which test procedures and data forms are incomplete, not signed, or which indicate performance that does not comply with acceptance criteria will be rejected. Tests for which test procedures and data forms are rejected shall be repeated and results resubmitted.
- H. Performance of Test Demonstration:
  - 1. Perform test demonstrations on a sample of tests after test data submittals are approved.
  - 2. Notify Owner's witness at least three (3) days in advance of each test demonstration.

3. Perform and complete each step of the approved test procedures in the order listed.
  4. Record data observed during performance of test demonstrations on approved data forms at the time of demonstration and when the results are observed.
  5. Provide full access to Owner's witness to directly observe the performance of all aspects of system response during the test demonstration. On completion of a test demonstration, sign the completed data form and obtain signature of Owner's witness at the time of the test to authenticate the reported results.
  6. Test demonstration data forms not signed by Contractor and Owner's witness at the time of the completion of the procedure will be rejected. Test demonstrations for which data forms are rejected shall be repeated and results shall be resubmitted.
    - a. Exception for Failure of Owner's Witness to Attend: Failure of Owner's witness to be present for agreed-on schedule of test demonstration shall not delay Contractor. If Owner's witness fails to attend a scheduled test, Contractor shall proceed with the scheduled test. On completion, Contractor shall sign the data form for Contractor and for Owner's witness, and shall note the absence of Owner's witness at the scheduled time and place.
  7. False load test requirements are specified in related sections.
    - a. Where false load testing is specified, provide temporary equipment, power, controls, wiring, piping, valves, and other necessary equipment and connections required to apply the specified load to the system. False load system shall be capable of steady-state operation and modulation at the level of load specified. Equipment and systems permanently installed in this work shall not be used to create the false load without Architect's written approval.
- I. Deferred Tests:
1. Deferred Tests List: Identify, in the request for Certificate of Construction Phase Commissioning Completion, proposed deferred tests or other tests approved for deferral until specified seasonal or other conditions are available. When approved, deferred tests may be completed after the date of Construction Phase Commissioning Completion. Identify proposed deferred tests in the request for Certificate of Construction Phase Commissioning Completion as follows:
    - a. Identify deferred tests by number and title.
    - b. Provide a target schedule for completion of deferred tests.
  2. Schedule and coordinate deferred tests. Schedule deferred tests when specified conditions are available. Notify Architect and Commissioning Authority at least five (5) (minimum) days in advance of tests.
  3. Where deferred tests are specified, coordinate participation of necessary personnel and of Architect, Commissioning Authority, and Owner's witness. Schedule deferred tests to minimize occupant and facility impact. Obtain Architect's approval of the proposed schedule.
- J. Commissioning Compliance Issues:
1. Test results that are not within the range of acceptable results are commissioning compliance issues.
  2. Track and report commissioning compliance issues until resolution and retesting are successfully completed.
  3. If a test demonstration fails, determine the cause of failure. Direct timely resolution of issue and then repeat the demonstration. If a test demonstration must be repeated due to failure caused by Contractor work or materials, reimburse Owner for billed costs for the participation in the repeated demonstration.



4. Test Results: If a test demonstration fails to meet the acceptance criteria, perform the following:
  - a. Complete a commissioning compliance issue report form promptly on discovery of test results that do not comply with acceptance criteria.
  - b. Submit commissioning compliance issue report form within 48 hours of the test.
  - c. Determine the cause of the failure.
  - d. Establish responsibility for corrective action if the failure is due to conditions found to be Contractor's responsibility.
5. Commissioning Compliance Issue Report: Provide a commissioning compliance issue report for each issue. Do not report multiple issues on the same commissioning compliance issue report.
  - a. Exception: If an entire class of devices is determined to exhibit the identical issue, they may be reported on a single commissioning compliance issue report. (For example, if all return-air damper actuators that are specified to fail to the open position are found to fail to the closed position, they may be reported on a single commissioning issue report. If a single commissioning issue report is used for multiple commissioning compliance issues, each device shall be identified in the report, and the total number of devices at issue shall be identified.
  - b. Complete and submit Part 1 of the commissioning compliance issue report immediately when the condition is observed.
  - c. Record the commissioning compliance issue report number and describe the deficient condition on the data form.
  - d. Resolve commissioning compliance issues promptly. Complete and submit Part 2 of the commissioning compliance issue report when issues are resolved.
6. Diagnose and correct failed test demonstrations as follows:
  - a. Perform diagnostic tests and activities required to determine the fundamental cause of issues observed.
  - b. Record each step of the diagnostic procedure prior to performing the procedure. Update written procedure as changes become necessary.
  - c. Record the results of each step of the diagnostic procedure.
  - d. Record the conclusion of the diagnostic procedure on the fundamental cause of the issue.
  - e. Determine and record corrective measures.
  - f. Include diagnosis of fundamental cause of issues in commissioning compliance issue report.
7. Retest:
  - a. Schedule and repeat the complete test procedure for each test demonstration for which acceptable results are not achieved. Obtain signature of Owner's witness on retest data forms. Repeat test demonstration until acceptable results are achieved. Except for issues that are determined to result from design errors or omissions, or other conditions beyond Contractor's responsibility, compensate Owner for direct costs incurred as the result of repeated test demonstrations to achieve acceptable results.
  - b. For each repeated test demonstration, submit a new test data form, marked "Retest."
8. Do not correct commissioning compliance issues during test demonstrations.
  - a. Exceptions will be allowed if the cause of the issue is obvious and resolution can be completed in less than five (5) minutes. If corrections are made under this

exception, note the deficient conditions on the test data form and issue a commissioning compliance issue report. A new test data form, marked "Retest," shall be initiated after the resolution has been completed.

### **3.6 COMMISSIONING MEETINGS**

- A. Schedule commissioning meetings. Comply with requirements in Section 013100 "Project Management and Coordination."

### **3.7 SEQUENCING**

- A. Sequencing of Commissioning Verification Activities: For a particular material, item of equipment, assembly, or system, perform the following in the order listed unless otherwise indicated:

- 1. Construction Checklists:

- a. Material checks.
    - b. Installation checks.
    - c. Start up, as appropriate. Some startup may depend on component performance. Such startup may follow component performance tests on which the startup depends.
    - d. Performance Tests:
      - 1) Static tests, as appropriate.
      - 2) Component performance tests. Some component performance tests may depend on completion of startup. Such component performance tests may follow startup.
      - 3) Equipment and assembly performance tests.
      - 4) System performance tests.
      - 5) Intersystem performance tests.

- 2. Commissioning tests.

- B. Before performing commissioning tests, verify that materials, equipment, assemblies, and systems are delivered, installed, started, and adjusted to perform according to construction checklists.
- C. Verify readiness of materials, equipment, assemblies, and systems by performing tests prior to performing test demonstrations. Notify Architect if acceptable results cannot be achieved due to conditions beyond Contractor's control or responsibility.
- D. Commence tests as soon as installation checks for materials, equipment, assemblies, or systems are satisfactorily completed. Tests of a particular system may proceed prior to completion of other systems, provided the incomplete work does not interfere with successful execution of test.

### **3.8 SCHEDULING**

- A. Commence commissioning as early in the construction period as possible.
- B. Commissioning Schedule: Integrate commissioning into Contractor's construction schedule.
  - 1. Include detailed commissioning activities in monthly updated Contractor's construction schedule and short interval schedule submittals.
  - 2. Schedule the start date and duration for the following commissioning activities:
    - a. Submittals.
    - b. Preliminary operation and maintenance manual submittals.
    - c. Installation checks.
    - d. Startup, where required.

- e. Performance tests.
  - f. Performance test demonstrations.
  - g. Commissioning tests.
  - h. Commissioning test demonstrations.
- 3. Schedule shall include a line item for each installation check, startup, and test activity specific to the equipment or systems involved.
- 4. Determine milestones and prerequisites for commissioning. Show commissioning milestones, prerequisites, and dependencies in monthly updated critical-path-method construction schedule and short interval schedule submittals.
- C. Two-Week Look-Ahead Commissioning Schedule:
  - 1. Two weeks prior to the beginning of tests, submit a detailed two-week look-ahead schedule. Thereafter, submit updated two-week look-ahead schedules weekly for the duration of commissioning.
  - 2. Two-week look-ahead schedules shall identify the date, time, beginning location, Contractor personnel required, and anticipated duration for each startup or test activity.
  - 3. Use two-week look-ahead schedules to notify and coordinate participation of Owner's witnesses.
- D. Owner's Witness Coordination:
  - 1. Coordinate Owner's witness participation via Architect.
  - 2. Notify Architect of commissioning schedule changes at least five (5) work days in advance for activities requiring the participation of Owner's witness.

### 3.9 COMMISSIONING REPORTS

- A. Test Reports:
  - 1. Pre-startup reports include observations of the conditions of installation, organized into the following sections:
    - a. Equipment Model Verification: Compare contract requirements, approved submittals, and provided equipment. Note inconsistencies.
    - b. Preinstallation Physical Condition Checks: Observe physical condition of equipment prior to installation. Note conditions including, but not limited to, physical damage, corrosion, water damage, or other contamination or dirt.
    - c. Preinstallation Component Verification Checks: Verify components supplied with the equipment, preinstalled or field installed, are correctly installed and functional. Verify external components required for proper operation of equipment correctly installed and functional. Note missing, improperly configured, improperly installed, or nonfunctional components.
    - d. Summary of Installation Compliance Issues and Corrective Actions: Identify installation compliance issues and the corrective actions for each. Verify that issues noted have been corrected.
    - e. Evaluation of System Readiness for Startup: For each item of equipment for each system for which startup is anticipated, document in summary form acceptable to Owner completion of equipment model verification, preinstallation physical condition checks, preinstallation component verification checks, and completion of corrective actions for installation compliance issues.
  - 2. Test data reports include the following:
    - a. "As-tested" system configuration. Complete record of conditions under which the test was performed, including, but not limited to, the status of equipment, systems, and assemblies; temporary adjustments and settings; and ambient conditions.

- b. Data and observations, including, but not limited to, data trend logs, recorded during the tests.
  - c. Signatures of individuals performing and witnessing tests.
  - d. Data trend logs accumulated overnight from the previous day of testing.
3. Commissioning Compliance Issues Reports: Report as commissioning compliance issues results of tests and test demonstrations that do not comply with acceptance criteria. Report only one issue per commissioning compliance issue report. Use sequentially numbered facsimiles of commissioning compliance issue report form included in this Section, or other form approved by Owner. Distribute commissioning compliance issue reports to parties responsible for taking corrective action. Identify the following:
- a. Commissioning compliance issue report number. Assign unique, sequential numbers to individual commissioning compliance issue reports when they are created, to be used for tracking.
  - b. Action distribution list.
  - c. Report date.
  - d. Test number and description.
  - e. Equipment identification and location.
  - f. Briefly describe observations about the performance associated with failure to achieve acceptable results. Identify the cause of failure if apparent.
  - g. Diagnostic procedure or plan to determine the cause (include in initial submittal)
  - h. Diagnosis of fundamental cause of issues as specified below (include in resubmittal).
  - i. Fundamental cause of unacceptable performance as determined by diagnostic tests and activities.
  - j. When issues have been resolved, update and resubmit the commissioning issue report forms by completing Part 2. Identify resolution taken and the dates and initials of the persons making the entries.
  - k. Schedule for retesting.
4. Weekly progress reports include information for tests conducted since the preceding report and the following:
- a. Completed data forms.
  - b. Equipment or system tested, including test number, system or equipment tag number and location, and notation about the apparent acceptability of results.
  - c. Activities scheduled but not conducted per schedule.
  - d. Commissioning compliance issue report log.
  - e. Schedule changes for remaining Commissioning-Process Work, if any.
5. Data trend logs shall be initiated and running prior to the time scheduled for the test demonstration.
- a. Trend log data format shall be multiple data series graphs. Where multiple data series are trend logged concurrently, present the data on a common horizontal time axis. Individual data series may be presented on a segmented vertical axis to avoid interference of one data series with another, and to accommodate different axis scale values. Graphs shall be sufficiently clear to interpret data within the accuracy required by the acceptance criteria.
  - b. Attach to the data form printed trend log data collected during the test or test demonstration.



- c. Record, print out, and attach to the data form operator activity during the time the trend log is running. During the time the trend log is running, operator intervention not directed by the test procedure invalidates the test results.
- 6. System Alarm Logs: Record and print out a log of alarms that occurred since the last log was printed. Evaluate alarms to determine if the previous day's work resulted in any conditions that are not considered "normal operation."
  - a. Conditions that are not considered "normal operation" shall be reported on a commissioning issue report attached to the alarm log. Resolve as necessary. The intent of this requirement is to discover control system points or sequences left in manual or disabled conditions, equipment left disconnected, set points left with abnormal values, or similar conditions that may have resulted from failure to fully restore systems to normal, automatic control after test completion.

### **3.10 CERTIFICATE OF CONSTRUCTION PHASE COMMISSIONING COMPLETION**

- A. When Contractor considers that construction phase commissioning, or a portion thereof which Owner agrees to accept separately, is complete, Contractor shall prepare and submit to Owner and Commissioning Authority through Architect a comprehensive list of items to be completed or corrected. Failure to include an item on such list does not alter Contractor's responsibility to complete commissioning.
- B. On receipt of Contractor's list, Commissioning Authority will make an inspection to determine whether the construction phase commissioning or designated portion thereof is complete. If Commissioning Authority's inspection discloses items, whether included on Contractor's list, which is not sufficiently complete as defined in "Construction Phase Commissioning Completion" Paragraph in the "Definitions" Article, Contractor shall, before issuance of the Certificate of Construction Phase Completion, complete or correct such items on notification by Commissioning Authority. In such case, Contractor shall then submit a request for another inspection by Commissioning Authority to determine construction phase commissioning completion.
- C. Contractor shall promptly correct deficient conditions and issues discovered during commissioning. Costs of correcting such deficient conditions and issues, including additional testing and inspections, the cost of uncovering and replacement, and compensation for Architect's and Commissioning Authority's services and expenses made necessary thereby, shall be at Contractor's expense.
- D. When construction phase commissioning or designated portion is complete, Commissioning Authority will prepare a Certificate of Construction Phase Commissioning that shall establish the date of completion of construction phase commissioning. Certificate of Construction Phase Commissioning Completion shall be submitted prior to requesting inspection for determining date of Substantial Completion.

### **END OF SECTION**

**SECTION 02 32 10**  
**SUBSURFACE EXPLORATIONS**

**PART 1 - GENERAL****1.01 GEOTECHNICAL REPORT AND SAMPLES**

- A. On January 20, 2017, January 23, 2017 and January 25, 2017 soils investigations (test borings) were conducted and a report prepared for the Owner by Summit Geoengineering Services. of Rockland, Maine. This report, titled "Mid-Coast School of Technology, 1 Main Street, Rockland, Maine", dated February 10, 2017, was provided for the use of the Architect in the design of the Project. Part of the information contained in this report is interpretive (not factual) and therefore Bidders shall make their own deductions of subsurface conditions which may affect methods or cost of construction. This report has been attached at the end of this Specification for convenience.

**1.02 SUBSURFACE CONDITIONS**

- A. The Owner has explored subsurface conditions and authorized soil investigations on site.
- B. Factual boring logs and laboratory test results, are part of the geotechnical report. The logs describe subsurface conditions encountered at the exploration locations at the time explorations were made. Actual subsurface conditions may vary between exploration locations. No warranties, expressed or implied, are made as to accuracy of subsurface information provided herein.
- C. No warranty is made of the continuity of strata or material between the exploration locations. The stratification lines on the logs represent approximate boundaries between soil types. The actual transitions between soil types may be gradual.
- D. Water level readings have been observed in the explorations at times and under conditions stated on the logs. It must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors not evident at the time of drilling when the measurements were made
- E. Boring locations shown on the drawings are approximate only and the Owner and Architect, including their consultants, make no representations regarding correctness of such information.
- F. Bidders shall make their own deductions of subsurface conditions which may affect methods or cost of construction. Bidders may, at their own expense, and upon application to the Owner, conduct additional subsurface testing.

**1.03 USE OF DATA**

- A. The subsurface investigations were obtained by the Owner only for the Architect's use in design, and are not a part of the Construction Documents. It is understood that neither the Owner, Architect, nor their consultants shall be responsible for any interpretations or conclusions drawn there from by Bidders or the Contractor with regard to the interpretive data or geotechnical report. The Owner and Architect, including their consultants, claim no responsibility for or endorsement of any construction methods, means, or techniques which may be contained in or implied by the above referenced logs and report.
- B. Bidders shall visit the site and familiarize themselves with all existing conditions. Prior to bidding, Bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but all such investigations shall be performed under time schedule and arrangements approved in advance by the Owner.
- C. The Owner and Architect, including their consultants, cannot guarantee the continuity of subsurface conditions between test locations. The Owner and Architect, including their consultants, cannot guarantee the accuracy or completeness of related documents and reports.

- D. The Contractor must interpret the subsurface data relying upon his own judgement and acknowledges that the Owner and Architect, including their consultants, shall not be responsible for any deduction, interpretation, or conclusion made by any Bidder or Contractor.
- F. No claim for extra cost or extension of time resulting from the Bidder or Contractor's deductions, interpretations, or conclusions shall be allowed.

**END OF SECTION**

**SECTION 02 41 00  
DEMOLITION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Building demolition excluding removal of hazardous materials and toxic substances.
  - 1. Provide complete demolition and removal of the existing building, including all walls, partitions, roofing, building finishes and contents that remain after the Owner has removed items to be retained by the Owner.
    - a. Partial demolition of foundations and slabs-on-grade as indicated per this Section.
- B. Abandonment in place of existing utilities and utility structures.
- C. The Work of this Section is not necessarily fully represented on the Drawings or specifically identified herein. The Contractor, either himself or through his various subcontractors, shall thoroughly review all available documents and shall visit the site and existing building prior to bidding, as required to fully satisfy himself as to the types, locations and quantities of demolition work required for the complete and proper execution of the Work. No pleas of misunderstanding resulting from the failure to adequately inspect existing conditions will be entertained and no additional expenses related thereto will be granted.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 50 00 - Temporary Facilities: Site fences, security, protective barriers, and waste removal.
- B. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- C. Section 01 74 19 - Construction Waste Management: Limitations on disposal of removed materials; requirements for recycling.
- D. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
  - 1. Areas for temporary construction and field offices.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
  - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
  - 2. Identify demolition firm and submit qualifications.
  - 3. Include a summary of safety procedures.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

**1.05 QUALITY ASSURANCE**

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
  - 1. Minimum of 10 years of documented experience.



**PART 2 PRODUCTS****2.01 MATERIALS**

- A. Fill Material: As specified in Section 31 23 23 - Fill.

**PART 3 EXECUTION****3.01 SCOPE**

- A. Remove the entire building at 1 Main Street, Rockland Maine. The existing structure to be removed is approximately 57,000 square feet of structure and includes the demolition and removal of miscellaneous associated outbuildings, sheds and other structures and items located on the property. This includes underground and above ground tanks, vaults, other items.
- B. Remove all other paving and curbs within site boundaries.
- C. Outside area of new building construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
- D. Remove all foundation walls, footings and concrete slabs located within the proposed new building boundary. Such boundary shall include the building footprint proper plus an imaginary bound set 5'-0" beyond such footprint.
- E. Break up concrete slabs on grade remaining within site boundaries, and more than 2 feet below finish grade, to permit natural moisture drainage; leave pieces not larger than 1 square yard.
- F. Remove other items indicated, for salvage, relocation, and recycling.
  - 1. Existing Aluminum Flagpole and accessories.
  - 2. Existing School Sign located along Main Street shall remain and be protected.
  - 2. Other items indicated on the Drawings or indicated in these specifications.
- G. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

**3.02 SPECIAL REQUIREMENTS FOR DEMOLITION**

- A. All methods, techniques and procedures of safety, shoring, barricading, fencing, protection, demolition, removal and disposal are left solely to the discretion of, and shall be the responsibility of the Contractor. Special attention shall be paid to the issues of safety and protection of existing construction and/or landscaping and site improvements to remain. The Contractor shall take all precautions necessary to prevent the movement, settlement, or failure of adjacent construction. See Section 01 00 00 - General Requirements, for additional information.
- B. Per EPA regulations, beginning April 2010, contractors performing renovation, repair, and painting in residential, childcare and school projects that disturb lead paint (assumed to be any building construction prior to 1978) shall be certified and shall follow specific work practices that include notification of occupants and sealing off the work area. The rule does not apply to minor maintenance or repair activities where less than six square feet of lead-based paint is disturbed in a room or where less than 20 square feet of lead-based paint is disturbed on the exterior.
- C. The Contractor shall be responsible for compliance with all applicable Local, State and Federal environmental regulations, including but not limited to the National Emission Standard for Hazardous Air Pollutants, as enforced by the United States Environmental Protection Agency. It shall be the Contractor's responsibility to provide all inspections and notifications related thereto.

**3.03 GENERAL PROCEDURES AND PROJECT CONDITIONS**

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain and pay for all required permits and approvals required for demolition, hauling, dumping and in general, all activities related to the Work of this Section.
  2. Comply with applicable requirements of NFPA 241.
- B. The Contractor shall be alert to potential problems or dangerous conditions. He shall exercise caution during demolition or removal which may affect structural safety. He shall proceed only when he has fully satisfied himself that he has provided proper support, shoring, bracing, protection, and safety precautions.
1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved
  2. 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.
  3. Provide, erect, and maintain temporary barriers and security devices.
  4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  5. Do not close or obstruct roadways or sidewalks without permit.
  6. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from Owner.
- D. 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.
- E. The Architect's Scope of Services and responsibilities exclude the investigation, discovery, detection, identification, presence, leakage, release, use, handling, disposal, encapsulation, abatement, treatment or removal of, or exposure of a person or persons to, hazardous materials, pollutants, contaminants, or disease transmitting organisms, pre existing or otherwise deposited at any time and in any form at the Project, including but not limited to volatile organic compounds, molds, fungus, bacteria, petroleum products, lead, asbestos or asbestos products, radon and electro-magnetic frequency radiation or other radiation. Should any such substances be encountered, the Owner and Architect shall be promptly notified, in writing.
- F. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Comply with requirements of Section 01 74 19 - Waste Management.

### **3.04 EXISTING UTILITIES**

- A. The termination, demolition, and removal of utilities shall comply with the procedures, regulations, and recommendations of related utilities and governing authorities. The Contractor shall contact such agencies prior to proceeding, in order to assess their requirements and ensure proper coordination and full compliance.
- B. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- C. Protect existing utilities to remain from damage.
- D. Do not disrupt public utilities without permit from authority having jurisdiction.
- E. 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.
- F. Unused underground piping may be abandoned in place, provided it is completely drained and capped, and is 2 feet below finish grade; remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
1. All underground utilities located within the proposed new building boundary shall be completely removed. Such boundary shall include the building footprint proper plus an imaginary bound set 5'-0" beyond such footprint.

- G. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

**3.05 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Remove any residual oil and or propane from tanks.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
- C. Contractor shall leave the site in neat, clean and safe condition, with all appropriate barricades, fencing, warning signage, etc. securely in place, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

**SECTION 02 41 13  
SELECTIVE SITE DEMOLITION**

**PART 1 - GENERAL**

**1.1 SECTIONS INCLUDES**

- A. Methods and procedures for demolishing, salvaging, recycling and removing sitework items designated to be removed in whole or in part, and for backfilling resulting trenches and excavations.

**1.2 RELATED SECTIONS**

- A. Section 01 35 43 - Environmental Procedures
- B. Section 31 10 00 - Site Clearing
- C. Section 31 23 16 - Excavation

**1.3 SUBMITTALS**

- A. Shop drawings
  - 1. Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.
  - 2. Submit drawings stamped and signed by qualified professional engineer licensed in Province of Newfoundland and Labrador, Canada.
- B. Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- C. Submit plan indicating:
  - 1. Descriptions of and anticipated quantities of materials to be salvaged, reused, recycled and landfilled.
  - 2. Schedule of selective demolition.
  - 3. Number and location of dumpsters.
  - 4. Anticipated frequency of tippage.
- D. Submit copies of certified weigh bills, bills of landing from authorized disposal sites and reuse and recycling facilities for material removed upon request from Owner's Representative.

**1.4 QUALITY ASSURANCE**

- A. Convene pre-installation meeting one week prior to beginning work of this section to:
  - 1. Verify project requirements.
  - 2. Review installation and substrate conditions.
  - 3. Co-ordination with building subtrades.
- B. Arrange for site visit with Owner's Representative to examine existing site conditions adjacent to demolition work, prior to start of Work.
- C. Hold project meetings every month.
  - 1. Ensure key personnel, site supervisor, project manager, subcontractor representatives attend.

**1.5 DELIVERY, STORAGE AND HANDLING**

- A. Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Owner's Representative and at no cost to Owner's Representative.

- B. Remove and store materials to be salvaged in a manner to prevent damage.
- C. Store and protect in accordance with requirements for maximum preservation of material.

## **1.6 SITE CONDITIONS**

- A. In all circumstances ensure that demolition work does not adversely affect adjacent water courses groundwater and wildlife, or contribute to excess air and noise pollution.
- B. Do not dispose, of waste or volatile materials such as mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
- C. Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- D. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- E. Protect trees, plants and foliage on adjacent properties and onsite where indicated and.

## **1.7 EXISTING CONDITIONS**

- A. Prior to start of any demolition work remove contaminated or hazardous materials as defined by authorities having jurisdiction from site and dispose of at designated disposal facilities

## **1.8 SCHEDULING**

- A. Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
- B. Notify Owner's Representative in writing when unforeseen delays occur.

## **PART 2 - PRODUCTS (NOT APPLICABLE)**

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Inspect site with Owner's Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- B. Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- C. Notify and obtain approval of utility companies before starting demolition.

### **3.2 REMOVAL OF HAZARDOUS WASTES**

- A. Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

### **3.3 REMOVAL OPERATIONS**

- A. Remove items as indicated.
- B. Do not disturb items designated to remain in place.
- C. Removal of Pavements, Curbs and Gutters
  - 1. Square up adjacent surfaces to remain in place by saw cutting or other method approved by Owner's Representative.



2. Protect adjacent joints and load transfer devices.
3. Protect underlying and adjacent granular material.
- D. When removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving, prevent contamination with base course aggregates.
- E. When removing pipes under existing or future pavement area, excavate at least one (1) foot below pipe invert.
- F. Decommission water wells and monitoring wells in accordance with municipal guidelines and local regulations.
- G. Removal from site
  1. Interim removal of stockpiled material will be required by Owner's Representative, if it is deemed to interfere with operations of Owner's Representative, Owner or other contractors.
- H. Sealing
  1. Seal pipe ends and walls of manholes or catch basins as indicated. Securely plug to form watertight seal.
- I. Backfill
  1. Backfill in areas as indicated.

### **3.4 RESTORATION**

- A. Restore areas and existing works outside areas of demolition to match conditions of adjacent, undisturbed areas.
- B. Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or groundwater.

### **3.5 CLEAN UP**

- A. Upon completion of work, remove debris, trim surfaces and leave work site clean.
- B. Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or groundwater.

**END OF SECTION 02 41 13**

**SECTION 02 65 00**  
**UNDERGROUND STORAGE TANK REMOVAL**

**PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Removing and disposal of underground storage tank (UST) liquid contents.
  - 2. Removing, cleaning, and disposing UST.
  - 3. Testing and removing contaminated soils.
  - 4. Backfilling and restoring excavation areas.

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Differing Site Conditions: Extent of excavation and restoration for UST removal indicated on drawings and extent of additional soils sampling and testing specified in this section are estimated. Variations less than five (5) percent change are not cause for contract price and time adjustments. Additional work will be paid by unit prices as directed by Contracting Officer's Representative (COR).

**1.3 APPLICABLE PUBLICATIONS**

- A. Comply with references to extent specified in this section.
- B. American Petroleum Institute (API):
  - 1. 1604-96(R2010) - Closure of Underground Petroleum Storage Tanks.
  - 2. 2217A-09 - Safe Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries.
  - 3. 2015-14 - Safe Entry and Cleaning of Petroleum Storage Tanks.
- C. Code of Federal Regulations (CFR):
  - 1. 40 CFR Part 280 - Underground Storage Tanks; Technical Requirements.
  - 2. 49 CFR Part 178 - Specifications for Packagings.
- D. United States Environmental Protection Agency (EPA):
  - 1. SW-846 - Evaluating Solid Waste: Physical/Chemical Methods.

**1.4 PRE-REMOVAL MEETINGS**

- A. Conduct pre-removal meeting at project site minimum 30 days before beginning Work of this section.
  - 1. Required Participants:
    - a. Contracting Officer's Representative.
    - b. Architect/Engineer
    - c. Inspection and Testing Agency
    - d. Contractor
    - e. UST removal contractor
  - 2. Meeting Agenda: Distribute agenda to participants minimum three (3) days before meeting.

- a. Removal schedule.
  - b. Removal sequence.
  - c. Preparatory work.
  - d. Contaminated material containment and disposal.
  - e. Removal.
  - f. Inspecting and testing.
  - g. Other items affecting successful completion.
3. Document and distribute meeting minutes to participants to record decisions affecting installation.

## **1.5 SUBMITTALS**

- A. Test Reports: Submit testing laboratory reports.
  1. UST liquid contents analysis.
  2. UST interior environment analysis.
  3. Soil sample analysis.
- B. Qualifications: Substantiate qualifications comply with specifications.
  1. UST removal contractor.
  2. Testing laboratory.
  3. Liquid disposal facility.
  4. UST disposal facility.
  5. Soils disposal facility.
- C. UST removal plan.
- D. Record Documents:
  1. Six (6) copies of Final Closure Report.
  2. Record Drawings in electronic CAD file format showing:
    - a. Soil sample locations.
    - b. Detailed plan view.
    - c. Piping removal diagrams.
    - d. Control removal diagrams.
    - e. Component diagrams including tank removal procedure.
    - f. Detailed sequence of procedure.
  3. Photographs of work in progress showing UST removal plan compliance.
  4. Chain-of-custody documentation.
  5. Disposal facility receipts and disposition reports.

## **1.6 QUALITY ASSURANCE**

- A. UST Removal Contactor: Experienced contractor, registered or licensed by applicable state agency regulating UST removal.
- B. Testing Laboratory: State certified independent testing laboratory experienced in hazardous waste liquid and soil testing.
- C. Liquid Disposal Facility: State certified disposal facility qualified to receive and dispose UST liquid contents.

- D. UST Disposal Facility: State certified disposal facility qualified to receive and dispose UST.
- E. Soils Disposal Facility: State certified disposal facility qualified to receive and dispose contaminated soils.
- F. UST Removal Plan: Describe detailed procedures for:
  - 1. Removing and disposing UST liquid content.
  - 2. Removing, ventilating, cleaning and disposing UST.
  - 3. Soil sampling and testing.
  - 4. Removing and disposing contaminated soils.
- G. UST Final Closure Report: Assemble work progress documentation showing removal plan compliance, including:
  - 1. Sample test records.
  - 2. Local Fire Marshal requirement.
  - 3. State Agency requirements.
  - 4. Hazardous material plan for local VA management.

## **1.7 FIELD CONDITIONS**

- A. Do not close or obstruct streets, sidewalks or drives without Contracting Officer's Representative's approval.
  - 1. Submit closure request minimum 30 days before starting work.

## **PART 2 - PRODUCTS**

### **2.1 ACCESSORIES**

- A. Waste Collection Drums: 49 CFR Part 178; Type 1A2, steel, removable head, 55 gal. capacity, capable of containing waste without loss.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Coordinate demolition required to access UST site.

### **3.2 UST SEQUENCE**

- A. Notify applicable State Agency minimum 30 days before UST closure.
- B. Determine if contamination from UST is present.
- C. When contamination exists, notify Contracting Officer's Representative and cooperate to record site with applicable State Agency and EPA.
- D. Remove UST liquid contents, UST, and associated facilities.

- E. Remove contaminated soil.
- F. Backfill excavated area.
- G. Restore disturbed surfaces.

### **3.3 UST CLOSURE**

- A. Conform to API 1604, 40 CFR Part 280, 29 CFR Part 1910, and 29 CFR Part 1926.

### **3.4 UST LIQUID CONTENTS REMOVAL**

- A. Collect, test, and analyze UST liquid content samples.
  - 1. Identify individual constituents and concentrations.
  - 2. Identify lower explosive limits for constituents in gaseous form.
  - 3. Identify disposal facilities qualified to receive and process UST liquid contents.
- B. Remove UST liquid contents before removing UST.
  - 1. Record liquid volume removed from UST.
- C. Deliver UST liquid contents to disposal facility.
  - 1. Obtain signed receipt including date, time, total liquid volume, and description of materials received.
  - 2. Obtain final report of UST liquid contents disposition after disposal completion.

### **3.5 UST REMOVAL**

- A. Excavate overburden and soils immediately surrounding UST.
  - 1. Contain excavated materials to prevent loss and mixing with other materials until completion of initial soils testing.
- B. Remove UST from excavation.
- C. Place UST on ground adjacent to removal location.
- D. Secure UST before cleaning.

### **3.6 UST CLEANING**

- A. Measure combustible gas and oxygen concentrations within UST.
- B. Ventilate UST interior to reduce combustible gas concentrations to maximum 10 percent of lower explosive limit and to provide 19.5 to 23.5 percent oxygen concentration.
  - 1. Test UST interior atmosphere confirming gas concentrations.
  - 2. Complete required ventilation before cleaning.
- C. Cut ports in UST wall facilitating cleaning access. Comply with API Standard 2217A and API Standard 2015 for UST entry.
- D. Clean surface contaminants from UST and access port interior wall surfaces.



1. Contain removed materials without producing further contamination.
  2. Collect removed materials in waste collection drums. Seal drums to prevent material loss.
- E. Request UST inspection by local Fire Marshal and State Agency certifying completed UST cleaning.
- F. Dismantle UST as required for transport to disposal facility.
- G. Deliver UST, removed access ports, and waste collection drums to disposal facility.
1. Obtain signed receipt including date, time, quantity, and description of materials received.
  2. Obtain final report of materials disposition after disposal completion.

### **3.7 SOIL TESTING**

- A. Collect a minimum of five (5) soil samples from UST excavation area after tank removal.
- B. Take one (1) sample from both UST sidewalls, one (1) sample from both UST endwalls, and one (1) sample from UST base.
1. Containerize samples to prevent sample loss and preserve sample condition until tested.
  2. Test and analyze samples according to EPA SW-846 for total petroleum hydrocarbon (TPH) concentrations.
- C. When soil testing reveals evidence of hydrocarbons at concentrations greater than permitted by applicable State Agency for uncontaminated soil used as fill material, collect six (6) additional soil samples 20 feet from UST walls.
1. Take two (2) samples from both UST sidewalls and one (1) sample from both UST endwalls.
  2. Test and analyze samples as specified for initial samples.
  3. Notify Contracting Officer's Representative when additional samples are contaminated.
  4. The base price for volume between the final tank volume of material for the enclosure and the enclosure shall not to exceed 100 cubic yards of soil removed. Any work beyond 100 cubic yards and more than six (6) test locations shall be considered extra and shall be based on unit pricing.
- D. Perform additional soil sampling and testing around UST as directed by Contracting Officer's Representative until contaminate concentration is less than permitted by applicable State Agency for uncontaminated soil used as fill material.

### **3.8 CONTAMINATED SOIL REMOVAL**

- A. Excavate and remove contaminated soil from site according to applicable State Agency requirements.
- B. Deliver contaminated soils to disposal facility.
1. Obtain signed receipt including date, time, quantity, and description of materials received.
  2. Obtain final report of materials disposition after disposal completion.

### **3.9 UST EXCAVATION BACKFILL AND RESTORATION**

- A. Backfill excavation with fill materials and compact.

- B. Restore pavements, sidewalks, and curbs matching adjacent materials.
- C. Restore landscaped areas and grass areas to match adjacent materials.

**3.10 FIELD QUALITY CONTROL**

- A. Field Tests: Performed by testing laboratory approved by COR.
- B. Perform sampling and testing for the following:
  - 1. UST liquid contents.
  - 2. UST interior environment.
  - 3. Soils contamination.
- C. Record chain-of-custody for samples until disposal.

**3.11 PROTECTION**

- A. Protect restored areas from traffic and construction operations.
- B. Repair all damages incurred from work.

**END OF SECTION 02 65 00**

**SECTION 03 30 00**  
**CAST -IN-PLACE CONCRETE****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

**1.02 DESCRIPTION OF WORK**

- A. Work included: Provide labor, materials, and equipment necessary to complete the work of this Section and, without limiting the generality thereof, furnish and include the following:
  - 1. The extent of cast-in-place concrete work is shown on drawings and includes (but not by way of limitation) formwork, reinforcing, cast-in-place concrete, accessories, finishing, and casting in of items specified under other Sections of the Specifications or furnished by Owner that are required to be built-in with the concrete.
  - 2. Equipment support pads indicated on mechanical drawings to be installed by the Building Contractor.
  - 3. Cast-in-place retaining walls, exterior slabs on grade and other concrete shown on site drawings.

**1.03 RELATED WORK**

- A. Metal Fabrications: Section 05 50 00
  - 1. Expansion Anchors - Section 05 12 00
  - 2. Embedded Items - Section 05 50 00
- B. Anchor Bolts: Section 05 12 00
- C. Joint Sealants: Section 07 90 00
- D. Radiant heat: Section 07 21 00
- E. Underslab Vapor Retarders/Wall Waterproofing: Division 7

**1.04 QUALITY ASSURANCE**

- A. Codes and Standards: Comply with provisions of the latest edition of the following except where more stringent requirements are shown or specified:
  - 1. ACI "Manual of Concrete Practice".
  - 2. ACI 117 "Standard Specifications for Tolerances for Concrete Construction and Materials".
  - 3. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete."
  - 4. ACI 212.3R "Chemical Admixtures for Concrete."
  - 5. ACI 301 "Specifications for Structural Concrete for Buildings."
  - 6. ACI 302.1R "Guide for Concrete Floor and Slab Construction."

7. ACI 304R "Guide for Measuring, Mixing, Transporting and Placing Concrete."
8. ACI 304.2R "Placing Concrete by Pumping Methods."
9. ACI 306 R "Cold Weather Concreting."
10. ACI 308 "Standard Practice for Curing Concrete."
11. ACI 309R "Guide for Consolidation of Concrete."
12. ACI 315 "ACI Detailing Manual."
13. ACI 318 "Building Code Requirements for Reinforced Concrete."
14. ACI 347R "Guide to Formwork for Concrete."
15. Concrete Reinforcing Steel Institute, "Placing Reinforcing Bars."
16. AISC "Code of Standard Practice for Steel Buildings and Bridges."
17. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).

- B. Materials and installed work may require testing and retesting, as directed by the Architect, at any time during progress of work. Allow free access to material stockpiles and facilities. Tests not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

## 1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Division 1.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.
- H. Electronic Submittals:
1. Contractor shall include in the submittal schedule an indication of submittals that are intended to be submitted electronically. Upon receipt of the submittal schedule, the Engineer reserves the right to indicate submittals that will not be accepted electronically. Paper copies of such submittals shall be furnished as referenced in this specification.
  2. The Engineer reserves the right to require paper copies of submittals that are received electronically. Provide Engineer one (1) paper copies in addition to the electronic submittal. Paper copy will be retained and electronic copy will be returned. Review cycle for such submittals shall not commence until such time that the paper copies are received.
  3. Electronic Submittals shall be submitted in Protected Document Format (PDF) compatible with Bluebeam version 12 or later. Electronic files shall not be broken into smaller individual files. File sizes too large to process email or within a file transfer protocol (FTP) site shall be provided on a CD.

4. The submission of submittals electronically does not relieve the contractor of their responsibility to review the submittal prior to transmission to the Engineer. Electronic Submittals shall include contractor comments, and a statement and/or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with. Electronic submittals without the Contractor's approval will be rejected and returned.
  5. The Engineer assumes no responsibility for the printed reproduction of submittals reviewed electronically, transmission errors or returned electronic submittals that become corrupted or are otherwise not accessible by the Contractor's or Subcontractor's computer hardware and/or software.
- I. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
1. Reinforcement certified mill reports covering chemical and physical properties and yield strength.
  2. Patching products.
  3. Non-shrink grout.
  4. Curing compounds, where applicable.
  5. Admixtures.
  6. Expansion/Adhesive Anchors.
- J. Shop Drawings:
1. Shop Drawing Preparation: Electronic files of structural drawings will not be provided to the contractor for preparation of shop drawings. Reproduction of any portion of the Construction Documents for use as Shop drawings is prohibited. Shop drawings created from reproduced Construction Documents will be returned without review. Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315, showing bar schedules, stirrup and tie spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required at openings through concrete elements. Include supplemental reinforcing and bar supports necessary to support reinforcing steel at proper location within forms or slabs.
    - a. Review of the shop drawings will be made for the size and arrangement of reinforcement. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility.
    - b. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided all items listed prior. **Incomplete submittals will not be reviewed.**
- K. Mix designs: Submit all laboratory test reports and materials for each mix design listed within. Prepare mixes by the field experience method and/or trial mixtures per the requirements of chapter 5 of ACI 318. Include the calculation of average strength and standard deviation. Proportioning by water cement ratio method will not be permitted.
- L. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.
- M. Curing Methods: Submit documentation of curing methods to be used for review. Account for anticipated project temperature ranges and conditions in curing methods.
- N. Contraction/Construction Joints: Submit plan indicating proposed location of contraction and construction joints in walls and slabs.



- O. Test Reports: Test reports shall be submitted to the Owner, Architect and Engineer within 48 hour after completion of each test.

## **PART 2 PRODUCTS**

### **2.01 FORM MATERIALS**

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

### **2.02 REINFORCING MATERIALS**

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. Provide welded wire fabric in flat sheets.
- C. Plate Dowels/Load Plates with Support Baskets: PNA Construction Technologies, Inc.; Manufacturer's representative: (508) 238-6775
- D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use plastic, wire bar type supports or concrete block supports complying with CRSI recommendations, unless otherwise specified. Wood, clay brick and other unspecified devices are not acceptable.
1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
  2. For slabs-on-grade, use supports chairs where base material is crete-heat.
  3. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 2).

### **2.03 CONCRETE MATERIALS**

- A. Single-Source Supplier: Ready-mix concrete shall be from one supplier unless specific written approval is received from the Structural Engineer.
- B. Portland Cement: ASTM C 150, Type I or Type II, unless otherwise approved Use one brand of cement throughout project, unless otherwise acceptable to Architect.
- C. Normal Weight Aggregates: ASTM C 33. Provide from a single source for exposed concrete. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, or ochre which can cause stains on exposed concrete surfaces.

- D. Light Weight Aggregates: ASTM C 330.
- E. Water: Potable.
- F. Air-Entraining Admixture: ASTM C 260.
- G. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G containing not more than 1% chloride ions.
- H. Fiber reinforcement shall be Type III Synthetic Virgin Homopolymer Polypropylene Fibers conforming to ASTM C1116. Fiber reinforcing shall be added and distributed prior to incorporation of Super Plasticizer.
- I. Normal range water reducing admixture: ASTM C 494 Type A containing no calcium chloride.
- J. Accelerating Admixture: ASTM C 494, Type C or E.
- K. Concrete Moisture Vapor Reduction Admixture: Barrier-1 High Performance Admixture manufactured by Barrier 1 Inc. added to the mix at batch plant or job site for all interior slabs-on-grade and elevated slabs. Refer to manufacturer's published specifications and data sheets for application, curing, quality control and repair recommendations. Comply with manufacturer's criteria to ensure manufacturer's full published warranty. Provide a copy of manufacturer's warranty for project closeout documents.
- L. Blast Furnace Slag: ASTM C989
- M. Fly Ash: ASTM C618, Class C or F
- N. Calcium Chloride is not permitted.

## 2.04 RELATED MATERIALS

- A. Underslab Vapor Retarder: Provide vapor retarder over prepared sub base as required. Refer to architectural drawings, geotechnical report and/or division 7 specifications for additional requirements and vapor retarder location.
- B. Non-Shrink Cement-based Grout: Provide grout consisting of pre-measured, prepackaged materials supplied by the manufacturer requiring only the addition of water. Manufacturer's instructions must be printed on the outside of each bag.
  - 1. Non-shrink: No shrinkage (0.0%) and a maximum 4.0% expansion when tested in accordance with ASTM C-827. No shrinkage (0.0%) and a maximum of 0.3% expansion in the hardened state when tested in accordance with CRD-C-621.
  - 2. Compressive strength: A minimum 28 day compressive strength of 5000 psi when tested in accordance with ASTM C-109.
  - 3. Setting time: A minimum initial set time of 60 minutes when tested in accordance with ASTM C-191.
  - 4. Composition: Shall not contain metallic particles or expansive cement.
- C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M182, Class 2.
- D. Moisture-Retaining Cover: One of the following, complying with ANSI/ASTM C 171.
  - 1. Waterproof paper.
  - 2. Polyethylene film.
  - 3. Polyethylene-coated burlap.
- E. Liquid Membrane-Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C 309, Type I, Class A unless other type acceptable to Architect. Curing compound shall not impair bonding of any material, including floor finishes, to be applied directly to the concrete. Demonstrate the non-impairment prior to use.
- F. Preformed Expansion Joint Formers:
  - 1. Bituminous Fiber Type, ASTM D 1751.

2. Felt Void, Poly-Styrene Cap with removable top as manufactured by SUPERIOR.
- G. Slab Joint Filler: Multi-component polyurethane sealant (self-leveling type).
- H. Waterstops shall be Bentonite/Butyl Rubberbased product. Use in conjunction with manufacturer's approved mastic. Acceptable products include:
  1. "Waterstop Rx," by American Colloid Co.
  2. "Adeka Ultra Seal MC-2010," by Asahi Denka Koeoyo, Kik MN.

## 2.05 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 318. Use material, including all admixtures, proposed for use on the project. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
- B. Submit written reports to Architect of each proposed mix for each class of concrete. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Proportion design mixes to provide concrete with the following properties:
  1. Footings and foundation walls
    - a. Strength: 3,500 psi at 28 days.
    - b. Aggregate: 3/4"
    - c. W/C Ratio: 0.55 maximum
    - d. Entrained Air: 6% +/- 1.5%
    - e. Slump: 4" maximum
  2. Interior Slabs on grade and elevated slabs to receive flooring (coordinate location with architect):
    - a. Strength: 3,000 psi at 28 days
    - b. Aggregate: 3/4" minimum, 1 1/2" maximum.
    - c. W/C Ratio: 0.52 maximum
    - d. Entrapped Air only (no entrainment), not to exceed 3% a point of discharge
    - e. Slump: 4" maximum
    - f. Barrier-1 High Performance Admixture manufactured by Barrier 1 Inc. Mix with concrete per manufacturer's recommendations. Reference section 2.03 of this specification for additional requirements.
    - g. Ready-mix supplier's submittal shall be reviewed and approved by Barrier-1 for compatibility and proper dose rate; provide evidence of acceptance of mix submittal by Barrier-1
  3. Interior Slabs on grade and elevated slabs exposed (coordinate location with architect):
    - a. Strength: 3,000 psi at 28 days
    - b. Aggregate: 3/4" minimum, 1 1/2" maximum.
    - c. W/C Ratio: 0.54 maximum
    - d. Entrapped Air only (no entrainment), 2.5% +/- 1%
    - e. Slump: 4" maximum
  4. Exterior Slabs and all other exposed Site Concrete not specified elsewhere:
    - a. Strength: 5,000 psi at 28 days

- b. Aggregate: 3/4"
    - c. W/C Ratio: 0.40 maximum
    - d. Entrained Air: 6% +/- 1.5%
    - e. Slump: 4" maximum
  - 5. Add air entraining admixture at manufacturers prescribed rate to result in concrete at point of placement having the above noted air contents.
  - 6. Additional slump may be achieved by the addition of a mid-range or high-range water reducing admixture. Maximum slump after the addition of admixture shall be 6 or 8 inches for mid-range or high range water reducing admixtures, respectively.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor, when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Structural Engineer before using in work.
- 1. Water may be added at the project only if the maximum specified slump and design mix maximum water/cement ratio is not exceeded.
  - 2. Additional dosages of superplasticizer should be used when delays occur and required slump has not been maintained. A maximum of two additional dosages will be permitted per ACI 212.3R recommendations.

## **2.06 CONCRETE MIXING**

- A. Job-Site Mixing will not be permitted.
- B. Ready-Mix Concrete: Must comply with the requirements of ASTM C 94, and as herein specified. Provide batch ticket for each batch discharged and used in work, indicating project name, mix type, mix time and quantity.
  - 1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required by Structural Engineer.
  - 2. When the air temperature is between 85 degrees F. and 90 degrees F., reduce the mixing and delivery time from 1 1/2 hours to 75 minutes, and when the air temperature is above 90 degrees F., reduce the mixing and delivery time to 60 minutes.

## **PART 3 EXECUTION**

### **3.01 FORMS**

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design, construct, erect, maintain, and remove forms for cast-in-place concrete work in compliance with ACI 347.
- C. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

- D. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, dovetail slots, reglets, recesses, and the like to prevent swelling and for easy removal.
- F. Provide temporary openings where interior area of formwork is inaccessible for clean out, for inspection before concrete placement and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- G. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- H. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
  - 1. Unless otherwise indicated, provide ties for concrete surfaces to be exposed to view in the final condition so portion remaining within concrete after removal is 1" (minimum) inside concrete.
  - 2. Form ties shall not leave holes larger than 1" diameter in concrete surface. Repair holes left by form ties after removal of formwork.
- I. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- J. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

### 3.02 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
  - 1. Subgrade tolerance shall conform to a tolerance of  $\pm 1 \frac{1}{2}$ ". Base tolerance (fine grading) for slabs shall conform to a tolerance of  $\pm 0 \frac{3}{4}$ " in. Confirm compliance of above tolerances with surveyed measurements taken at 20 ft. intervals in each direction.
  - 2. Concrete reinforcing and/or welded wire fabric shown on structural drawings is provided for structural purposes only; additional reinforcement may be necessary for reinforcing support, the anchorage of structural embedded items, and the anchorage of non-structural embedded items including but not by limitation radiant tubing. This reinforcing is not shown on the structural drawings as it is part of the contractor's means and methods and shall be included at no cost to the Owner.
  - 3. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.



4. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
5. Place reinforcement to obtain specified coverage for concrete protection within tolerances of ACI-318. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
6. Install diamond dowels at construction joints and load plates at contraction joints in slab-on-grade per manufacturer's recommendations and as indicated on Drawings.
7. Install welded wire fabric in flat sheets in as long lengths as practicable. Lap adjoining pieces at least one full mesh or 8 in which ever is larger and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

### 3.03 JOINTS

- A. Construction Joints: Locate and install construction joints, which are not shown on drawings, so as not to impair strength and appearance of the structure, as acceptable to Architect. Submit plan indicating proposed location of construction joints for review prior to beginning work.
  1. Provide keyways at least 1-1/2" deep in construction joints in walls, and slabs; bulkheads reviewed by the Engineer, designed for this purpose may be used for slabs.
  2. Roughened surfaces shall be used between walls and footings unless shown otherwise on the drawings. The footing surface shall be roughened to at least an amplitude of 1/4" for the width of the wall before placing the wall concrete.
  3. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.
  4. Joints in slabs on grade shall be located and detailed as indicated on the drawings. If saw-cut joints are required, the early-entry dry-cut process shall be used. Refer to ACI 302, section 8.3.12.

### 3.04 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set, securely anchor and build into work prior to concrete placement all anchorage devices and all other embedded items, including but not by limitation reinforcement, reinforcing dowels, embedded plates, anchor rods, anchor inserts, sleeves, load transfer plates, diamond dowels and shelf bulk heads required for other work that is attached to, bear upon, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto. Notify other trades to permit installation of their work. Templates to be utilized for setting of anchorage devices shall be constructed in a manner to allow mechanical consolidation of concrete without disturbance. Embedments shall be placed in a timely fashion to permit the inspection of embedments prior to concrete placement. **"Wet Setting" of embedded items into plastic concrete is strictly prohibited.**
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface.
- C. Provide PVC sleeves where pipes and/or conduit pass through exterior concrete or slabs. Sleeves or penetrations shall not be placed through footings, piers, pedestals, drop caps, columns or pilasters unless specifically noted.
- D. Tolerances: Tolerances for Anchor Bolts/Rods, other embedded items and bearing surfaces shall meet the requirement set forth in the latest edition of the American Institute of Steel Construction "Code of Standard Practice for Steel Buildings and Bridges," and ACI 117. The more stringent criteria from these documents shall apply.

**3.05 INSTALLATION OF GROUT**

- A. Place grout for base plates in accordance with manufacturer's recommendations.
- B. Grout below setting plates as soon as practicable to facilitate erection of steel and prior to removal of temporary bracing and guys. If leveling bolts or shims are used for erection grout shall be installed prior to addition of any column load.
- C. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials and allow to cure. For proprietary grout materials, comply with manufacturer's instructions.

**3.06 PREPARATION OF FORM SURFACES**

- A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating material manufacturer's directions. Do not allow excess form coating to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

**3.07 CONCRETE PLACEMENT**

- A. Preplacement Review: Footing bottoms are subject to review by the Geotechnical Engineer. Reinforcement and all concrete preparation work shall be subject to review by the Structural Engineer. Verify that reinforcing, ducts, anchors, seats, plates and other items cast into concrete are placed and securely held. Notify Engineer/Project Special Inspector 48 hours prior to scheduled placement and obtain approval or waiver of review prior to placement. Be sure that all debris and foreign matter is removed from forms.
- B. Concrete shall be placed in the presence of an approved testing agency.
- C. General: Comply with ACI 304, and as herein specified.
  - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.
  - 2. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.
  - 3. Conveying equipment shall be approved and shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or work day. Conveying equipment and operations shall conform to the following additional requirements:
    - a. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. An arrangement shall be used at the discharge end to prevent apparent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.
    - b. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long, and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

- c. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete.
    - d. Concrete shall not be conveyed through pipe made of aluminum alloy. Standby equipment shall be provided on the site.
    - e. Tined rakes are prohibited as a means of conveying fiber reinforced concrete.
  4. Do not use reinforcement as bases for runways for concrete conveying equipment or other construction loads.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 18 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
1. Consolidate placed concrete by mechanical vibrating equipment. Hand-spading, rodding or tamping as the sole means for the consolidation of concrete will only be permitted with special permission from the Engineer. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
  2. Use vibrators designed to operate with vibratory equipment submerged in concrete, maintaining a speed of not less than 8000 impulses per minute and of sufficient amplitude to consolidate the concrete effectively. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine, generally at points 18 inches maximum apart. Place vibrators to rapidly penetrate placed layer and at least 6 inches into the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion maintain the duration of vibration for the time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix, generally from 5 to 15 seconds. A spare vibrator shall be kept on the job site during all concrete placing operation.
- E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
1. Consolidate concrete using internal vibrators during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. Do not sprinkle water on plastic surface.
  3. Maintain reinforcing in proper position during concrete placement operations.
  4. Slab thicknesses indicated on the drawings are minimums. Provide sufficient concrete to account for structure deflection, subgrade fluctuations, and to obtain the specified slab elevation at the flatness and levelness indicated here within.
  5. Finish: See "Monolithic Slab Finishes" in this specification for slab finish requirements.
- F. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

1. When air temperature has fallen to or is expected to fall below 40 degrees F (4 degrees C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F (10 degrees C), and not more than 80 degrees F (27degrees C) at point of placement.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators.
  4. All temporary heat, form insulation, insulated blankets, coverings, hay or other equipment and materials necessary to protect the concrete work from physical damage caused by frost , freezing action, or low temperature shall be provided prior to start of placing operations.
  5. When the air temperature has fallen to or is expected to fall below 40 degrees F, provide adequate means to maintain the temperature in the area where concrete is being placed between 50 and 70 degrees F.
- G. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Mixing water may be chilled, or chopped ice may be used to control the concrete temperature provided the water equivalent of the ice is calculated to the total amount of mixing water.
  2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
  3. Wet forms thoroughly before placing concrete.
  4. Do not use retarding admixtures without the written acceptance by the Architect.

### **3.08 FINISH OF FORMED SURFACES**

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This concrete surface shall have texture imparted by form facing material, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 in. in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This as-cast concrete surface shall be obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment. Combine one part Portland cement to 1-1/2 parts fine sand by volume and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will closely match adjacent surfaces.
  1. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

- D. Related Unformed Surfaces: At tops of walls and grade beams, horizontal offset surfaces occurring adjacent to formed surfaces, strike-off, smooth and finish with a texture matching adjacent unformed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.09 FLOOR FLATNESS AND LEVELNESS

- A. Floor flatness/levelness tolerances: Tolerances for various floor uses shall conform to the requirements set forth in ACI 117 and ACI 302 for “flat” floor profile.
  - 1. Minimum Test Area Flatness/Levelness:  $F_F35/F_L25$
  - 2. Minimum Local F Number:  $F_F25/F_L15$
- B. Levelness criteria shall be applied to slabs-on-grade only.
- C. Contractor shall measure floor finish within 72 hours after slab finishing and provide corrective measures for finishes not within tolerance. Corrective procedures shall be reviewed by the Architect prior to implementation.

### 3.10 MONOLITHIC SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds, and as otherwise indicated.
  - 1. After placing slabs, plane surface to a tolerance not exceeding 1/2 in. in 10 ft. when tested with a 10-ft. straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, and as otherwise indicated.
- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces indicated, including slab surfaces to be covered with carpet, resilient flooring, paint or other thin-film finish coating system.
- D. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
- E. Slab finishes for floor coverings not indicated or exposed to view in the final condition shall be coordinated with the Architect prior to slab placement.
- F. Slab Joints: Where indicated, sawn slab contraction joints shall be “soft cut”, immediately after concrete surface is firm enough not to be torn or damaged by the blade.

### 3.11 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with the requirements of ACI 308 as herein specified.
- B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by curing compound, and by combinations thereof, as herein specified unless noted otherwise. Curing shall commence as soon as concrete surfaces are sufficiently hard as to withstand surface damage.
- C. Curing of Slabs-on Grade:
  - 1. Slabs-on-grade shall be cured by wet curing methods unless otherwise noted.



2. Slabs-on-grade to receive floor coverings with moisture sensitive adhesives shall be cured by means of a moisture retaining covering. Coordinate curing with flooring adhesive manufacturer and flooring installer. Submit curing methods to Architect for review and approval.
  3. Slab-on Grade with Barrier 1 Admixture shall be cured by means of a moisture retaining covering in accordance with recommendations of Barrier 1 Admixture Manufacturer.
- D. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- E. Protection From Mechanical Injury: During the curing period and duration of construction, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

### **3.12 REMOVAL OF FORMS:**

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as joints, slabs and other structural elements, may not be removed in fewer than 14 days or until concrete has attained design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
- C. Form facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and support.

### **3.13 REUSE OF FORMS**

- A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and latency, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

### **3.14 MISCELLANEOUS CONCRETE ITEMS**

- A. Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

### **3.15 CONCRETE SURFACE REPAIRS**

- A. **Patching Defective Areas:** Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to the Architect.
1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush coat the area to be patched with approved bonding agent. Place patching mortar after bonding compound has dried.
  2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- B. **Repair of Formed Surfaces:** Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, form tie holes, cracks, spalls, air bubbles, honeycomb, rock pockets, fins, and other projections on surface and stains and other discolorations that cannot be removed by cleaning.

### **3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION**

- A. Testing Agency/Project Special Inspector shall verify reinforcement, including foundation reinforcement and slab reinforcement (WWF or reinforcing bar). Agent shall verify WWF or reinforcement has been chair/placed with proper clearances.
- B. The Owner shall employ a Testing Laboratory to inspect, sample and test the materials and the production of concrete and to submit test reports. Concrete testing shall be performed by technicians certified by the Maine Concrete Technician Certification Board and/or ACI Concrete Field Testing Technician Grade I.
- C. Concrete shall be sampled and tested for quality control during placement. Quality control testing shall include the following, unless otherwise directed by the Architect.
- D. See Submittals section for report requirements.
- E. **Sampling Fresh Concrete:** ASTM C 172.
1. **Slump:** ASTM C143 One test for each set of compressive strength test specimens. Sample shall be taken from middle third of the load per ASTM C172. A slump test must be run prior to the incorporation of the CFP fibers per recommendations of ACI 544. A slump test must be run prior to and following the addition of a water reducer (superplasticizer) per recommendations of ACI 301.
  2. **Air Content:** ASTM C231 "Pressure method for normal weight concrete." One test for each set of compressive strength specimens measured at point of discharge.
  3. **Concrete Temperature:** Per ASTM C-1064; One test each time a set of compression test specimens are made.
  4. **Compression Test Specimen:** ASTM C31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
    - a. An insulated Cure Box for specimen curing shall be supplied by Testing Agency for initial curing as defined in ACI C31.
    - b. Means of heating or cooling the Cure Box shall be provided by the Inspection Agency if required in order to maintain a temperature between 60 and 80 degrees F. Contractor shall provide an electrical source to the Testing Agency when required for temperature control.

- c. A maximum-minimum thermometer shall be provided in the Cure Box by the Testing Agency to record the temperature range of the Cure Box during specimen curing. The Testing Agency shall record the maximum/minimum temperature of the Cure Box when transferring the specimens to the laboratory.
    - d. Test Specimens shall be moist cured.
    - e. Refer to ASTM C31 for additional requirements for Test Specimens.
  - 5. Compressive Strength Tests: ASTM C39; one set for each 50 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 4,000 sq. ft. of surface area placed; 1 specimen tested at 7 days, 3 specimens tested at 28 days, 1 specimen retained in reserve for later testing if required.
  - 6. Pumped concrete shall be tested at point of discharge per ACI 301.
- F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods, as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

**END OF SECTION**

**SECTION 03 35 13**  
**CONCRETE FLOOR FINISHING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Surface treatment with cure-seal-hardener.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: Prepared concrete floors ready to receive finish. Control and formed expansion and contraction joints and joint devices.

**1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- B. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2007.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with concrete floor placement, finishing and concrete floor curing.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on installation instructions, including information on compatibility of different products and limitations.
- C. Maintenance Data: Provide data on maintenance renewal of applied coatings.

**1.06 QUALITY ASSURANCE**

- A. Floor Finisher: Floor finishing contractor shall have at least five years of experience with the products specified in this Section and shall be trained and licensed by the manufacturer.

**1.07 MOCK-UP**

- A. Construct a sample installation, 8 feet x 8 feet, minimum in size, for each product and color used, to demonstrate workmanship and product finish. Unacceptable mock-ups shall be corrected and/or removed, with a new mock-up prepared. Accepted mock-ups may remain as part of the Work.

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in manufacturer's sealed packaging, including application instructions.

**1.09 FIELD CONDITIONS**

- A. Temporary Lighting: Maintain light level equivalent to a minimum of 50 footcandles on the floor surface.
- B. Do not finish floors until interior temporary heating system is operational, or outdoor temperatures allow a maintained ambient temperature of 50 degrees F minimum.
- C. Provide ventilation sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

**1.10 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide a twenty-year manufacturer's warranty that surface will remain dustproof, hardened and water repellant.

**PART 2 PRODUCTS****2.01 COMPOUNDS - HARDENER AND SEALER**

- A. Concrete Floor Cure-Seal-Hardener: Water based, no VOC, chemically reactive penetrating sealer and hardener that densifies concrete to make water impermeable, but air and vapor permeable.
  - 1. Coefficient of Friction, ASTM C1028: ADAAG & OSHA compliant; 0.86 dry; 0.69 wet.
  - 2. Hardening, ASTM C39: After 28 days, 38% increase over untreated samples.
  - 3. Light Exposure Degradation, ASTM G23: No evidence.
  - 4. Warranty: 20 years manufacturer limited.
  - 5. Color: Clear.
  - 5. Floor Finish: Level 2 Hard Shell, Medium Sheen Finish.
  - 6. Basis of Design: Ashford Formula by Curecrete Distribution Inc.
  - 7. Alternate Manufacturers:
    - a. BASF Construction Chemicals-Building Systems.
    - b. Dayton Superior Corporation.
    - c. Bomanite Vitra Floor.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that floor surfaces are acceptable to receive the work of this Section. Maintain interior temperatures within manufacturer's acceptable range.
- B. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1R and in accordance with manufacturer's recommendations.
- C. Mask adjoining concrete areas off where finish flooring systems are being installed in accordance with manufacturer's recommendations.
- D. Slabs to receive finish flooring shall be clean and dry. Slab moisture content shall be attained per manufacturer's recommendations. See Section 09 05 61 – Common Work Results for Flooring Preparation, for slab testing and preparation. Test slabs with a light water spray for uniform absorption. Do not proceed with installation until slab surfaces are acceptable to the manufacturer.

**3.02 CONCRETE FLOOR CURE-SEAL-HARDENER**

- A. Protect all surfaces not intended to receive hardener.
- B. Apply hardener immediately following finishing operations as soon as the surface is firm enough to walk on and before hairline checking and temperature cracking begins. Spray apply product with equipment and at pressures as recommended by the manufacturer. Work hardener into the slab with brooms. Mist floor as recommended by the manufacturer as floor material cures.
- C. Thoroughly flush the entire surface with water and squeegee completely dry to remove all surface alkali and hardener residue.
- D. Burnish floor surface twice to achieve sheen level of 25.

**3.03 PROTECTION**

- A. Prohibit traffic on floor finish as recommended by manufacturers. Barricade area to protect flooring until cured. Cure time to be recommended by concrete and hardener manufacturers.
- B. Protect exposed flooring areas from damage, staining, and marring from equipment for the remainder of construction. Use protection methods recommended in writing by the manufacturers.

**END OF SECTION**



**SECTION 04 20 00**  
**UNIT MASONRY****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Polished ground faced concrete block units, including standard & custom shapes, solid units and grout filled cores as required.
- B. Mortar and Grout.
- C. Reinforcement, Ties, and Anchorage.
- D. Flashings and accessories.
- E. Building-in of lintels, bearing plates, anchors and items supplied by other trades.
- F. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 – Cast-in-Place Concrete: Reinforcing dowels with foundation.
- B. Section 05 50 00 - Metal Fabrications: Loose steel lintels, embedded items.
- C. Section 06 10 54 - Wood Blocking and Curbing: Blocking and nailers at masonry.
- D. Section 07 21 00 - Thermal Insulation: Insulation for cavity spaces.
- E. Section 07 25 00 - Weather Barriers - Weather barrier and membrane flashings in cavity.
- F. Section 07 84 00 - Firestopping: Firestopping at penetrations of masonry work.
- G. Section 07 90 05 - Joint Sealers: Backing rod and sealant at control and expansion joints; compressible fillers at relieving angles.

**1.03 REFERENCE STANDARDS**

- A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.
- B. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- D. ASTM C91 - Standard Specification for Masonry Cement; 2012.
- E. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2011.
- F. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
- G. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- H. ASTM C150 - Standard Specification for Portland Cement; 2012.
- I. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2011.
- J. ASTM C270 – Standard Specification for Mortar for Unit Masonry, 2014.
- K. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- L. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
- M. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.
- N. ASTM C1142 - Ready-mixed Mortar for Unit Masonry.
- O. ASTM E447 - Masonry Prism Test
- P. ASTM E514 - Water Penetration and Leakage Through Masonry.
- Q. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete; 2010.

- R. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 2008.
- S. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2012.
- T. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.
- U. CRSI "Manual of Standard Practice", 28<sup>th</sup> Edition; 2009.
- V. UL - Fire Resistance Directory; current edition.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Convene a pre-installation meeting at least 1 month before starting work of this Section; require attendance by all relevant installers.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, masonry accessories, and all other manufactured products.
- C. Shop Drawings:
  - 1. Submit shop drawings of all masonry reinforcement detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 - Details and Detailing of Concrete Reinforcing, showing bar schedules, stirrup spacing, lap lengths, diagrams of bent bars, and arrangement of masonry reinforcement, including elevations of all reinforced walls. Wall elevations shall include reinforcing at all architectural and mechanical openings.
  - 2. Submit shop drawings of all special masonry shapes. Shop drawings shall indicate types of materials, finishes, dimensions, and anchorage. Shapes shall be represented in plan, elevation, and related details.
  - 3. Submit shop drawing plan indicating proposed locations of all construction joints in masonry walls.
- D. Samples:
  - 1. Submit two (2) samples of ground face block units to illustrate color, texture, and extremes of color range. Submit samples of concrete masonry units to illustrate surface quality and texture.
  - 2. Submit samples of each type of reinforcement, ties, anchors, flashing, expansion joints, joint fillers, weeps, etc.
- E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- F. Mix Designs and Test Reports: Submit in dependent testing lab certificates:
  - 1. CMU with integral water repellent admixture.
  - 2. Mortar mix designs and test results including proportions and mortar ingredients, prepared in accordance with ASTM C270.
  - 3. Grout mix designs and test results including description of type and proportions of grout ingredients, prepared in accordance with ASTM C476.
  - 4. Masonry unit's compression, absorption and measurement test result

#### **1.06 QUALITY ASSURANCE**

- A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the Construction Documents.
- B. For all concrete masonry units requiring a fire resistance rating, provide one of the following:
  - 1. Certification from Underwriter's Laboratories (UL) for products used in the tested assemblies as indicated on the Drawings. See tested assemblies appended to the end of this Section.
  - 2. Certification from a Maine state accredited testing agency certifying fire-resistance rating compliance in accordance with UL618 and ACI 216.1/TMS216.1 "Standard Method of

Determining Fire Endurance of Concrete and Masonry Construction Assemblies” for an equivalent product to that used in the tested assemblies as indicated on the Drawings.

3. For assemblies 1-hour fire-rated or less, provide documentation of calculated fire resistance per IBC Section 720 in accordance with ACI 216.1/TMS 216.1.
- C. Pre-construction Testing: If manufacturers published test reports are not available, the Contractor shall employ and pay an approved testing laboratory to perform pre-construction testing for:
  1. Concrete unit masonry tests for each different unit for strength, absorption, and moisture content per ASTM C140 and fire-resistive tests per UL 618 and ACI 216.1/TMS 216.1.
  2. Prism tests for each type of wall construction per ASTM E447.
  3. Mortar testing per ASTM C780.
  4. Grout compressive strength testing per ASTM C1019.

#### **1.07 MOCK-UPS AND SAMPLE PANELS**

- A. Mock-Up Panel(s): Construct masonry wall mock-up panel(s) sized 8 feet long by 6 feet high with an outside corner at least 2 feet long; including all components typical to the exterior wall construction, including but not limited to masonry units, mortar and accessories and flashings metal studs, sheathing, weather barrier, sealant, sample window, and insulation.
  1. Mock-up panel shall be constructed in a timely manner to allow for review and modifications if necessary prior to start of any related construction
  2. Contractor shall provide a concrete pad and all necessary support framing to hold mock-up panel in vertical position. Locate mock-up panel where directed by Architect
  3. Mock-up panel(s) shall be of proper thickness, showing proposed masonry color range, texture, bond, mortar joint and workmanship proper installation of various wall components, relationship of mortar and sealant colors to stone colors; tooling of joints; and aesthetic qualities of workmanship. No work shall progress until the Architect has reviewed the mock-up panel(s). Panel(s) shall be revised as necessary to secure the Architect's acceptance.
  4. Mock-up panel(s) shall then become the standard of comparison for all masonry work built of the same material. The panel(s) shall not be destroyed or moved until the Work is complete and accepted by the Architect.
  5. Contractor shall remove mock-up panel(s) after exterior punch-list is completed.

#### **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.
  1. The maximum moisture content of concrete block when laid shall not exceed 30% for exterior exposures and 25% for interior exposures (as a percent of total absorption and is in addition to moisture level required under ASTM C90).
- B. All mortar materials shall be stored under cover in a dry place.
- C. Reinforcement steel, ties, and anchors shall be protected from the elements and, before being placed, shall be free from loose rust and other coating, including ice that will destroy or reduce the bond.

### **PART 2 PRODUCTS**

#### **2.01 EXTERIOR CONCRETE MASONRY UNITS (CMU)**

- A. Polished Ground-Faced Concrete Units (GFCU) Types 1: ASTM C90, normal weight, hollow block, with smooth resinous facing complying with ASTM C744, manufactured with integral water-repellant admixture. Minimum average net area compressive strength 1,900 psi.
  1. Sizes and Shapes: 3 5/8" x 7 5/8" x 15 5/8" veneer and shapes as required for transitions to adjacent wall systems. No exposed cut edges will be accepted.
  2. Special Shapes: Sill blocks and other shapes as indicated on the Drawings.
  3. Face Finish:

- a. Exterior Applications: Provide polished ground-faced finish one face (exposed face) and at exposed corners and ends. Special shape corner units: solid, pre-cut by manufacturer in angles indicated per the Drawings.
  - 4. Colors (Basis of Design):
    - a. GFCU Type 1: Jet Black GF-109 by Genest.
  - 5. Bonds and Patterns: Running bond unless otherwise indicated on the Drawings.
  - 6. Applications:
    - a. Exterior: All CMU units unless otherwise indicated per the Drawings.
  - 7. Basis of Design: Mirra-Tex Plus by Genest Concrete Works, Inc.
  - 8. Alternate Manufacturers:
    - a. Trenwyth Industries.
    - b. A. Jandris & Sons
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Units with Integral Water Repellent: Concrete block units as specified in this Section with polymeric liquid admixture added to concrete masonry units at the time of manufacture.
- 1. Performance of Units with Integral Water Repellent:
    - a. Water Permeance: When tested per ASTM E514 and for a minimum of 72 hours.
      - 1) No water visible on back of wall above flashing at the end of 24 hours.
      - 2) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
      - 3) No more than 25% of wall area above flashing visibly damp at end of test.
    - b. Flexural Bond Strength, ASTM C1357: Minimum 10% increase.
    - c. Compressive Strength: ASTM C1314; Maximum 5% decrease.
    - d. Drying Shrinkage, ASTM C1148: Maximum 5% increase in shrinkage.
  - 2. Use only in combination with mortar and grout that also has integral water repellent admixture, all by a single manufacturer.
  - 3. Applications: All exterior CMU areas.
  - 4. Products:
    - a. Rheopel by BASF.
    - b. Dri-Block by W.R. Grace.
    - c. RainBloc by ACM Chemistries.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.02 INTERIOR CONCRETE MASONRY UNITS (CMU)**

- A. Concrete Units: ASTM C90, Type N1, normal weight, hollow block and solid soap block
- 1. Interior Applications: At interior partitions as shown on drawings.
    - a. Veneer solid soap blocks: 1 5/8" x 7 5/8" x 15 5/8" at partitions as shown on the drawings.
    - c. Veneer hollow cell blocks: 3 5/8" x 7 5/8" x 15 5/8" at partitions as shown on the drawings.
    - d. Special shape corner units: solid, pre-cut by manufacturer in angles indicated per the Drawings. No exposed cut edges will be accepted.
    - e. Other shapes, sizes and configurations as indicated in the Drawings.
  - 2. Special Shapes: Sill blocks and other shapes as indicated on the Drawings.
  - 3. Face Finish:
    - b. Interior Applications: Provide and prepare for finish paint in field under Section 09 90 00.
  - 4. Bonds and Patterns: Running bond unless otherwise indicated on the Drawings.
  - 5. Basis of Design: Genest Concrete Block Shapes
  - 6. Alternate Manufacturers:
    - a. Trenwyth Industries.
    - b. A. Jandris & Sons
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

**2.03 MORTAR MATERIALS**

- A. Mortar for Unit Masonry: Pre-mixed masonry cement; ASTM C270; ASTM C91, commercially prepared type of Portland Cement Type 1 and hydrated lime Type S.
  - 1. Exterior and interior masonry: Type S.
  - 2. Masonry below grade and in contact with earth: Type S., 1800 psi min.
  - 3. Products:
    - a. Quik-crete, Type S Portland/Lime Blend.
    - b. Blue Circle.
    - c. Eagle Bond.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Mortar for UL Design CMU: Comply with UL design requirements, not less than 2-1/4 and not more than 3-1/2 parts of clean sharp sand to 1 part Portland cement (proportioned by volume) and not more than 50 percent hydrated lime (by cement volume).
- C. Water Repellant Admixture shall be added to mortar mix for use with all concrete masonry units specified with water repellent admixture.
  - 1. Use only water repellent admixture for mortar and grout from the same manufacturer as water repellent admixture in masonry units.
  - 2. Applications All CMU wet areas including, exterior units.
- D. Grout: ASTM C476, 3,000 psi minimum 28-day compressive strength. Consistency required to fill completely volumes indicated for grouting.
  - 1. Fine grout shall be used for spaces less than 2" in either horizontal dimension.
  - 2. Mortar shall be used for spaces less than 3/4" in width or spaces less than 1-1/2" x 2" in horizontal dimensions.
  - 3. Coarse Grout shall be used for filling cavities 2" or larger in width or cells 2" x 3" or larger in horizontal dimensions.
  - 4. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
- E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.
  - 1. Colored mortar to be used at all polished ground faced concrete units unless otherwise indicated.
    - a. Intent: Polished Ground Faced Concrete Units: Up to (2) two colors, as selected by Architect from manufacturer's full range to match specified concrete units.
  - 2. Manufacturers:
    - a. Basis of Design: Davis Colors; Product True Tone Premium
    - b. Lambert Corporation
    - c. Solomon Colors
    - d. LeeHigh/Centurion, or Color Match.
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Mixing: Use mechanical batch mixer and comply with referenced standards.
- G. Water: Clean and potable.
- H. Admixtures: Admixtures shall not be used without the Architect's written permission, unless specified herein.

**2.04 REINFORCEMENT AND ANCHORAGE**

- A. Masonry Veneer Anchors: (For Masonry - Metal Stud Cavity Walls) Rib-stiffened, sheet metal plate with screw holes top and bottom. 2" (nom) x 3" (nom) with projecting tabs having slotted



holes for wire insert specifically formed to fit insulation. Include insulation-retaining wedge at each anchor.

1. Anchor Screws: Self tapping Type 304 stainless steel, hex head with factory neoprene washers, complying with ASTM B117, salt spray test result of no rust or other base metal corrosion after a minimum of 800 hours.
  2. Adjustable Wire Ties: Triangle shape, 3/16 inch thickness. Tie length shall be as required for a minimum 2" tie embedment in mortar.
  3. Products:
    - a. (Basis of Design) Blok-Lok Limited, BL407 to accommodate 4" insulation.
    - b. Acceptable Manufacturers:
      - 1) Hohmann & Barnard.
      - 2) Bloc-Lok.
      - 3) Heckman Building Products.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Corrugated Wall Ties: Corrugated formed sheet metal, 7/8 inch wide by 22 gauge 0.03 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B2, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
- a. Application(s): Interior applications detailing the use of "Soaps" and 4" CMU as a veneer installation, as indicated per the Drawings.

## 2.05 FLASHINGS

- A. Cavity Thru-Wall and Drip Edge Flashing (for termination of membrane flashings at exterior face of masonry and to support membrane flashing across cavities): 0.032 inch (26 gauge) Type 304 stainless steel continuous drip flashing, shape as indicated on the Drawings. Drip edge flashing shall extend into cavity to support membrane thru-flashing.
1. Membrane thru-flashing provided by Section 07 25 00 - Weather Barriers shall be adhered to the top surface of drip flashing.
- B. Reglet - Two-piece Cap Flashing: (For counter flashing at roof-wall intersections) Receiver formed of stainless steel with a special vertical locking slot to hold vertical component in place. Combination receiver and thru-wall flashing shall have 3/16" high undercut sawtooth ribs at 3" intervals to provide a mechanical bond in the mortar bed in all 3 directions. Insert member formed of stainless steel, designed to snap lock into the receiver and provide a spring like hug against the base flashing. Receiver shall be set with a thin bed of mortar below and above. Install counter joint lapped 3 inches.
1. Manufacturer: Keystone Manufacturing Co.
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gage, 0.0187 inch thick; finish 2B to 2D.

## 2.06 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. Wall Drainage Baffle: Polyester mesh panels designed for installation at flashing locations to prevent mortar droppings from clogging weeps. Size with of baffle to match depth of cavity.
1. Products:
    - a. Advanced Building Products Inc; Mortar Break DT.
    - b. Mortar Net USA, Ltd; Product MortarNet.
    - c. Weep Armor by York.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Weep Holes and Cavity Vents: Polypropylene honeycomb, full joint height, color as selected by the Architect.
1. Products:
    - a. Dur-O-Wal; Product DA 1006 Cell Vent.
    - b. Hohmann & Barnard, Inc; Product Quadrovent.

- c. Mortar Net USA, Ltd; Product Weep Vents.
  - d. Advanced Building Product; Mortar Maze Cell Vent.
  - e. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- E. Compressible Fillers: (Below relieving angles) See Section 07 90 05 - Joint Sealers.

## **PART 3 EXECUTION**

### **3.01 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.

### **3.02 PREPARATION**

- A. Direct and coordinate placement of metal anchors and reinforcement supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- C. Steel sleeves shall be installed for all piping and cabling through masonry construction. Coordinate with Fire Protection, Plumbing, Mechanical and Electrical Divisions.

### **3.03 PROTECTON OF WORK**

- A. During erection, all walls shall be kept dry by covering at the end of each day or shutdown period with a strong, waterproof membrane. Partially completed walls not being worked on shall be similarly protected at all times. Covering shall completely cover all projecting rebar and overhang walls at least 2' on each side, and shall be securely held in place.

### **3.04 COLD AND HOT WEATHER REQUIREMENTS**

- A. Comply with requirements of ACI 530/530.1/ERTA 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.
- D. Freezing Weather
  - 1. Masonry units, cementitious materials, and sand shall be protected so that they are not wetted by rain, snow, or ground water.
  - 2. If ice or snow has formed on masonry bed, remove by carefully applying heat until top surface is dry to the touch. Remove all frozen or damaged masonry.
  - 3. Units with suctions in excess of 30g/min/30 sq. in. shall be sprinkled with heated water just prior to laying. Water temperature shall be above 70 degrees F. when units are above 32 degrees F. Water temperature shall be above 130 degrees F. when temperature of units is 32 degrees F. or below.
  - 4. High-early-strength Portland cement (Type III) shall be used in mortars during freezing weather. If Type I or II Portland cement is used, the protection period shall be increased from 24 hr. to 48 hrs. Mortar temperatures shall be kept less than 120 degrees F. to avoid flash set.
  - 5. Construction Requirements (masonry being worked on)
    - a. Air Temperature 40 degrees F. to 32 degrees F.: Sand and mixing water shall be heated to produce mortar temperatures between 40 degrees F. and 120 degrees F.
    - b. Air Temperature 32 degrees F. to 25 degrees F.: Sand and mixing water shall be heated to produce mortar temperatures between 40 degrees F. and 120 degrees F. Maintain temperatures of mortar on boards above freezing.

- c. Air Temperature 25 degrees F. and below: Sand and mixing water shall be heated to produce mortar temperatures between 40 degrees F. and 120 degrees F. Masonry units shall not be laid unless temporary heat is available. Air temperature shall be maintained above 32 degrees F. Windbreaks shall be employed when wind is in excess of 15 mph. Minimum surface temperature of units when laid shall be 20 degrees F.
- 6. Protection Requirements (completed masonry or sections not being worked on).
  - a. Mean Daily Air Temperature 40 degrees F. to 32 degrees F.: Masonry shall be protected from rain or snow for 24 hours.
  - b. Mean Daily Air Temperature 32 degrees F. to 25 degrees F.: Masonry shall be completely covered for 24 hours.
  - c. Mean Daily Air Temperature 25 degrees F. and below: Masonry units shall not be laid unless heat is provided. Maintain masonry temperature above 32 degrees F. for 24 hours.
- E. Hot Weather
  - 1. In hot weather, when air temperatures exceed 90 degrees F, maintain the temperature of mortar and grout between 70 degrees F and 120 degrees F. Masonry and sand shall be stored in a shaded area to control materials temperatures. Mortar spreading shall be limited to four (4') feet and masonry units shall be placed within one minute of spreading the mortar. If weather conditions create excessively fast evaporation conditions, completed walls shall be fog sprayed with water at the end of the day.

### **3.05 COURSING, JOINTING AND BOND PATTERN**

- 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. All masonry work shall be properly coordinated as required to maintain aligned coursing throughout the building, unless specifically noted otherwise.
- D. Standard Concrete Masonry Units:
  - 1. Bond: Running Bond unless otherwise indicated per the Drawings.
  - 2. Mortar Joints: Concave.
  - 3. Joints scheduled to receive resilient floor base and other joints not exposed to view shall be flush-cut.
  - 4. Joints within exterior masonry cavity walls to receive vapor retarder membrane shall be flush tooled with the CMU surface and all CMU surface voids filled smooth.
- E. Sealant Recesses: Outside joints around the perimeter of exterior door and window frames or other wall openings shall be not less than 1/4" nor more than 3/8" wide, and shall be cleaned out to a uniform depth of at least 3/4" ready for placement of sealant by other trades.

### **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 full bed of mortar on head joints, bed joints, and webs.
- 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 where indicated.
- 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.

**3.07 WEEPS/CAVITY VENTS**

- A. Install weeps in veneer and cavity walls at 16 inches on center horizontally above through-wall flashing, above shelf angles and lintels, at bottom of walls, top of walls and other places indicated.

**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 diverter at base of cavity, and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

**3.09 REINFORCEMENT AND ANCHORAGE - GENERAL**

- A. Wall reinforcement shall be installed continuously in all masonry cavity walls, in all interior block walls and partitions and at all other locations identified on the Drawings or specified herein.
- B. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- C. Place concrete masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 24 inches each side of opening.
- D. Unless shown on the Drawings to be more closely spaced or where specifically indicated to be added, horizontal joint reinforcement for concrete masonry shall be installed in the first and second bed joints, 8" apart immediately above lintels and below sills at openings, and in bed joints at 16" vertical intervals elsewhere. Reinforcement in the second bed joint above or below openings shall extend two (2) feet beyond the jambs. All other reinforcement shall be continuous.
- E. Side rods shall be lapped a minimum of 6 inches at splices.
- F. Reinforcement shall be so placed as to assure a 1/2" minimum mortar cover on the faces of walls.
- G. Prefabricated or job fabricated corners and tee sections shall be used to form continuous reinforcement around corners and for anchoring abutting walls and partitions. Materials in corner and tee sections shall correspond to type and design of reinforcement used.
- H. Fasten anchors to structural framing abutting masonry and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 16 inches horizontally and 16 inches vertically.
- I. Structural steel clips shall laterally secure the tops of non-loading bearing masonry walls to building structure as indicated on the Structural Drawings.

**3.10 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHER MASONRY**

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.

**3.11 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER**

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 16 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.

1. Veneer anchors on the cavity side of the stud wall shall be set in a sealant bed. All penetrations through sheathing shall be sealed.

### **3.12 MASONRY FLASHINGS**

- A. Coordinate the installation of all flashings in masonry with flashings in Section 07 25 00 - Weather Barriers, to ensure that all required flashings to divert water to the exterior of the building are installed.
- B. 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. Drip flashings shall extend from 1/8 inch beyond exterior face of masonry, across the cavity and turn up face of cavity wall surface at least 4 inches. Membrane flashing shall seal to weather barrier and lap over drip flashing and extend down to 1 inch into brick veneer on top of the drip flashing.
  2. Remove or cover protrusions or sharp edges that could puncture flashings.
  3. Seal lapped ends and penetrations of flashing before covering with mortar.
- C. Drip flashing shall be laid in a slurry of fresh mortar and mortar shall be placed on top of the flashing as well to maintain wall flexural strength.
- D. Lap end joints of flashings at least 4 inches and seal watertight.

### **3.13 LINTELS**

- A. In general and except where indicated otherwise, masonry lintels shall be provided at all openings in CMU walls. See Structural Drawings for a schedule of masonry structural (hung) lintels (exterior).
- B. Loose steel angle lintels shall be provided for all openings in 4" CMU masonry as indicated in the lintel schedule. For miscellaneous loose steel lintels not specified on the structural drawings, refer to Section 05 50 00 - Metal Fabrications.
- C. Vertical cores below lintel ends shall be grouted solid full height to provide suitable bearing. Provide additional reinforcement and filled cores as indicated on the Drawings.
- D. See Architectural and Structural Drawings for additional information related to reinforced concrete masonry lintels.
- E. Temporarily brace lintels as required until mortar has adequately cured.
- F. Maintain minimum 8 inch bearing on each side of opening, unless otherwise indicated.
- G. A minimum of two courses below lintel ends shall be filled solid with mortar to provide suitable bearing.

### **3.14 GROUTED COMPONENTS**

- A. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.
- B. Clean concrete grout spaces of excess mortar and debris. Allow mortar to set. After observation of concrete grout spaces, plug clean-out holes with masonry units.
- C. Place grout in accordance with ACI 530 and NCMA guidelines. Grout shall be placed in four foot maximum vertical lifts, providing that minimum grout space dimensions of 2 inches x 3 inches are provided. Allow a minimum of 30 minutes and a maximum of one hour between lifts.
- D. Work concrete grout into cores, eliminating all voids. Mechanically vibrate grout during and after placement to ensure complete filling. Avoid segregation of grout materials. Do not displace reinforcing steel while placing concrete grout.

### **3.15 CONTROL AND EXPANSION JOINTS**

- A. Do not continue horizontal joint reinforcement through control or expansion joints.



- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Size control joint in accordance with Drawing details, but not less than 3/8" for installation of sealant and backer rod specified in Section 07 90 05. Keep joint free and clear of mortar.
- D. Build in horizontal, pressure relieving joints where indicated on the Drawings. Construct joints by inserting a compressible filler of width required and installing sealant and backer rod specified in Section 07 90 05 - Joint Fillers. Locate horizontal, pressure relieving joints beneath relieving (shelf) angles supporting masonry veneer and attached to structure behind masonry veneer.
- E. CMU Control Joints: For interior and exterior concrete masonry partitions in general as follows:
  - 1. At locations not to exceed 25' o.c., or 150% of the height of the CMU wall, or as otherwise indicated on the Drawings, whichever is less.
  - 2. Adjacent to corners and intersections of walls within a distance equal to half the general control joint spacing noted above.
  - 3. At changes in wall height or thickness.
  - 4. Above movement joints in foundations and floors.
  - 5. Below movement joints in foundations and floors.
  - 6. At one side of openings less than 6' wide and at both sides of openings more than 6' wide, located beyond opening reinforcing where applicable.
- F. Control joints in concrete masonry units shall be specially shaped units keyed to receive premolded synthetic rubber joints.

### **3.16 BUILT-IN WORK**

- A. As work progresses, install built-in metal door frames, anchors and plates 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 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.

### **3.17 TOLERANCES**

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation from Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft, 3/8 inch in any story and 1/2 inch in 40 feet or more.
- D. Maximum Variation from Plumb at openings (windows, doors, etc): 1/8 inch in total height of opening.
- E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in 40 feet or more.
- F. Maximum Variation from Level Coursing: 1/4 inch in any bay or 20 feet; 1/2 inch in 40 feet or more.
- 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.

### **3.18 NON-FIRE RATED AND ACOUSTICAL CONSTRUCTION**

- A. General: The following requirements shall apply to all non-fire rated masonry partitions and to all non-fire rated masonry partitions indicated on the Drawings to be "Acoustical Construction".
- B. Where the tops of non-load bearing partitions meet the underside of the structure above, and where gaps in partitions are provided to allow for the penetration of structural members, safin insulation shall be installed. Insulation shall be compression fit and shall not be visible from below.

- C. Acoustic Sealing and Smoke Sealing: Seal all cracks, joints, and voids in "Acoustical Construction" and in non-fire rated smoke partitions, air tight with sealing products specified in Section 07 90 05. Assemblies identified as "Acoustic Construction" are not fire-rated construction. Firestop products are required at fire-rated construction.
- D. Sealing top of masonry partitions for Acoustical Construction on two sides at interface of top of wall to deck flutes.
- E. Sealing all penetrations for pipes, conduits, structure, etc.

### **3.19 FIRE RATED CONSTRUCTION**

- A. General: The following requirements shall apply to all fire rated masonry partitions indicated on the Drawings.
- B. Where the tops of non-load bearing partitions meet the underside of the structure above, and where gaps in partitions are provided to allow for the penetration of structural members, safing insulation shall be installed. Insulation shall be compression fit and shall not be visible from below.
- C. Firestopping: Seal all cracks, joints, and voids in fire rated masonry partitions with firestop products specified in Section 07 84 00. Coordinate with the Work of Section 07 90 05.
- D. Masonry products and installations shall conform to the requirements of the specified U.L. listed assemblies.

### **3.20 CUTTING AND FITTING**

- A. Cut and fit for chases, pipes, sleeves, and ductwork. Coordinate with other Sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

### **3.21 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

### **3.22 CLEANING**

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. All exposed masonry shall be thoroughly cleaned. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately 20 sq. ft. in a location approved by the Architect. No further cleaning work may proceed until the sample area has been approved by the Architect, after which time the same cleaning materials and method shall be used on the remaining wall area. Adequate water shall be available to thoroughly pre-soak and rinse all surfaces to be cleaned.
- E. All traces of excess mortar/grout, all efflorescence and all other construction stains shall be completely removed from exposed masonry.

### **3.23 PROTECTION**

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
- B. Protect finishes until completion of project.

**END OF SECTION**

**SECTION 05 12 00**  
**STRUCTURAL STEEL****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

**1.02 DESCRIPTION OF WORK:**

- A. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.
- B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.

**1.03 RELATED WORK**

- 1. Section 05 20 00 – Open Web Steel Joists
- 2. Section 05 30 00 – Metal Deck
- 3. Section 05 50 00 - Metal Fabrications
- 4. Division 7 – Intumescent Paint.
- 5. Division 9 - finishes

**1.04 QUALITY ASSURANCE:**

- A. Codes and Standards: Comply with latest provisions of the following, except as otherwise indicated:
  - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges", Latest Edition.
    - a. The provisions of Section 10, "Architecturally Exposed Structural Steel", apply to exposed steel elements for this project. In addition, exposed welds and edges shall be ground to provide smooth surface.
    - b. Exclude the word "structural" in reference to the "Design Drawings" in section 3.1 of the Code.
  - 2. AISC "Specification for Structural Steel Buildings", including "Commentary" and Supplements issued thereto.
  - 3. AISC "*Specifications for Structural Joints using ASTM A 325 or A 490 Bolts*" approved by the Research Council on Structural Connections of the Engineering Foundation.
  - 4. AISC 341, "Seismic Provisions for Steel Buildings".
  - 5. AWS D1.1 - "Structural Welding Code" - Steel.
  - 6. AWS D1.3 - "Structural Welding Code" - Sheet Steel.
  - 7. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."

8. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure."
  1. Provide certification that welders to be employed in work have satisfactorily passed AWS D1.1 qualification tests and maintained a current certification. Current certification and/or continuity log shall be submitted and be available in the field.
  2. If re-certification of welders is required, retesting will be the Contractor's responsibility.
- C. Fabricator Qualifications:
  1. Fabricator must be a member of the American Institute of Steel Construction (AISC), be certified for BU – Certified Building Fabricator. Fabricator shall be certified at time of bidding and for duration of project.

## 1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with this section and Division 1.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. INCOMPLETE SUBMITTALS WILL NOT BE REVIEWED.
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.
- H. Electronic Submittals:
  1. Contractor shall include in the submittal schedule an indication of submittals that are intended to be submitted electronically. Upon receipt of the submittal schedule, the Engineer reserves the right to indicate submittals that will not be accepted electronically. Paper copies of such submittals shall be furnished as referenced in this specification.
  2. The Engineer reserves the right to require paper copies of submittals that are received electronically. Provide Engineer one (1) paper copies in addition to the electronic submittal. Paper copy will be retained and electronic copy will be returned. Review cycle for such submittals shall not commence until such time that the paper copies are received.
  3. Electronic Submittals shall be submitted in Protected Document Format (PDF) compatible with Bluebeam version 12 or later. Electronic files shall not be broken

- into smaller individual files. File sizes too large to process email or within a file transfer protocol (FTP) site shall be provided on a CD.
4. The submission of submittals electronically does not relieve the contractor of their responsibility to review the submittal prior to transmission to the Engineer. Electronic Submittals shall include contractor comments, and a statement and/or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with. Electronic submittals without the Contractor's approval will be rejected and returned.
  5. The Engineer assumes no responsibility for the printed reproduction of submittals reviewed electronically, transmission errors or returned electronic submittals that become corrupted or are otherwise not accessible by the Contractor's or Subcontractor's computer hardware and/or software.
- I. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
1. Structural steel certified mill reports for each grade of steel covering chemical and physical properties and yield strengths.
  2. High-strength bolts (each type), including nuts and washers.
  3. Structural steel primer paint (where applicable).
  4. Structural steel top coat paint (where applicable). (Refer to Section 09 90 00.)
  5. AWS D1.1 Welder certifications.
  6. Expansion/Adhesive Anchors (coordinate with section 03 30 00).
- J. Fabricator's Quality Control Procedures: Fabricator shall submit their written procedural and quality control manuals, and evidence of periodic auditing of fabrication practices by an approved inspection Agency.
- K. Fabricator's Certificate of Compliance: At completion of fabrication, fabricator shall submit a certificate of compliance stating that the work was performed in accordance with the construction documents.
- L. Shop Drawings:
1. Shop Drawing Review: Electronic files of structural drawings will not be provided to the contractor for preparation of shop drawings. Reproduction of any portion of the Construction Documents for use as Shop drawings and/or Erection Drawings is prohibited. Shop drawings and/or Erection drawings created from reproduced Construction Documents will be returned without review.
    - a. Review of the shop drawings will be made for the size and arrangement of the members and strength of the connections. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility.
    - b. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings indicating all members, braced frames, moment frames and connections. Incomplete submittals will not be reviewed.
  2. Connection Design: Submit design calculations prepared and stamped by a Professional Engineer registered in the State of Maine for all beam and column connections not tabulated in the AISC "Manual of Steel Construction" (ASD or LRFD). Submit design for all building braced frames where applicable, as indicated



on design drawings. Connection designs shall be submitted prior to or with the Shop Drawing Submittal.

- a. Fabricator and Erector are responsible to provide connections that meet the requirements of AISC standards. All shop and field welds, bolts, plates and miscellaneous components required to provide complete connection assemblies shall be provided.
  - b. Unless indicated otherwise, simple shear connections shall be provided for the full uniform load capacity of the beam for non-composite construction, and 1.5 times the full uniform load capacity of the beam for composite construction. All connections shall have a minimum of 2 bolts rows in the line of force, and no connection capacity shall be less than 10 kips (unfactored). A tabulation of the simple shear connections shall be provided with the connection submittal.
  - c. Braced frame connections: A brace force has been provided on the drawings. Braced frame connections shall be designed utilizing the Uniform Force Method, with a connection geometry that does not induce a moment on the connected beam or column.
  - d. To the greatest extent possible and where required herewithin, welds shall be designed and detailed to be installed downhand.
  - e. Column splices shall be designed and detailed per AISC standards. Column splices at braced frames and/or moment frames shall develop the full capacity of upper section
3. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of test conducted and test results.

## 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place, in ample time to not delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Steel materials shall be stored in a manner to avoid ponding of precipitation on members. Repair or replace damaged materials or structures as directed.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Structural Steel Shapes, Plates and Bars (U.N.O): ASTM A 36 minimum, higher strength steel is acceptable.
- B. Structural Steel Hot Rolled Wide Flange Shapes: ASTM A 992 Grade 50 (ASTM A572 Grade 50 with special requirements per AISC Technical Bulletin #3, dated March 1997)
- C. Steel Tube: ASTM A 500, Grade B,  $F_y = 46$  ksi.
- D. Steel Pipe: ASTM A 53, Grade B.
- E. Threaded Rods: ASTM A572, Grade 55, unless noted otherwise on the drawings.
- F. Anchor Bolts: ASTM F1554, Grade 36 weldable steel, unless noted otherwise on drawings. Anchor rods that are to be exposed to weather, located in unheated enclosures, or in contact with pressure treated lumber shall be hot dipped galvanized. All anchor bolts

shall be headed or double nutted. "J" or "L" type anchor bolts are not permitted. Unless otherwise noted, specified embedment it to top face of head or nut.

- G. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts. Provide hexagonal heads and nuts for all connections.
- H. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:
  - 1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325 or ASTM A490. Refer to drawings for diameter.
  - 2. Direct tension indicator washers or bolts may be used at Contractor's option.
  - 3. Provide hot-dipped galvanized fasteners at relieving angles.
- I. Steel Shear Studs: Headed type manufactured from steel conforming to ASTM A108 Grade C1015 by KSM or Nelson. Refer to Drawings for diameter and length.
- J. Deformed Bar Anchors, manufactured by Nelson and attached to structural steel. Refer to drawings for diameter and length.
- K. Electrodes for Welding:
  - 1. Minimum 70 ksi electrodes. Filler material shall meet the grouping requirements per AWS D1.1 Table 3.1 for matching strength of connected materials.
  - 2. All filler metal used welding shall meet the following Charpy V-Notch (CVN) requirements.
    - a. 20 ft-lb at 0 degrees Fahrenheit unless noted otherwise.
    - b. 20 ft-lb at -20 degrees Fahrenheit and 40 ft-lb at 70 degrees Fahrenheit at all complete joint penetration (CJP) groove welds.
- L. Structural Steel Coatings shall be as specified in the Structural Steel Coatings section of this specification, and as specified in Division 9.
- M. Steel Coatings for Exterior Exposed Steel: Except where indicated to be primed and painted, Hot Dipped Galvanized per ASTM A123/A123M (latest edition). Galvanizing shall be applied in a manner to provide Class C faying surfaces for slip critical connections. See Structural Steel Coatings section for additional requirements for galvanizing and painting.
- N. Non Shrink Cement-Based Grout: See Section 03 30 00
- O. Drilled Anchors: Expansion and adhesive by HILTI, SIMPSON or POWERS/RAWL as indicated on the drawings.

## 2.02 FABRICATION:

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.
  - 1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
  - 2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs and other defects.
- B. Connections: Weld or bolt shop connections, as indicated.
  - 1. Provide field bolted connections, except where welded connections or other connections are indicated.

2. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.
- C. High-Strength Bolted Connection: Install high-strength threaded fasteners in accordance with AISC "Specification for Structural Joints using ASTM A 325 or A 490 Bolts". Unless otherwise indicated, all bolted connections are to be tightened to the snug tight condition as defined by AISC.
- D. Welded Construction: Comply with AWS Codes for procedures, appearance and quality of welds, and methods used in correcting welding work.
- E. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.
- F. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- G. Fabricator, Erector and General Contractor shall coordinate safety requirements for the project, in accordance with OSHA Part 1926. Provide all necessary pieces and fabrications as required to safely erect and access the structure for the duration of project construction.
- H. Camber, if any, is indicated on the drawings. Camber indicated is the required camber at time of erection. Contractor shall survey camber prior to placing metal deck
- I. All exposed end of HSS tubes and pipes to be capped with 1/4" thick plates welded all around including but not limited to end of braces.
- J. All exposed columns and braces to be fabricated to meet the requirements of Section 10 of the Code of Standard Practice, "Architecturally Exposed Structural Steel".

### 2.03 STRUCTURAL STEEL COATINGS

- A. Coordinate coating requirements with the Architect, and with Division 7 and 9 of the specifications.
- B. To the greatest extent possible, structural steel coatings shall be shop applied.
- C. Coordinate steel markings with coating system to eliminate "bleed through" on steel permanently exposed to view.
- D. All exposed steel to be receive intumescent coating. Coordinate with Division 7. Preparation of all exposed columns and braces to meet the requirements of Section 10 of the Code of Standard Practice, "Architecturally Exposed Structural Steel".
- E. Provide venting/drainage holes in closed tubular members to be hot-dipped galvanized. Holes shall be provided in a location hidden from view in the final condition and in a manner that will not reduce the strength of the member. Hole locations shall be clearly indicated on the Shop Drawings and are subject to review by the Architect.
- F. Follow manufacturer's installation and safety instructions when applying coatings. Adhere to recoat time recommendations set forth by manufacturer.
- G. General: Shop priming of structural steel is not required for heated, interior steel not exposed to view unless noted otherwise.
- H. Steel which is to receive spray-on fireproofing shall not to be primed or painted, unless specified by the Architect.
- I. Coatings: All exterior steel and/or steel permanently exposed to view shall receive a coating. Unless noted otherwise, refer to Division 7 and 9 specifications for products and surface preparation requirements.
- J. Brick masonry loose lintels and relieving angle assemblies, including fasteners, shall be hot dipped galvanized, unless noted otherwise on the Architectural Drawings. Complete all shop fabrication prior to galvanizing assemblies.
- K. Unheated structural steel to be enclosed with architectural finishes, including but not by limitation, canopy members and/or roof pop-up members shall be primed with rust inhibitive mio-zinc filled primer, Tnemec Series 394 unless noted otherwise. Follow

manufacturer's instructions for surface preparation and application. Substitution shall be equal to the above specified products, and shall be submitted for review.

- L. Steel Embedded in Concrete/Below Grade: Steel which is embedded in concrete, below grade/slab level, or as otherwise indicated on the drawings, shall be field painted with cold-applied asphalt emulsion complying with ASTM D 1187. Paint embedded areas only. Do not paint surfaces which are to be welded until welding is complete.
- M. Field Touch-up: Touch-up all paint and galvanizing damage, including but not by limitation, damage caused during shipping, erection, construction damage, and field welded steel. See Division 9 specifications for additional requirements.

## **PART 3 EXECUTION**

### **3.01 ERECTION:**

- A. General: Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- B. Erection Procedures: Comply with "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- C. Surveys: Employ a Registered Land Surveyor to verify elevations of concrete bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect and Structural Engineer. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been approved by Structural Engineer of Record. Additional surveys required to verify out-of-alignment work and/or corrective work shall be performed at the contractor's expense.
- D. Temporary Shoring and Bracing: This is the sole responsibility of the Contractor. Provide temporary shoring and bracing members with connections of sufficient strength to support imposed loads. Remove temporary members and connections when all permanent members are in place, and all final connections are made, including the floor and roof diaphragms. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds. Comply with OSHA Standard referenced previous. Retain the services of a Specialty Structural Engineer (Not the Engineer of Record) to design specialty shoring and bracing.
- E. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
  - 1. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
  - 2. Welding to anchor bolts for corrective measures is strictly prohibited without prior written approval from the Engineer.
- F. Setting Plates and Base Plates:
  - 1. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations. Refer to division 3 of the project Specifications for anchor bolt installation requirements in concrete.
  - 2. Clean concrete bearing surfaces of bond-reducing materials. Clean bottom surface of setting and bearing plates.
  - 3. Set loose and attached base plates for structural members on wedges or shims until fully grouted support is provided. If shown on drawings, anchor bolt nuts under base plates are not intended for erection support of base plate or column.

4. Pack non-shrink grout solidly between bearing surfaces and bases or leveling plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's instructions.
- G. Concrete slabs that are part of elevated floors framing systems shall achieve 28-day design strength prior to the application of any superimposed loads such as curtain walls, masonry veneer, mechanical equipment and stairs. Additional testing beyond that specified in division 3 required to verify the concrete strength prior to application of superimposed loads shall be done at the Contractor's expense.
- H. When installing expansion bolts or adhesive anchors, the contractor shall take measures to avoid drilling or cutting any existing reinforcement or damaging adjacent concrete. Holes shall be blown clean with compressed air and/or cleaned per manufacturer's recommendations prior to the installation of anchors.
- I. Field Assembly:
  1. Set structural frames accurately to lines and elevations indicated.
  2. Align, adjust, level and plumb members of complete frame in to the tolerances indicated in the AISC Code of Standard Practice and in accordance with OSHA regulations.
  3. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly.
  4. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  5. Splice members only where indicated and accepted on shop drawings.
  6. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
  7. Composite shear studs / deformed bar anchors shall be installed using stud welding process with an appropriately sized insulating ferrule. Fillet welding of shear studs is not permitted. Ferrules shall be broken free from the shear studs and removed from the deck surface along with all other debris.
- J. Tolerances: Erection tolerances shall meet the "Code of Standard Practice" except as noted. Cumulative tolerances of framing elements shall not exceed the available tolerances of façade support systems to ensure and provide a plumb façade face.
- K. Coat columns, base plates, and brace elements encased in concrete and/or below grade with cold-applied asphalt emulsion. Coordinate coating with concrete work.
- L. Erection bolts: Remove erection bolts. On exposed welded construction and at all braced frame members fill holes with plug welds and grind smooth at exposed surface.
- M. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as accepted by the Engineer of Record. Finish gas-cut sections equal to a sheared appearance when permitted.
- N. Coating Damage: Touch up shop applied paint or galvanizing whenever damaged or bare. See "Coatings" sections for additional requirements.
- O. Field Cut Beam Web Penetrations:
- P. Field cut beam web penetrations are not permitted without written approval from the Structural Engineer.



1. Gas cutting torches are not permissible for cutting beam web penetrations without written approval from the Structural Engineer.
  2. Beams with field cut beam web penetrations may require reinforcement, subject to the evaluation by the Structural Engineer.
  3. The evaluation of field cut web penetrations by the Structural Engineers for Design-Build Subcontractors, including but not by limitation, Mechanical, Electrical, Plumbing and Sprinkler Subcontractors shall be compensated by the General Contractor or Design-Build Subcontractor.
  4. The cost of executing field cut web penetrations and the associated beam reinforcement for Design-Build Subcontractors, including but not by limitation, Mechanical, Electrical, Plumbing and Sprinkler Subcontractors shall be paid for by the General Contractor or Design-Build Subcontractor.
  5. Field cut beam web penetrations may not be permitted in certain locations, subject to the evaluation by the Structural Engineer.
- Q. Welders shall have current evidence of passing and maintaining the AWS D1.1 Qualifications test available in the field.
- R. Welding electrodes, welding process, minimum preheat and interpass temperatures shall be in accordance with AISC and AWS specifications. Any structural steel damaged in welding shall be replaced.
- S. Field Welded Moment Connections:
1. Backing materials for top and bottom flanges for field welded moment connections shall be removed, backgouge the weld root, and apply a reinforcing fillet weld.
  2. Where top flange steel backing materials are utilized, the backing may be left in place. In this case, the backing material shall be welded with a reinforcing fillet weld.

### 3.02 QUALITY CONTROL:

- A. General: Contractor is responsible for maintaining quality control in the field and for providing a structure that is in strict compliance with the Contract Documents.
1. Required inspection and testing services are intended to assist the Contractor in complying with the Contract Documents. These specified services, however, do not relieve the Contractor of his responsibility for compliance, nor are they intended to limit the Contractor's quality control efforts in the field.
- B. Testing: Owner shall engage an Independent Testing Agency to inspect all high-strength bolted and welded connections, to perform tests and prepare reports of their findings. All connections must pass these inspections prior to the installation of subsequent work which they support.
1. Testing agency shall conduct tests and state in each report which specific connections were examined or tested, whether the connections comply with requirements, and specifically state any deviations therefrom.
  2. Contractor shall provide access for testing agency to places where structural steel work is being fabricated, produced or erected so that required inspection and testing can be accomplished. Testing agency may inspect structural steel at plant before shipment. The Engineer, however, reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.
- C. Inspection Requirements (to be performed by the Independent Testing Agency):

1. Bolted Connections: Inspect all bolted connections in accordance with procedures outlined in the AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts.
2. Snug Tight Bolted Connections:
  - a. The inspector shall monitor the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.
  - b. If the inspector does not monitor the installation of bolts, he shall visually inspect the connection to determine that all plies of connected material have been drawn together and conduct tests on a sampling connection bolts to determine if they have been tightened to the snug tight condition. The test sample shall consist of 10% of the bolts in the connection, but not less than two bolts, selected at random. If more than 10% of the tested bolts fail the initial inspection, the engineer reserves the right to increase the number of bolts tested.
3. Slip Critical Bolted Connections:
  - a. The inspector shall monitor the calibration of torquing equipment and the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.
  - b. If the inspector does not monitor the calibration or installation procedures, he shall test all bolts in the affected connection using a manual torque wrench to assure that the required pretension has been reached.
4. Field Welded Connections: inspect and test during fabrication of structural steel assemblies, and during erection of structural steel all welded connections in accordance with procedures outline in AWS D1.1. Record types and location of defects found in work. Record work required and performed to correct deficiencies.
  - a. Certify welders and conduct inspections and tests as required. Submit welder certifications to Engineer of Record. Perform visual inspection of all welds. Primary and secondary welds, including fillet welds, full penetration welds, and deck puddle welds, applied in the field and/or shop, shall be visually inspected.
  - b. Welds deemed questionable by visual inspection shall receive non-destructive testing. In addition, all partial and full penetration welds, and any other welds indicated on the drawings are to receive non-destructive testing. Non-destructive testing methods include the following:
    1. Radiographic Inspection (RT): ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
    2. Ultrasonic Inspection (UT): ASTM E 164.
    3. Magnetic Particle (MT) inspection procedures may be utilized at the inspectors discretion in addition to RT or UT inspection. MT procedures shall not replace RT or UT procedures without permission from the Structural Engineer.
  - c. All welds deemed unacceptable shall be repaired and retested at the Contractor's expense.

D. Composite Shear Studs/Deformed Bar Anchors:

1. Verify shear stud quantity and arrangement.

2. Visually inspect stud weld. A weld less than 360 degrees is cause for further testing by bending to 15 degrees per item 2 below. Strike all studs with a 3 pound sledge hammer with moderate force. Studs shall make a ringing sound when struck with the hammer. If a stud or studs break free, or fails to make a ringing sound, further testing shall be performed per item 4.
  3. One stud in 100 shall be tested by bending to 15 degrees from vertical, and one stud in 200 shall be tested by bending to 30 degrees from vertical. Single bent studs may be left bent. Failure of stud weld during bend testing is cause for further testing per item 4.
  4. When failure occurs during bend testing, additional bend testing shall be performed on 10 studs to either side of failed stud. Bend studs to 30 degrees from vertical. If failure occurs during additional testing, continue testing in series of 10 studs beyond failed stud until no failure occurs.
  5. Straighten all studs that were bent in multiple stud testing. Replace all studs that fail.
- E. Inspector shall verify that all ferrules are removed when applicable and that metal deck is free of debris prior to concrete placement.
- F. Testing and inspection reports shall be submitted to the Owner, Architect and Engineer within 48 hours of completion of each test or inspection.
- G. Nonconforming Work: Contractor shall be responsible for correcting deficiencies in structural steel work which inspections laboratory test reports have indicated to be not in compliance with requirements. Additional tests and/or surveys shall be performed, at the Contractor's expense, as may be necessary to show compliance of corrected work. Any costs associated with the Engineer's review and disposition of faulty works shall be borne by the Contractor.

#### **END OF SECTION**

**SECTION 05 20 00**

**OPEN WEB STEEL JOISTS**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS:**

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section.
- C. Coordinate work with that of all trades affecting or affected by work of this section. Cooperate with such trades to assure the steady progress of all work under the Contract.

**1.02 DESCRIPTION OF WORK:**

- A. Extent of steel joists is shown on drawings, including basic layout and type of joists required.
- B. Related work specified elsewhere:
  - 1. Section 05 12 00 - Structural Steel
  - 2. Section 05 30 00 - Metal Decking
  - 3. Section 05 50 00 - Metal Fabrications

**1.03 QUALITY ASSURANCE:**

- A. Codes and Standards:
  - 1. Steel Joist Institute (SJI) Standard Specifications, Load Tables and Weight Tables-latest revisions-for:
    - a. K-Series Open Web Steel Joists as designated on the Contract Drawings.
    - b. LH/DLH Series Open Web Long Span Steel Joists as designated on the Contract Drawings.
  - 2. Steel Joist Institute (SJI) Recommended Code of Standard Practice for Steel Joists and Joist Girders, latest revision.
  - 3. AWS D1.1 "Structural Welding Code" – Steel
  - 4. AWS D1.3 "Structural Welding Code" - Sheet Steel
  - 5. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Qualification for Welding Work: Qualify welding processes and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure".
  - 1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.

2. If recertification of welders is required, retesting will be the Contractor's responsibility.

#### **1.04 SUBMITTALS:**

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with this section and Division 1.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.
- H. Electronic Submittals:
  1. Contractor shall include in the submittal schedule an indication of submittals that are intended to be submitted electronically. Upon receipt of the submittal schedule, the Engineer reserves the right to indicate submittals that will not be accepted electronically. Paper copies of such submittals shall be furnished as referenced in this specification.
  2. The Engineer reserves the right to require paper copies of submittals that are received electronically. Provide Engineer one (1) paper copies in addition to the electronic submittal. Paper copy will be retained and electronic copy will be returned. Review cycle for such submittals shall not commence until such time that the paper copies are received.
  3. Electronic Submittals shall be submitted in Protected Document Format (PDF) compatible with Bluebeam version 12 or later. Electronic files shall not be broken into smaller individual files. File sizes too large to process email or within a file transfer protocol (FTP) site shall be provided on a CD.
  4. The submission of submittals electronically does not relieve the contractor of their responsibility to review the submittal prior to transmission to the Engineer. Electronic Submittals shall include contractor comments, and a statement and/or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with. Electronic submittals without the Contractor's approval will be rejected and returned.
  5. The Engineer assumes no responsibility for the printed reproduction of submittals reviewed electronically, transmission errors or returned electronic submittals that become corrupted or are otherwise not accessible by the Contractor's or Subcontractor's computer hardware and/or software.



- I. Product Data: Submit manufacturer's specifications and installation instructions for each type of joist and accessories. Include manufacturer's certification that joists comply with SJI Standard Specifications. Product data shall include:
  1. Joist steel component certified mill reports for each grade of steel covering chemical and physical properties and yield strengths.
  2. Steel joist primer paint.
  3. Welder certifications
- J. Shop Drawings:
  1. Shop Drawing Review: Electronic files of structural drawings will not be provided to the contractor for preparation of shop drawings. Reproduction of any portion of the Construction Documents for use as Shop drawings and/or Erection Drawings is prohibited. Shop drawings and/or Erection drawings created from reproduced Construction Documents will be returned without review.
    - a. Review of the shop drawings will be made for the size and arrangement of the members and strength of the connections. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility.
    - b. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings indicating all joist members, bridging, connections and accessories. Incomplete submittals will not be reviewed.
  2. Design
    - a. Unless noted otherwise, steel joists shall be designed to support the uniformly distributed loads per the "Standard Load Tables" by the Steel Joist Institute. An allowance for MEP equipment and architectural component loads has been included in the uniformly distributed design load (include 15 plf on along bottom chord). The joist design shall allow a 150 pound concentrated hanger load be applied at any location along either the top or bottom chord of the joists that is part of the MEP equipment and architectural component allowance, without additional reinforcement.
    - b. Calculations for SP joists: Submit design calculations for special steel joists indicated on Contract Drawings by SP designation, Joist Girders or as otherwise noted. Submit calculations stamped by a Registered Professional Engineer licensed to practice in the State of Maine. Design joists for the loads indicated on the Contract Drawings with a vertical deflection due to live load not exceeding: 1/360 of the span for roof joists where plaster ceiling is attached or suspended, and 1/240 of the span for all other roof joists. Concentrated loads applied to SP joists are to be applied as Live Loads unless otherwise indicated.
  3. Evidence of in-plant inspections: Per SJI requirements, each manufacturer shall verify his ability to manufacturer steel joists through periodic in-plant inspections. Inspections shall be performed by an independent testing agency. Submit evidence of participation in SJI in-plant inspections program.
  4. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of test conducted and test results.

**1.05 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- C. Deliver, store and handle steel joists as recommended in SJI Standard Specifications and SJI Technical Digest #9 "Handling and Erection of Steel Joists and Joist Girders". Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses. Protect joist members and packaged materials from corrosion and deterioration.

**PART 2 PRODUCTS****2.01 MATERIALS:**

- A. Steel: Comply with SJI Standard Specifications.
- B. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular hexagon type, low carbon steel
- C. High-Strength Bolts and Nuts: ASTM A325, Type I, heavy hex structural bolts, heavy hex nuts and hardened steel washers.
- D. Steel Primer Paint: Manufacturer's standard shop paint conforming to Steel Structures Painting Council Specification: SSPC-Paint 15 "Steel Joist Shop Primer", or a shop paint which meets the minimum performance requirements of SSPC-Paint 15.

**2.02 FABRICATION:**

- A. General: Fabricate steel joists in accordance with SJI Standard Specifications.
- B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists; deduct area of holes from the area of chord when calculating strength of member.
- C. Openings in Web: Coordinate openings in joist and joist girder webs to allow through passage of HVAC, sprinklers, etc. in locations shown on the drawings.
- D. Extended Ends: Provide extended ends on joists where shown and where deck extends beyond supports, complying with manufacturer's standards and requirements of applicable SJI Standard Specifications and Load Tables. Unless noted otherwise, "R" type extended ends shall be utilized.
- E. Uplift: Roof joists shall be designed for a net uplift of 20 psf (35psf at perimeter and corners).
- F. Camber: Camber in accordance with SJI Standard Specifications. Joists shall not be manufactured with negative camber.
- G. Bridging:
  - 1. Provide horizontal or diagonal type bridging for "open web" joists, complying with SJI Standard Specifications and any additional requirements shown on Contract Drawings. Bridging layout shall be clearly indicated on the shop drawings.
  - 2. Provide bridging anchors for ends of bridging lines terminating at walls or beams.

3. Provide bottom chord bridging for uplift, in accordance with SJI Standard Specifications, and SJI Technical Digest #6 "Structural Design of Steel Roof Joists to Resist Uplift Loads" when the above noted uplift load is greater than zero.
- H. End Anchorage: Provide end anchorages to secure joists to adjacent construction, complying with SJI Standard Specifications, unless otherwise indicated. Roof joists shall be anchored to resist the above noted uplift force.
  1. Minimum final connection each side of joist seat, unless noted otherwise, shall be as follows:
    - a. "K" Joists: 2 inches, 1/8" fillet weld or (2) 1/2" diameter A307 Bolts
    - b. "LH" Joists: 2 inches, 1/4" fillet weld, or (2) 3/4" diameter A325 Bolts (slip critical)
- I. Shop Painting:
  1. Remove loose scale, heavy rust and other foreign materials from fabricated joists and accessories before application of shop paint in accordance with SSPC-SP 1 and SSPC-SP 2.
  2. Apply one shop coat of primer paint, SSPC-Paint 15, or better, to steel joists 2.0 to 3.0 mils DFT (dry film thickness) measurement in accordance with SSPC-PA 2.

### **PART 3 EXECUTION**

#### **3.01 ERECTION:**

- A. General: Place and secure steel joists in accordance with SJI Standard Specifications, final shop drawings, and as herein specified. Comply with "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Placing Joists:
  1. Do not start placement of steel joists until supporting work is in place and secured.
  2. Place joists on supporting work, adjust and align in accurate location and spacing before permanently fastening.
  3. Provide temporary bridging, connections and anchors to ensure lateral stability during construction.
- C. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
- D. Fastening:
  1. Joist at column lines shall be bolted with a minimum (2) 3/4" diameter A325 bolts in a slip critical type connection. Stabilizer plates welded to the columns shall be provided at the bottom chord angles at all column lines. Do not weld bottom chord angles to stabilizer plate unless noted otherwise.

2. Field weld joists to supporting steel framework in accordance with SJI Standard Specifications for type of joists used. Coordinate welding sequence and procedure with placing of joists.
  3. Bolt joists to supporting steel framework in accordance with SJI Standard Specifications for type of joists used.
- E. Reinforcement for Concentrated Loads: Reinforcing angles shall be applied for concentrated loads in excess of 150 pounds applied to joists. The reinforcing angles shall transfer the concentrated loads to a joist panel point. Unless noted otherwise, hung elements shall be attached to the joist top chords. Hangers and hanger accessories shall be designed by a Specialty Structural Engineer Registered in the State of Maine (Not the Engineer of Record).
- F. Touch-up painting: Clean field welds, bolted connections, and abraded areas, and apply same type of primer paint as used in shop.

### 3.02 QUALITY CONTROL:

- A. General: Contractor is responsible for maintaining quality control in the field and for providing a structure that is in strict compliance with the Contract Documents.
- B. Required inspection and testing services are intended to assist the Contractor in complying with the Contract Documents. These specified services, however, do not relieve the Contractor of his responsibility for compliance, nor are they intended to limit the Contractor's quality control efforts in the field.
- C. Testing: Owner shall engage an Independent Testing Agency to inspect all puddle welded connections, to perform tests and prepare reports of their findings. All connections must pass these inspections prior to the installation of subsequent work which they support.
- D. Joist Inspection Requirements (to be performed by the Independent Testing Agency):
- E. Testing:
  1. Joist connections, bringing connections and field splices shall be tested as indicated in specification section 05120. Work found to be defective will be removed and replaced at the Contractor's expense.
  2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests. If re-certification of welders is required, re-testing will be the Contractor's responsibility.

### END OF SECTION

**SECTION 05 30 00**  
**METAL DECKING**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

**1.02 DESCRIPTION OF WORK**

- A. Extent of metal floor and roof deck is shown on the drawings and includes type VL composite floor deck, roof deck, cell closures, end plates, pour stops with vertical leg return lip, metal lath column closures, composite finish strips, welding washers and sump plates or pans.

**1.03 RELATED WORK**

- 1. Section 05 12 00 - Structural Steel
- 2. Section 05 20 00 – Open Web Steel Joists
- 3. Section 05 50 00 - Metal Fabrications

**1.04 QUALITY STANDARDS**

- A. Codes and Standards: Comply with provisions of the following codes and standards, except where more stringent requirements are indicated or specified:
  - 1. AISI "Specification for the Design of Cold Formed Steel Structural Members".
  - 2. AWS D1.1 "Structural Welding Code" - Steel
  - 3. AWS D1.3 "Structural Welding Code" - Sheet Steel
  - 4. Steel Deck Institute (SDI) "Design Manual for Floor Decks and Roof Decks".
  - 5. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Qualification of field welding: Qualify welding process and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure."

**1.05 SUBMITTALS**

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with this section and Division 1.



- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.
- H. Electronic Submittals:
  - 1. Contractor shall include in the submittal schedule an indication of submittals that are intended to be submitted electronically. Upon receipt of the submittal schedule, the Engineer reserves the right to indicate submittals that will not be accepted electronically. Paper copies of such submittals shall be furnished as referenced in this specification.
  - 2. The Engineer reserves the right to require paper copies of submittals that are received electronically. Provide Engineer one (1) paper copies in addition to the electronic submittal. Paper copy will be retained and electronic copy will be returned. Review cycle for such submittals shall not commence until such time that the paper copies are received.
  - 3. Electronic Submittals shall be submitted in Protected Document Format (PDF) compatible with Bluebeam version 12 or later. Electronic files shall not be broken into smaller individual files. File sizes too large to process email or within a file transfer protocol (FTP) site shall be provided on a CD.
  - 4. The submission of submittals electronically does not relieve the contractor of their responsibility to review the submittal prior to transmission to the Engineer. Electronic Submittals shall include contractor comments, and a statement and/or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with. Electronic submittals without the Contractor's approval will be rejected and returned.
  - 5. The Engineer assumes no responsibility for the printed reproduction of submittals reviewed electronically, transmission errors or returned electronic submittals that become corrupted or are otherwise not accessible by the Contractor's or Subcontractor's computer hardware and/or software.
- I. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.
- J. Shop Drawings:
  - 1. Shop Drawing Review: Electronic files of structural drawings **will not** be provided to the contractor for preparation of shop drawings.

- a. Submit detailed drawings showing layout and types of deck panels, galvanizing, shop paint, anchorage details, and conditions requiring closure panels, supplementary framing, sump pans, cant strips, cut openings, special jointing, and all other accessories. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility.
- b. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings. Incomplete submittals will not be reviewed.

## **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Store materials to permit easy access for inspection and identification. Keep deck sheets off ground, using pallets, platforms, or other supports. Protect deck sheets and packaged materials from corrosion and deterioration.
- C. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Materials shall be stored in a manner to avoid ponding of precipitation on members. Repair or replace damaged materials or structures as directed.

## **PART 2 PRODUCTS**

### **2.01 GENERAL**

- A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
  1. United Steel Deck
  2. Wheeling Corrugating Co.
  3. Epic Metals Corporation
  4. Vulcraft
- B. Materials:
  1. Steel for Metal Deck Units:
    - a. Floor Deck Units: ASTM A1008, Grade C, D or ASTM A653, Structural Quality, grade 40 or higher
    - b. Roof Deck Units: ASTM A1008, Grade C, D, or E, or ASTM A653, Structural Quality, grade 33 or higher.
  2. Miscellaneous Steel Shapes: ASTM A36 minimum.
  3. Sheet metal Accessories: ASTM A526, commercial quality, galvanized.
- C. Galvanizing: Conform to ASTM 924-94 with minimum coating class of G60 (Z180) as defined in ASTM A653-94.
- D. Paint: Manufacturer's baked on, rust inhibitive paint, for application to metal surfaces which have been chemically cleaned and phosphate chemical treated.

- E. Flexible closure Strips: Manufacturer standard vulcanized, closed-cell, synthetic rubber.

## **2.02 FABRICATION**

- A. General: Form deck units in lengths to span 3 or more supports, unless otherwise noted on the drawings, with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated. For roof deck units, provide deck configurations complying with SDI "Roof Deck Specifications," of metal thickness, depth and width as shown.
- B. Metal Cover Plates: Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking. Form to match contour of deck units and approximately 6" wide.
- C. Metal Closure Strips: Fabricate metal closure strips, cell closures, "Z" closures, column closures, pour stops, girder fillers and openings between decking and other construction, of not less than 0.045" min. (18 gage) sheet steel or as indicated on the drawings. Form to provide tight fitting closures at open ends of cells or flutes and sides of decking.
- D. Pour Stops: Minimum material thickness shall be 18 gage or as indicate on drawings.. Fabricate vertical leg to accommodate specified slab thickness. Fabricate horizontal leg to minimize field cuts. Provide welded attachment sufficient to resist forces during concrete placement.
- E. Roof Sump Pans: Fabricate from a single piece of 0.071" min. (14 gage) galvanized sheet steel with level bottoms and sloping sides to direct water flow to the drains, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide. Recess pans not less than 1 1/2" below roof deck surface, unless otherwise shown or required by deck configuration. Holes for drains will be cut in the field.
- F. Provide all pour stops and accessories necessary to contain concrete for poured concrete surfaces.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.
- B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before permanently fastened. Deck shall be in full contact with members parallel to ribs and attached as indicated. Do not stretch or contact side lap interlocks.
- C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
- D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.
- E. Coordinate and cooperate with the structural steel erector in locating decking bundles to prevent overloading of structural members.
- F. Do not use decking units for storage or working platforms until permanently installed.

### **3.02 FASTENING**

- A. Floor Deck: Fasten metal deck to supporting steel members as indicated on the Design Drawings: Each deck is to be fastened with a minimum of 5/8" diameter puddle welds spaced not more than 12" o.c. with a minimum of 2 welds per unit at each support. Secure deck units at 6" oc along brace lines, edge of building or at the edge of openings or deck discontinuity. Secure deck to each supporting member in ribs where sidelaps occur. Use welding washers where recommended by the deck manufacturer. Deck units shall bear over the ends of supports by a minimum of 1.5. Sidelaps: #10 Tek screws, 5/8" arc puddle welds or 1" long fillet welds, intervals not exceeding 36 inches. Crimped or button punched sidelaps are not permitted.
- B. Roof Deck: Unless more stringent requirements are required on plans, each deck is to be fastened with a minimum of 5/8" diameter puddle welds spaced in 36/7 pattern (1.5B deck) with a minimum of 2 welds per unit at each support if incomplete sheet is utilized. Where support is parallel to support, at edge of building, at brace lines, at edge of opening or deck discontinuity provide puddle welds at 6" o.c. Secure deck to each supporting member in ribs where sidelaps occur. Deck units shall bear over the ends of supports by a minimum of 1.5". Sidelaps: #10 Tek screws, 6 per span for B deck.
- C. Welding: Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Uplift loading: Floor deck units are not required to resist uplift loads. Decking units used at the roof level shall be designed for a net uplift of 20 psf (35psf at perimeter and corners).
- E. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking.
- F. Reinforcement at openings: Provide additional metal reinforcement and closures pieces as required for strength, continuity of decking and support of other work shown.
  - 1. Deck penetrations affecting no more than (1) deck rib need not be reinforced.
  - 2. For deck penetration affecting more than (1) deck rib, but less than 10", reinforce the opening with a 0.057" thick plate spanning between unaffected ribs, unless otherwise shown on the Design Drawings or supporting a piece of mechanical equipment (see item 3).
  - 3. Reinforce deck penetrations larger than 10" with the structural frame described in the Design Drawings.
- G. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units.
- H. Roof Sump Pans: Place over openings provided in roof decking and weld to top decking surface. Space welds not more than 12" on center with at least 1 weld in each corner. Cut opening in roof sump bottom to accommodate drain size indicated.
- I. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking, and in voids between decking and other construction. Weld into position to provide a complete decking installation.
- J. Touch-Up Painting:
  - 1. Painted Deck: After decking installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.
    - a. Touch up painted surfaces with same type paint used on adjacent surfaces.

- b. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

### **3.03 QUALITY CONTROL**

- A. General: Contractor is responsible for maintaining quality control in the field and for providing a structure that is in strict compliance with the Contract Documents.
- B. Required inspection and testing services are intended to assist the Contractor in complying with the Contract Documents. These specified services, however, do not relieve the Contractor of his responsibility for compliance, nor are they intended to limit the Contractor's quality control efforts in the field.
- C. Testing: Owner shall engage an Independent Testing Agency to inspect all puddle welded connections, to perform tests and prepare reports of their findings. All connections must pass these inspections prior to the installation of subsequent work which they support.
- D. Deck Testing Requirements (to be performed by the Independent Testing Agency):
  - 1. Deck and accessory welding and/or attachments subject to inspection and testing. Work found to be defective will be removed and replaced at the Contractor's expense.
  - 2. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests. If re-certification of welders is required, re-testing will be the Contractor's responsibility.

**END OF SECTION**

**SECTION 05 40 00**  
**COLD-FORMED METAL FRAMING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Formed steel stud exterior and interior wall framing.
- B. Exterior wall sheathing.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 12 00 - Structural Steel Framing.
- B. Section 04 20 00 - Unit Masonry: Veneer masonry supported by CFMF stud wall.
- C. Section 06 10 54 - Wood Blocking and Curbing: Wood blocking.
- D. Section 07 25 00 - Weather Barriers: Weather barrier over sheathing.
- E. Section 07 42 13 - Metal Wall Panels: Minimum CFMF requirements for load support of metal wall panel and associated subgirt systems provided under Section 07 42 13.
- F. Section 09 21 16 - Gypsum Board Assemblies: Interior metal stud partition, soffit and ceiling framing.

**1.03 REFERENCE STANDARDS**

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
- B. ANSI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions.
- C. ANSI S211 - North American Standard for Cold-Formed Steel Framing-Wall Stud Design.
- D. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- E. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- F. ASTM A1003 - Standard Specification for Steel Sheet, Carbon, Metallic-Coated and Non-metallic-Coated for Cold-Formed Framing Members; 2005.
- G. 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 inch to 0.112 inch in Thickness; 2004.
- H. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2011a.
- I. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2004.
- J. ASTM C1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
- K. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with work of other Sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors and subgirt systems, utilities, insulation, windows and doors, wall openings, weatherbarriers and firestopping, etc...

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.



- B. Product Data: Provide data on standard framing members and fasteners; describe materials and finish, product criteria, limitations.
  - 1. Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, and type and location of fasteners, and accessories or items required of related work. All shop drawings shall bear the seal of the licensed structural engineer employed by the CFMF subcontractor, licensed in Maine.
  - 1. Indicate stud layout.
  - 2. Describe method for securing studs to tracks and for bolted framing connections.
  - 3. Provide design engineer's stamp on shop drawings.
  - 4. Provide calculations for loadings and stresses of all framing that bear the seal of the licensed structural engineer employed by the CFMF subcontractor and licensed in Maine.
    - a. Submit record copy of loads and reactions provided under Section 07 42 13 for metal wall panel and associated subgirt systems with this submission. Purpose of submission is to show CFMF coordination for support of such loads has been provided.
    - b. Submit locations and calculations of studs to be used in "double height" interior applications and masonry veneer, wall higher than 16'-0" above finished floor. Show layouts established by General Contractor.
- D. Samples: Upon request, submit samples of materials specified herein.

#### **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Maine.
- B. Manufacturer Qualifications:
  - 1. Company specializing in manufacturing the types of products specified in this Section, and with minimum fifteen (15) years of documented experience.
  - 2. Member in good standing of the Steel Framing Industry Association. Products shall be certified under an independent third party inspection program administered by an agency accredited by IAS to ICC-ES AC98 IAS Accreditation Criteria for Inspection Agencies.
- C. Installer Qualifications: Company specializing in performing the work of this Section with minimum ten (10) years of experience.

#### **1.07 MOCK-UPS**

- A. Provide metal stud framing for exterior and interior wall mock-up(s) specified in Section 04 20 00 - Unit Masonry and Section 07 42 13 - Metal Wall Panels.
  - 1. Mock-up panel(s) shall demonstrate actual wall construction, detailing and workmanship.
  - 2. No work shall progress until the Architect has reviewed the mock-up panel(s). Panel(s) shall be revised as necessary to secure the Architect's acceptance and shall then become the standard of comparison for all related exterior and interior wall work.
  - 3. Mock-up panel(s) shall not be destroyed or moved until the Work is complete and accepted by the Architect. Upon completion of construction, mock-up panel(s) shall be removed.

#### **1.08 PRE-INSTALLATION MEETING**

- A. At least two weeks prior to start of installation of metal framing systems, and after shop drawings have been approved by the General Contractor, meet at project site with installers of other work including door and window frames and mechanical and electrical work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

**1.09 DELIVERY, STORAGE AND HANDLING**

- A. Protect and store metal framing units from rusting and damage in accordance with AISI Code of Standard Practice. Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type, and grade. Store off ground in a dry ventilated space or protect with suitable waterproof covering.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Metal Framing:
  - 1. Dietrich Metal Framing.
  - 2. Marino\Ware.
  - 3. EB Metals.
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 FRAMING SYSTEM**

- A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- B. Design Criteria: Provide completed framing system having the following characteristics:
  - 1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S-100 North American Specification for the Design of Cold-Formed Steel Structural Members.
  - 2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
  - 3. Design Loads: In accordance with applicable codes and/or as specified on the Structural Drawings.
    - a. Where requirements conflict the contractor shall adhere to the more stringent requirement.
  - 4. Live load deflection meeting the following, unless otherwise indicated:
    - a. Horizontal Deflection: Design to permit maximum deflection of 1/720 of span of framing supporting masonry veneer exterior walls.
    - b. Horizontal Deflection: Design to permit maximum deflection of 1/360 of span for exterior metal wall finish.
    - c. Vertical Deflection: Design framing to accommodate deflection of the structural steel framing members.
  - 5. Provide industry standard safety factors as suited to specific job conditions.
  - 6. 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.
  - 7. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

**2.03 FRAMING MATERIALS**

- A. Studs and Track: ASTM A1003 sheet steel, structural grade, Type H; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
  - 1. Thickness: As required to meet specified performance levels, but in no case less than 43 mils thickness.
  - 2. To the extent that component types and thicknesses are indicated in the Construction Documents, they shall be considered minimum requirements to be verified and increased (but not decreased) as determined to be necessary by the fabricator's licensed structural engineer. Framing member depths indicated on the Drawings shall not be altered without the Architect's prior written authorization.
  - 3. Stud spacing shall not exceed 16 inches on center.

4. Galvanized in accordance with ASTM A653 G60/Z180 coating.
- B. Framing Connectors: Factory-made formed steel sheet, ASTM A653 SS Grade 50, with factory punched holes.
  1. Material: ASTM A653 SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for thicknesses less than 10 gage (0.118 inch), and factory punched holes and slots.
  2. Coating: G90/Z275 hot dipped galvanized coating.
  3. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
  4. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
    - a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical movement of slab without affecting studs; allow for minimum movement of 1 inch.
    - b. Where top of stud wall terminates below structural floor, connect studs to structure in manner allowing vertical movement of slab without affecting studs; allow for minimum movement of 1 inch.
    - c. Manufacturers:
      - 1) Dietrich
      - 2) Superstud
      - 3) Simpson Strong Tie
  5. Channel Bridging and Bracing: U-channel; minimum 0.0538" thickness; minimum 0.5" wide flanges; depth as indicated or required.
  6. Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, gusset plates, and stiffeners.

## 2.04 WALL SHEATHING

- A. Wall Sheathing: Glass mat faced gypsum; ASTM C1177, square long edges, 5/8 inch Type X fire-resistant. Use in all exterior locations and behind interior masonry veneer locations.
  1. Products:
    - a. DensGlass Gold by Georgia-Pacific.
    - b. Fiberock Sheathing with Aqua-Tough by USG.
    - c. GlasRoc Sheathing Type X by Certainteed - BPB America Inc.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.05 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Plates, Gussets, Clips: Formed Sheet Steel, thickness determined for conditions encountered; finish to match framing components.
- C. Clips (For securing CFMF to structural components intended to receive sprayed-on fireproofing): Galvanized steel, depth as required for thicknesses of fireproofing, size and thickness as determined by CFMF system engineering.
- D. Sill Gaskets: Continuous 1/4" thickness closed cell foam from continuous rolls, for use under CFMF tracks on concrete at building perimeters. Seal all joints.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of Authorities Having Jurisdiction.

**2.06 FASTENERS**

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Size, type, penetration and spacing shall be in strict accordance with the CFMF contractor's engineered design requirements.
  - 1. Coating: Corrosion resistant, high performance polymer complying with ASTM B117; salt spray test result of no rust or other base metal corrosion after a minimum of 800 hours.
- B. Anchorage Devices: Powder actuated. Welding is NOT allowed.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.

**3.02 INSTALLATION OF STUDS**

- A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.
- B. Install sill gaskets continuously on perimeter concrete surfaces, prior to track installation.
- C. Install continuous tracks sized to match studs. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Provide fasteners at corners and ends of tracks. Coordinate installation of sealant with floor and ceiling tracks.
- D. Place studs plumb, at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.
- E. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- F. Abutting Structure: Where stud system abuts structural column or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
- G. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
- H. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
- I. Wall Openings: Frame wall opening larger than 2 feet square with additional studs (2 minimum) at each jamb of frame as required by the engineered design. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes and space jack studs same as full-height studs of wall.
- J. Install intermediate studs above and below openings to align with wall stud spacing.
- K. Secure studs to top and bottom runner tracks by screw fastening at both flanges. Provide deflection head track directly below horizontal building framing at non-load bearing framing.
- L. Supplementary Framing: Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the walls or partitions. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations, engineering and industry standards in each case, considering weight or loading requirements resulting from item supported.
- M. Attach cross studs to studs for attachment of fixtures anchored to walls.
- N. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- O. Touch-up damaged galvanized surfaces with primer.

**3.03 WALL SHEATHING**

- A. General: Inspect materials to which gypsum sheathing is to be applied. Remedy all defects prior to installation of sheathing. Provide additional studs and bracing if required to secure sheathing at outside corners or board joints.
- B. Wall Sheathing: Cut sheathing by scoring or sawing. Gypsum sheathing shall be fitted tightly to abutting sheathing. All joints shall be closed tight. Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.
  - 1. Coordinate sheathing installation with requirements of the air barrier system. If gaps in sheathing exceed requirements of Section 07 25 00 - Weather Barriers, they shall be taped with product recommended by Weather Barrier manufacturer.
- C. Sheathing shall be held in firm contact with substrate while fasteners are being driven. Sheathing shall be fastened as determined and detailed by the engineered design. Unless otherwise indicated, space fasteners a maximum of 8 inches o.c. around perimeter and in field at framing locations. Care shall be taken not to break sheathing face while driving fasteners.
- D. Fastening Sheathing: Gypsum board at exterior walls may be an integral part of the structural lateral stud bracing of the masonry veneer. Coordinate with the requirements of the engineered design.

**3.04 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements for general requirements for testing and inspections.
- B. Testing and inspection shall be performed by the Owner's Testing Agency as identified in the Statement of Special Inspections.
- C. If work is found not to conform to the Construction Documents, the Contractor shall be responsible for the cost of all further testing and repair or replacement measures.

**3.05 TOLERANCES**

- A. Maximum Variation from True Position: 1/8 inch per 10'.
- B. Maximum Variation of any Member from Plane: 1/8 inch per 10'.

**END OF SECTION**

**SECTION 05 50 00  
METAL FABRICATIONS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Shop fabricated miscellaneous steel and aluminum items, including but not limited to:
  - 1. Frames, brackets and supports for:
    - a. Overhead coiling grilles and doors.
    - b. Overhead sectional doors.
    - c. Part-height wall partition braces.
    - d. Shipping Container structures.
    - e. Supports for hardware, mechanical equipment, electrical equipment, fixtures and other items as indicated or required.
  - 2. Loose lintels not furnished under Section 05 12 00 - Structural Steel.
  - 3. Bollards.
  - 4. Pit covers and frames, elevator sill supports and pit ladders.
- B. Prefabricated ladders and ship ladders.
- C. It shall be a requirement of the Work of the Section to thoroughly review all of the Construction Documents and provide any and all miscellaneous metal fabrications required for a complete and proper job.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 20 00 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 12 00 - Structural Steel.
- D. Section 05 51 00 - Metal Stairs.
- E. Section 07 81 00 – Applied Fireproofing: Compatibility of fireproofing systems with primers included in this Section, where applicable.
- F. Section 07 81 23 – Intumescent Mastic Fireproofing: Compatibility of fireproofing systems with primers included in this Section, where applicable.
- G. Section 08 36 00 - Overhead Doors
- H. Section 09 90 00 - Painting and Coating: Compatibility of paint finish systems with primers included in this Section, where applicable.
- I. Section 14 20 10 - Passenger Elevators.

**1.03 REFERENCE STANDARDS**

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.
- B. ASTM A36 - Standard Specification for Carbon Structural Steel; 2008.
- C. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- D. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- E. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- F. ASTM A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2012.
- G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.



- H. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
- I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- J. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2012.
- K. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012e1.
- L. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- M. AWS D1.1 - Structural Welding Code - Steel; American Welding Society; 2010.
- N. AWS D1.2 - Structural Welding Code - Aluminum; American Welding Society; 2008.
- O. OSHA 1910.27 - Fixed Ladders.
- P. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- Q. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- R. SSPC-SP; Society for Protective Coatings; 1982 (Ed. 2004).

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit for manufactured products specified herein.
- C. 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. Submit lintel fabrication schedule including location, type, size, length and finish (primed or galvanized coating class, prepared for field painting).
- D. Certifications:
  - 1. Submit seismic analysis certification sealed and signed by a registered professional structural engineer in the State of Maine, that all equipment stands, frames, and supports comply with applicable codes.
  - 2. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
  - 3. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.
  - 4. Submit documentation of steel fabricator's in-plant special inspections program including registration of special inspections program, written procedural and quality control manuals and evidence of periodic auditing of fabrication practices by an approved inspection agency.
- E. Samples: Submit samples representative of materials and finished products as may be requested by the Architect.

#### **1.05 QUALITY ASSURANCE**

- A. Fabricator's Qualifications: Only fabricators that maintain an agreement with an approved independent inspection or quality control agency to conduct periodic in-plant inspections at the fabricator's plant, at a frequency that will assure the fabricator's conformance to the requirements of the inspection agency's approved quality control program will be approved for this project.
- B. Design equipment supports under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Maine.
- C. Welding Standards: Comply with applicable provisions of ASW D1.1 "Structural Welding Code - Steel" and ASW D1.3 "Structural Welding Code - Sheet Steel".

**1.06 PRODUCT HANDLING**

- A. Delivery of Materials: Deliver, store and handle components in such a manner as to prevent damage to finished surfaces.
- B. Storage of Materials: Store components in a dry, clean location, away from uncured masonry and concrete. Cover with tarpaulin or polyethylene sheeting. Rusting or scaling steel shall not be incorporated into the work.

**PART 2 PRODUCTS****2.01 MATERIALS - STEEL**

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A 53, Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A653 Grade 33, electro-galvanized steel metal channel framing and ASTM A1011 channel fittings system
  - 1. Engineered, fabricated and installed by the manufacturer's authorized installer with a minimum of ten (10) years of experience.
  - 2. Field inspection to verify job conditions, dimensions and suitability of primary structure to receive channel framing.
  - 3. Engineering of all channel framing, attachments between framing members, attachments between framing systems and building structure, and anchor points to receive attachments by the manufacturer of the building material or equivalent to be supported by the channel framing systems.
  - 4. Coordination of framing load capacity and anchor point types and locations with the requirements of the related material or equipment manufacturer.
  - 5. Submission of structural calculations including, but not limited to design criteria, stress and deflection analysis and selected framing, fittings and anchors prepared by a professional structural engineer licensed in the State of Maine.
  - 6. Manufacturer: Unistrut Corp.
    - a. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Fasteners: ASTM B33, Class FE/An 25 for electro-plated zinc coating, for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.
  - 1. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
  - 2. Machine Screws: ANSI B18.6.3.
  - 3. Lag Bolts: ANSI B18.2.1.
  - 4. Expansion Anchors: Carbon steel components zinc-plated to comply with ASTM B633.
- G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

**2.02 MATERIALS - ALUMINUM**

- A. Extruded Aluminum: ASTM B221, 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209, 5052 alloy, H32 or H22 temper.
- C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210, 6063 alloy, T6 temper.
- D. Aluminum-Alloy Bars: ASTM B211, 6061 alloy, T6 temper.
- E. Bolts, Nuts, and Washers: Stainless steel.

- F. Welding Materials: AWS D1.2; type required for materials being welded.

## **2.03 FABRICATION**

- A. The Contractor is encouraged to use recycled steel products, to the greatest extent practical.
- B. Metal fabrications shall be standard approved products, fabricated in accordance with best shop practices and, wherever possible, shop assembled, ready for erection.
- C. Metals shall be free from defects impairing strength, durability, or appearance and shall be best commercial quality for purposes specified. Metals shall be made with structural properties, to safely sustain and withstand strains, stresses, to which they will be normally subjected.
- D. Fit and shop assemble items in largest practical sections, for delivery to site.
- E. Fabricate items with joints tightly fitted and secured.
- F. Continuously seal joined members by continuous welds.
- G. 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.
- H. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- I. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## **2.04 FABRICATED ITEMS**

- A. Miscellaneous Framing and Supports: Provide steel framing and supports for applications indicated that are not a part of structural steel scope as required to complete the Work. Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent construction. Fabricate from steel shapes, plates, and steel bars of welded construction using mitered joints for field connections. Cut, drill, and tap units to receive hardware, hangers, and similar items. Equip units with integrally welded anchors for casting into concrete or building into masonry.
  - 1. Part-height Stud Partition Posts: Support frame and post assembly shall be completely concealed within the wall partition. Posts shall be fabricated for attachment of adjacent metal studs, with welded baseplates and holes for expansion bolting to concrete floor slabs. Partition heights shall be as indicated on the Drawings. Framing shall support all partition loads as indicated in Section 09 21 16 - Gypsum Board Assemblies.
  - 2. Door Frames for Overhead Door Openings: Channel sections; galvanized finish prepared for finish painting.
- B. Bollards: Steel pipe, concrete filled, steel crowned cap, as detailed; prime paint finish.
  - 1. Unless otherwise indicated on the Drawings, bollards shall be eight (8) inches diameter galvanized Schedule 40 steel pipe and shall be not less than 3'-6" exposed above finish grade.
  - 2. At bollards to be set in-ground and in ground floor slab, fill bollards with concrete and set a minimum of 3'-0" into the ground; round steel cap.
  - 3. At bollards designated as removable provide male/female type slip connections, set into slab minimum 6 inches for smooth transition; round steel cap.
    - a. DO NOT fill removable bollards with concrete.
- C. Pit Covers and Frames:
  - 1. Unless otherwise indicated on the Drawings, steel pit covers shall be 1/4" thick galvanized steel checkerplate. Frames shall be appropriately sized galvanized steel angles with suitable stops and anchoring devices.
- D. Loose Steel Lintels

1. Loose lintels shall be fabricated from A-36 steel from angles, shapes and masonry anchors of size and type scheduled for openings in masonry walls, unless otherwise indicated on the Drawings.
2. Provide not less than eight (8") inches bearing at each side of openings, unless otherwise indicated. Under no circumstances shall bearing (each end) be less than one (1") inch per foot of span.
3. Loose lintels, unless specifically otherwise noted, shall be installed with long legs vertical.
4. All exterior wall lintels shall be hot-dipped galvanized after fabrication and primed for finish paint. Back-to-back lintels shall have exposed seams continuously welded and ground smooth prior to galvanizing.
5. Lintels shall be required over all openings in masonry walls, including openings required for all other trades (i.e. mechanical and electrical equipment and ductwork, etc.), except where masonry lintels are otherwise scheduled or detailed.
6. Loose Steel Lintel Schedule (lintels are NOT to protrude beyond face of masonry):

Max. Masonry Openings	Wall Thickness
2' - 0" (& under)	4 Inch Walls 1L 3-1/2 x 3-1/2 x 1/4
3' - 0"	"
4' - 0"	1L 4 x 3-1/2 x 1/4"
5' - 0"	"
6' - 0"	1L 5 x 3-1/2 x 1/4"
	Wall Thickness
	4 Inch Walls
6' to 10'	1L 5 x 3-1/2 x 3/8
10' to 11'	1L 7 x 4 x 3/8
11' to 14'	1L 8 x 4 x 3/8

- F. Steel Ladders: Steel, in compliance with ANSI A14.3, with mounting brackets and attachments; prime paint finish.
1. Side Rails: 3/8 x 2 inches members spaced at 20 inches.
  2. Rungs: one inch diameter solid round bar spaced 12 inches on center.
  3. Space rungs 7 inches from wall surface.
  4. Applications: Elevator pit ladders. Coordinate ladder configuration and placement with elevator manufacturer.
- G. Light Pipe Battens:
1. Engineered and fabricated: 1.5" schedule 40 steel pipe, lengths as indicated on the drawings, and shall consist of pipe battens attached above and below the connector strip to the strip hanger brackets on a 4' x 4' grid matrix.
    - a. Field inspection to verify job conditions, dimensions and suitability of primary structure to receive channel framing.
    - b. Engineering of all battens, attachments between framing members, attachments between framing systems and building structure, and anchor points to receive attachments by the manufacturer of the building material or equivalent to be supported by the channel framing systems.
    - c. Submission of structural calculations including, but not limited to design criteria, stress and deflection analysis and selected framing, fittings and anchors prepared by a professional structural engineer licensed in the State of Maine.
  2. Batten splices shall be made as follows: An 18" long tube, 1-9/16" OD shall be inserted between two pipe battens at the splice. The two pipe battens shall be butt-welded and the weld ground smooth and filled. No splices are allowed within 6' of the end of a batten.

3. Suspend batten threaded rods as required by manufacturer engineer from sub-girt channel system. Do NOT attach suspension rods direct to metal decking above. Set length of suspension rods to set batten height at elevations indicated on the drawings.
4. Suspension Mounting Spacing: Provide suspension mounting as required by system engineer for loads required but in no case, less than 4 feet on center and 1 foot from ends. Provide grid stabilizers, clamps, turnbuckles, threaded rod suspension, fasteners and accessories as recommended by manufacturer.
  - a. Sub-girt System: See this Section; Slotted Channel Framing.
  - b. Escutcheon:
    - 1) Width: 2 inches.
    - 2) Shape: Round.
  - c. Maximum Load per Suspension Point: 500 lbs.
5. All pipe batten and accessories shall be painted flat black using a baked-on epoxy enamel or other suitable paint approved by the architect.
6. Products: (Basis of Design) Pipe Grids by iWeiss Theatrical Solutions.
  - a. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.05 PREFABRICATED LADDERS**

- A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
  1. Components: Manufacturer's standard rails, rungs, treads, handrails, returns, platforms and safety devices complying with the requirements of the Materials article of this Section.
  2. Materials: Aluminum; ASTM B221, 6063 alloy, T52 temper.
  3. Finish: Manufacturer's standard clear anodized coating, comply with AAMA 611, Class 1.
  4. Ladders: Engineer, manufacture and install ladders to support in excess of 300 pounds force concentrated live load.
  5. Ladder Safety Post: Retractable hand hold and tie off.
  6. Basis of Design:
    - a. Exterior Applications at Roof Locations: Model 502 by O'Keeffe's, Inc.
  7. Acceptable Manufacturers, pending specific product review:
    - a. FSI Industries.
    - b. Alaco Ladder Company.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Prefabricated Ship 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.
    - a. Maintain minimum 2 1/4 inches clear width between handrails and obstructions.
  2. Materials: Aluminum; ASTM B221 (ASTM B221M), 6063 alloy, T5 temper.
  3. Incline: 75 degrees.
  4. Finish: Mill finish aluminum.
  5. Basis of Design:
    - a. Interior Application (Roof Access 265): Model 523 by O'Keeffe's, Inc.
  6. Acceptable Manufacturers, pending specific product review:
    - a. FSI Industries.
    - b. Alaco Ladder Company.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.06 FINISHES - STEEL**

- A. Shop Priming:
  1. Applications: All steel items except as otherwise indicated. Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
  2. Preparation:

- a. Prepare exterior steel surfaces to be primed in accordance with SS PC-SP6 Commercial Blast Cleaning Standard.
  - b. Prepare interior steel to be primed and steel to be fireproofed in accordance with SS PC-SP3 Power Tool Cleaning Standard.
  - c. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
3. Product: One coat shop standard primer, 2 - 3 mils DFT.
- B. Galvanizing:
  1. Applications: All exterior steel unless indicated for additional finish.
  2. Galvanize steel members after fabrication to ASTM A123 requirements by a member of the American Galvanizers Association, Inc with a high grade, non-lead zinc bath.
  3. Smoothness: galvanizing shall a rugosity of 4 or less (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 micron increments.
  4. Warranty: Galvanizer's standard warranty that materials shall be free from 10% or more visible rust for 20 years.
  5. Where hot-dip galvanizing prior to completion of fabrication (cutting or welding operations) cannot be avoided, joints and cuts shall be finished with four (4) full coats of touch-up galvanizing repair paint as recommended by the fabricator.
  6. Prime galvanized metal within 24 hours of galvanizing, or sooner as recommended by finish paint manufacturer, to avoid oxidation.

## **2.07 FINISHES - ALUMINUM**

- A. Exterior Aluminum Surfaces: Class I natural anodized.
- B. Interior Aluminum Surfaces: Class II natural anodized.

## **2.08 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. Coordinate all work with the work of other trades.

### **3.02 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required. Re-prime after welding.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
- C. Shearing and punching shall leave clean true lines and surfaces. Weld or rivet permanent connections. Welds and flush rivets shall be finished flush and smooth on surfaces that will be exposed after installation. Welds shall be continuous unless otherwise noted. Welds shall not have voids or pockets and shall be ground to provide smooth transitions between metal surfaces. Do not use screws or bolts where they can be avoided; where used, heads shall be countersunk, screwed up tight and threads nicked to prevent loosening.



- D. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water. Provide holes and connections for the work of other trades.
- E. Connections and accessories shall be adequate to safely sustain, withstand stresses, strains, to which they will be normally subjected.
  - 1. Connections to steel unless otherwise specified shall be steel.
  - 2. Connections to genuine wrought iron work shall be wrought iron or steel.
  - 3. Connections to cast iron, unless otherwise specified shall be steel.
  - 4. Bolts, nuts, screws for exterior work shall be electrogalvanized, unless otherwise noted.
- F. Furnish all standard screws, bolts, washers, and other such fastening devices as are necessary for attaching this work to other materials. Anchors and other connecting devices required in concrete or masonry shall be built-in as the work progresses. NOTE: Special attention shall be given to the firm and secure anchoring of overhead mounted materials and equipment.
- G. Do cutting, punching, drilling, tapping required for attachment of other work coming in contact with miscellaneous metal where so indicated or where directions for same are given prior to or with review of shop drawings.
- H. Unless otherwise indicated, bolt, and screw heads shall be flat countersunk in exposed faces of ornamental or finished character; elsewhere as required. Cut off bolts, screws, etc., where exposed, flush with nuts, or other adjacent metal. Except as otherwise required, weld shop-assembled connections; welds, bolts, or machine screws may be used for field connections. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous. Exposed fastenings shall be the same materials, color, and finish as metal to which they apply, unless otherwise required.
- I. Make up threaded connections tightly so that threads will be entirely concealed by fittings.
- J. Allow for thermal movement resulting from a maximum temperature range change of 120 degrees F ambient and 180 degrees F surface by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and night time sky heat loss.

### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects. All work shall be designed for adjustment to field variation, fitted with proper joints and intersections, adequately anchored in place.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Perform field welding in accordance with AWS D1.1.
- D. Obtain approval prior to site cutting or making adjustments not scheduled.
- E. Work to be built in with masonry shall be of form required for anchorage, or be provided with suitable anchors, expansion shields, toggle bolts, etc. as required for proper anchorage. Fastening to wood plugs in masonry shall not be permitted.
- F. Install all supporting members, fastening, framing, hangers, bracing, brackets, straps, bolts, angles, and the like required to set, connect work rigidly and properly to structural steel, masonry, other construction.
- G. Ease all corners on steel installed, and exposed to view, that is located less than 10'-0" above finished floor. Provide consistent rounded corners.
- H. Setting bearing plates: Clean concrete and masonry bearing surfaces of bond reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates. Set bearing and leveling plates on wedges, shims or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if

protruding, cut off flush with edge of bearing plate before packing with grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

- I. Bollard Installation: Anchor bollards in concrete footings. Support and brace bollards in position in concrete footings until concrete has been placed and cured. Fill permanently installed bollards solidly with concrete, prepared for continuously welded steel cap.
- J. Removeable Bollards: Cast-in-place recessed female sleeves within structural concrete slabs as applicable. Provide a minimum 3/4 inch welded surface flange at sleeves set flush with top of finish concrete to receive edge of bollard above. Support and brace sleeves in position in concrete until concrete has been placed and cured.
  - 1. Provide welded concrete anchors, minimum two per sleeve.
  - 2. Coordinate placement of sleeves with under-slab radiant systems.
  - 3. Place removable bollards over internal sleeves with internal male connection. Bollard shall provide a minimum seat thickness of 1/4 inch sitting atop female receiver flange.
- K. Pit Frames: Fabricate frames and supports from structural steel shapes, plates and bars to sizes, shapes and profiles indicated and as necessary to receive gratings. Unless otherwise indicated, space anchors 24" o.c.
- L. Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint, and paint exposed areas with the same materials as used for shop painting, complying with SSPC-PA1. Apply by brush or spray to provide a minimum 2 mil dry film thickness. Clean field welds, bolted connections and abraded areas of galvanized surfaces to comply with ASTM A780.

#### **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**

**SECTION 05 51 00**  
**METAL STAIRS AND RAILINGS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Stairs with concrete filled treads.
- B. Guardrails and handrails.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.
- B. Section 04 20 00 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 12 00 - Structural Steel.
- D. Section 05 50 00 - Metal Fabrications: Prefabricated ladders and ship ladders.
- E. Section 09 90 00 - Painting and Coating: Field applied paint finish.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ASTM A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2012.
- C. ASTM A36 - Standard Specification for Carbon Structural Steel; 2008.
- D. ASTM A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2012.
- E. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2014.
- F. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- H. ASTM A1011 - 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; 2012a.
- I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- J. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.
- K. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
- L. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- M. AWS D1.1 - Structural Welding Code - Steel; American Welding Society; 2010.
- N. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc.; 2011.
- O. NAAMM AMP 510 - Metal Stairs Manual; The National Association of Architectural Metal Manufacturers; 1992, Fifth Edition.

- P. NAAMM MBG 531 - Metal Bar Grating Manual; The National Association of Architectural Metal Manufacturers; 2009.
- Q. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual; 2009 (ANSI/NAAMM MBG 532).
- R. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product data for all manufactured items.
- C. Shop Drawings: Submit stair, tube edging and railing shop drawings drawn at not less than 1/4" scale with components shown in related positions. It is expected that final design adjustments will be made as part of this submittal and review process and no claim for additional compensation will be accepted. Provide larger scale custom details. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Show all required field dimensions.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
  - 2. Include the design engineer's stamp or seal on each sheet of shop drawings.
  - 3. Indicate points of support and loads imposed on supporting structure.
  - 4. Shop drawings shall indicate all components, both custom fabricated and manufactured products.
- D. Submit structural analysis and certification sealed and signed by a qualified professional structural engineer, licensed in the State of Maine, that the stairs, and railings comply with the required structural design loads.
- E. Submit fabricator's certification that the stairs, and railings provided are in full compliance with the requirements of the Construction Documents and are totally suitable for the proposed installations when installed in accordance with the Shop Drawings.
- F. Submit evidence of the steel fabricator's in-plant special inspections program including: registration of special inspections program, written procedural and quality control manual and evidence of periodic auditing of fabrication practices by an approved inspection agency.
- G. Welders' Certificates.
- H. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

#### **1.05 QUALITY ASSURANCE**

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State of Maine, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.
- C. Fabricator Qualifications: Accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172) or a member of SSFNE, who participates in a recognized quality assurance program and who is regularly inspected by an independent testing/inspection agency.
  - 1. In the absence of the above requirements, the fabricator shall be required to hire and pay for an independent testing/inspection agency, approved by the Owner, to monitor fabrication and perform random testing of all stair and railing fabrication procedures, and to report to the Owner
- D. Manufacturers: Companies specializing in manufacturing products specified in this Section, with not less than ten (10) years of documented experience.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store and handle components in such a manner as to prevent damage to finished surfaces. Store components in a dry, clean location, away from uncured masonry and concrete.

**1.07 STRUCTURAL REQUIREMENTS**

- A. Structural Design: Provide complete stair, and railing assemblies complying with applicable codes.
- B. Stairs: Engineer, fabricate and install steel stairs in accordance with NAAMM Metal Stair Manual and to withstand the effects of gravity loads and the following structural loads without exceeding the allowable design working stress of the materials involved. Apply each load to produce the maximum stress in each component of steel stairs.
  - 1. Uniform Load: 100 lbf/sq.ft.
  - 2. Concentrated Load: 300 lb applied on an area of 4 sq. in.
  - 3. Uniform and concentrated loads need not be assumed to act concurrently.
  - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
  - 5. Limit total load deflection of treads, platforms and framing members to 1/360 of span or 1/4 inch, whichever is less.
  - 6. Limit live load deflection of treads, platforms and framing members to L/480.
  - 7. Stiffness: Design stairs that span more than 15 feet with no vibration. Limit Frequency to a minimum of 5 to 6 Hz.
- C. Handrail and Guardrail Assemblies: Comply with ASTM E 985, ASTM E894, and withstand the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each component.
  - 1. Handrails shall be rigid, free of vibration and able to withstand a concentrated force of 200 pounds applied at any point in any direction and, but not simultaneously, a uniform load of 50 pounds per foot applied in any direction.
  - 2. Top Guardrail member shall be rigid and able to withstand a concentrated force of 200 pounds applied at any point and in any direction and, but not simultaneously, a uniform load of 100 pounds per foot applied vertically downward to the top of the guard.
    - a. Infill areas of guardrails shall be rigid and able to withstand a horizontal concentrated force of 200 pounds applied on one square foot at any point in the system including panels, intermediate rails, balusters, or other elements. This loading condition shall not be applied simultaneously with the other loading conditions for guardrails.
    - b. Guardrail System shall withstand stresses resulting from railing system loads specified above.

**PART 2 PRODUCTS****2.01 METAL STAIRS - GENERAL**

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
  - 1. Handrails: Comply with applicable accessibility requirements of ADA Standards.
  - 2. Dimensions: As indicated on Drawings.
  - 3. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
  - 4. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
  - 5. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
  - 1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
    - a. Welded Joints: Continuously welded and ground smooth and flush.
    - b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.

- c. Exposed Edges and Corners: Eased to small uniform radius.
- d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.
- e. Applications: All Stairs; except Stair 4.
- 2. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit, or enclosed by walls, is considered exposed to view.
  - a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
  - b. Welds Exposed to View: Ground smooth and flush.
  - c. Mechanical Joints: Butted tight, flush, and hairline.
  - d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
  - e. Exposed Edges and Corners: Eased to small uniform radius.
  - f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.
  - g. Applications: Stair 4
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

## **2.02 METAL STAIRS WITH CONCRETE TREADS**

- A. Jointing and Finish Quality Level: Architectural and Commercial, as defined above.
- B. Type: straight
- C. Risers: Closed.
- D. Treads: Metal pan with field-installed concrete fill.
  - 1. Concrete Depth: 1-1/2 inches, minimum.
  - 2. Tread Pan Material: Steel sheet.
  - 3. Tread Pan Thickness: As required by design; 10 gage inch minimum.
  - 4. Pan Anchorage to Stringers: Continuously welded, from top or bottom.
  - 5. Concrete Reinforcement: Welded wire mesh.
  - 6. Concrete Finish: See Finish Schedule.
- E. Risers: Same material and thickness as tread pans.
  - 1. Riser/Nosing Profile: Sloped riser with rounded nosing of minimum radius.
  - 2. Nosing Depth: Not more than 1-1/2 inch overhang.
  - 3. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.
- F. Stringers: As detailed on the Drawings.
  - 1. Stringer Depth: As indicated on drawings.
  - 2. End Closure: Sheet steel of same thickness as risers welded across ends.
- G. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.
- H. Finish: Shop prime painted.
- I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

## **2.03 HANDRAILS AND GUARDRAILS**

- A. Steel Wall-Mounted Rails: Round pipe rails unless otherwise indicated.
  - 1. Outside Diameter: 1.66 inch. (actual)
  - 2. Finish: Interior primed.
- C. Guardrails:
  - 1. Steel Top Rails: Round pipe or tube rails unless otherwise indicated.



- a. Outside Diameter: 1.9 inch. (actual)
2. Intermediate Top Rails: Round pipe or tube rails unless otherwise indicated.
  - a. Outside Diameter: 1.66 inch. (actual)
3. Infill at Picket Railings: Vertical pickets.
  - a. Horizontal Spacing: Maximum 4 inches on center.
  - b. Material: Solid steel bar.
  - c. Shape: Square
  - d. Size: 1/2 inch square.
  - e. Top Mounting: Welded to underside of intermediate top rail.
  - f. Bottom Mounting: Welded to top surface of bottom rail.
4. Bottom Mounting: As indicated per the Drawings.
  - 1) Welded to top of stringer/perimeter opening steel tube.
5. Steel End and Intermediate Posts: Same material and size as top rails.
  - 1) Horizontal Spacing: As indicated on Drawings and as required for structural requirements.
  - 2) Mounting: Welded to top surface of stringer.

## 2.05 MATERIALS

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A500 or ASTM A501 structural tubing, round and shapes as indicated.
- C. Steel Plates: ASTM A6 or ASTM A283.
- D. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
  1. Hot-Rolled Steel Sheet: ASTM A1011, Designation CS (commercial steel).
  2. Cold-Rolled Steel Sheet: ASTM A1008, Designation CS (commercial steel).
- E. Concrete Fill: Type specified in Section 03 30 00.
- F. Concrete Reinforcement: Mesh type as detailed, galvanized.

## 2.06 ACCESSORIES

- A. Steel Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1.
- B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- C. Railing Fittings (Steel): Typical fittings shall include # 938 weld on caps, # 665 and # 1665 wall returns, # 386 and # 1386 brackets, by Julius Blum and Co. or equivalent.
- D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

## 2.07 SHOP FINISHING

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Tnemec 10-1009 Grey at 2-3 mils DFT.
  1. Preparation of Steel: Interior steel in accordance with SSPC-SP 3 Power Tool Cleaning Standard.
  2. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
  3. Product: One coat shop standard primer, 2 - 3 mils DFT.

## 2.08 RAILING FABRICATION - GENERAL

- A. In general, heights of handrails shall be 34 inches above nosings. Heights of guardrails shall be a minimum of 42 inches above finish floor, unless otherwise noted on the Drawings. Handrails shall be mounted to provide a minimum of 2-1/4 inch clear space to walls and other surfaces.

- B. Space intermediate balusters as indicated on the Drawings or as otherwise required to provide a maximum clear space between all members of less than four (4) inches. Space railing posts as indicated on the Drawings, and in accordance with railing engineering requirements.
- C. In general, handrails at stairs shall extend at least 12 inches beyond the top riser and at least 12 inches plus the width of one tread beyond the bottom riser. At the top, the handrail extension shall be parallel to the walking surface. At the bottom, the handrail shall continue to slope for a distance of the width of one tread from the bottom riser, with the remainder parallel to the walking surface.

## **2.09 FABRICATION - GENERAL**

- A. Fit and shop assemble components in largest practical sections, for delivery to site.
- B. Fabricate components with joints tightly fitted and secured.
- C. Stairs shall be fabricated such that the triangle formed between the tread, riser and bottom rail shall not allow a 4 inch sphere to pass.
- D. 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. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each configuration required. Maintain cylindrical cross section of pipe throughout the entire bend without buckling, twisting, cracking or otherwise deforming.
- F. Provide expansion joints in railings at intervals not to exceed forty (40) feet. Provide slip joints with internal sleeves extending two (2) inches beyond the joint on either side. Fasten the internal sleeve securely on one side only. Locate expansion joints within six (6) inches of posts.
- G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- H. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- I. Fabricate components accurately for anchorage to each other and to building structure.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify that rough opening and structural support are properly prepared prior to beginning installation.

### **3.02 PREPARATION**

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects.
- C. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- D. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- E. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.

- F. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- G. Obtain approval prior to site cutting or creating adjustments not scheduled.
- H. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- I. Where railings are to be set in concrete, railing posts shall be set in six (6) inch matching sleeves. Clean dust and foreign matter from sleeves and moisten interior of hole and surfaces with clean water. Pour fast setting cement into the annular space until it overflows the hole. Taper cement away from rails to promote proper drainage.
- J. Steel Stair Installation
  - 1. Set units accurately in location, alignment, and elevation, with edges and surfaces level, plumb and free of rack. Measure from established lines and levels.
  - 2. Install steel stairs by welding stair framing to steel structure or to weld plates cast into concrete and/or masonry except where otherwise indicated. Provide temporary bracing as required.
  - 3. Fit exposed connections accurately together to form hairline joints. Weld field connections of stairs.
  - 4. Set steel stair base plates at slabs on adjustable devices. After stairs have been positioned, tighten anchor bolts. Conceal the base plates in final installation. Use nonmetallic, non-shrink grout and pack grout solidly between bearing surfaces and plates to ensure no voids remain.
  - 5. Completed stair installation shall be rigid and free from vibration.

### **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

### **3.05 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements for general requirements for testing and inspections.
- B. General: Stair, landing and railing materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified testing agency. Such inspections and tests shall not relieve the Contractor of responsibility for providing his own inspections, quality control and materials and fabrication procedures in compliance with specified requirements. Any non-compliant materials or fabricated components shall be removed and replaced.
- C. The fabricator shall submit evidence of in-plant inspections in conformance with the International Building Code Structural Tests and Inspections - Inspection of Fabricators (1700).
- D. The fabricator's structural engineer shall inspect the stair installation, component type, size, spacing and placement for conformance with the approved stair system design and check member-to-member connections and connections to adjacent steel and concrete support elements, once during performance of the work and once after completion of the work.
- E. Testing and inspection shall be performed by the Owner's testing agency as identified in the Statement of Special Inspections.
- F. If Work is found not to conform to the Construction Documents, the Contractor shall be responsible for the cost of all further testing.
- G. The Contractor shall cooperate with and facilitate testing and field inspections. The Contractor shall, at his own expense, furnish the testing agency stair and railing shop drawings. Field bolted and welded connections shall be inspected.

**END OF SECTION**

**SECTION 06 10 54**  
**WOOD BLOCKING AND CURBING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Roof nailers, perimeter blocking and curbs.
- B. Blocking for wall and roof openings.
- C. Blocking for support of wall mounted items furnished by under the contract or by Owner, including, but not limited to: toilet and bath accessories, grab bars, railings, wall cabinets, wood trim, counters, door hardware, white boards, display boards, overhead door items, screens, shelving, projectors, miscellaneous equipment, and all other wall and ceiling mounted fixtures and equipment.
- D. Preservative treatment of wood and isolation strips to separate preservative treated wood from metal surfaces.
- E. Telephone and electrical panel boards, not specified as part of Division 26 - Electrical.

**1.02 REFERENCES**

- A. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. AWPA U1 - Use Category System: User Specification for Treated Wood; 2013.
- C. PS 1 - Structural Plywood, 2009.
- D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology; 2010.
- E. SPIB - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002 and supplements.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials.
- C. Certifications: Submit wood preservative treated manufacturer's certifications that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing and finishing treated materials.
  - 1. Submit verification of compliant moisture content for waterborne treated products.
  - 2. Submit warranties from chemical treatment manufacturers for each type of treatment.
- D. Submit dimension lumber certificates indicating compliance with minimum allowable unit stresses. Indicate species and grade selected for each used and design values approved by the American Lumber Standards Committee Board of Review.

**1.04 MOCK-UPS**

- A. Mock-Ups: Provide mock-ups of exterior framed wall, including components specified elsewhere, such as stud framing, gypsum wall sheathing, weather barrier, insulation, masonry veneer, window framing, and door framing.
  - 1. Mock-up panels shall demonstrate actual wall construction, detailing and workmanship. Finish materials shall be of the proper thickness, showing proposed color range, texture, bond, joints, and workmanship.
  - 2. No work shall progress until the Architect has reviewed the sample panels. Panels shall be revised as necessary to secure the Architect's acceptance. The panels shall then become the standard of comparison for all related exterior wall work.

**1.05 QUALITY ASSURANCE**

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
  - 1. Acceptable Lumber Inspection Agencies: Any agency with rules approved by American Lumber Standards Committee. Inspection agencies shall include: NLGA, SPIB, WCLIB, WWPA. Lumber shall be piece factory-marked with agency grade stamp.
  - 2. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Plywood: Comply with PS 1.
- C. Coordination with other Trades: Coordinate the locating of blocking, nailers, and similar supports for finish materials, millwork, casework, finish carpentry, equipment, hardware and accessories, regardless of whether such items are Owner or Contractor furnished, so that the installation of finish work may be properly executed in compliance with the intended design requirements. Before starting installation of supports, carefully check all related shop drawings and submittals; and indicate blocking requirements prior to submission to the Architect.

**PART 2 PRODUCTS****2.01 DIMENSION LUMBER**

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Miscellaneous Blocking, Furring, Nailers, and Curbs: Nominal sizes as indicated on the Drawings, S4S, kiln dried, S4S, No. 2 or Standard Grade.

**2.02 PLYWOOD PANELS**

- A. Miscellaneous Panels:
  - 1. Concealed Plywood: APA rated sheathing, PS-1, C-C Plugged or better, exterior grade, thickness as indicated.
  - 2. Electrical Component Mounting: APA rated sheathing, PS-1, C-C Plugged, not less than 15/32 inch thickness; painted with fire-retardant paint.

**2.03 ACCESSORIES**

- A. Fasteners and Anchors:
  - 1. Fastener Coatings:
    - a. Hot-dipped galvanized steel per ASTM A153 or AISI Type 304 stainless steel for exposed to weather or high humidity locations.
    - b. AISI Type 304 stainless steel at preservative treated wood locations, as appropriate to suit job conditions.
    - c. Hot-dipped galvanized nails per ASTM A653, Class G185.
  - 2. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Expansion anchors shall conform to Federal Specification FF-S325.
    - a. Anchors shall be capable of sustaining without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by ASTM E488.
    - b. Materials: Carbon-steel, zinc plated, ASTM B633, Class FE/Zn5, or Stainless-steel with bolts and nuts, ASTM F593 and ASTM F594, Alloy Group 1 or 2.
  - 3. Lag Screws and Lag Bolts: Shall conform to Federal Specification FF-B-561 and ASME B18.2.1.
  - 4. Power Driven Fasteners; Shall conform to National Evaluation Report NER-272.
  - 5. Nails and Staples: Shall conform to Federal Specification FS-N-105 and ASTM F1667.
  - 6. Bolts: Conform to Federal Specifications FF-B-571 and FF-B-575, ASTM A307, Grade A and ASTM A563 for hex nuts and flat washers.
  - 7. Ground Anchorage: Wood plugs or nailing blocks are not acceptable for fastening grounds, furring, etc. to concrete or masonry. Hardened steel nails, expansion screws,

toggle bolts, metal plugs, or metal inserts, as most appropriate for each type of masonry or concrete construction shall be used.

## **2.05 FACTORY WOOD TREATMENT**

- A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  - 1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
  - 2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.
- B. Fire Retardant Treatment, Interior Type A: AWWA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated, capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84 and with no evidence of significant combustion when test is extended for an additional 20 minutes.
  - 1. Kiln dry wood after treatment to a maximum moisture content of [15] percent for lumber and 15 percent for plywood.
  - 2. Provide fire-retardant treated wood products in the following locations:
    - a. Wood lumber and plywood indicated to be Fire-Retardant Treated (F.R.T.) or Fire Retardant (F.R.) on the Drawings.
  - 3. Do not use treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Pressure Treatment of Lumber Above Grade: AWWA U1, Use Category UC3B, Commodity Specification A. Each piece shall have an affixed quality mark to include identification of inspection agency, treatment standard, treating facility, preservative, retention and suitable end use.
  - 1. Kiln dry after treatment to maximum moisture content of 19 percent.
  - 2. Provide preservative pressure treated wood products in locations consistent with manufacturer's use recommendations. Locations as follows, not exposed to weather:
    - a. Wood in contact with masonry or concrete.
  - 3. Wood Preservatives:
    - a. CA-C - Copper Azole, Type C. (Min. 0.06 absorption).
    - b. ACQ - Alkaline Copper Quaternary. (Min. 0.25 absorption).
    - c. MCA - Micronized copper azole. (Min. 0.05 absorption).
    - d. PTI - Propiconazole-Tebuconazole-Imidacloprid. (Min. 0.018 absorption).
- D. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) or creosote.
- E. Isolation Strips: Self-adhering, polymer modified asphalt sheet, 40 mil thickness, with strippable release paper.
  - 1. Products:
    - a. Vycor V40 Tape.
    - b. Vycor Ice & Watershield.
    - c. Perm-A-Barrier Wall Membrane by W.R. Grace.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION - GENERAL**

- A. Examine and correct any conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected. Set members level and plumb, in correct position.



- B. Place horizontal members with crown side up.
- C. Construct curb members of single pieces.
- D. Space framing and furring members 16 inches o.c.
- E. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- F. Coordinate curb installation with installation of decking and support of deck openings.
- G. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- H. Cut out and discard all defects that will render a piece unable to serve its intended function. The Architect may reject lumber whether or not it has been installed, for excessive checking, warp, twist, bow, crook, mildew, fungus or mold as well as for improper cutting and fitting.
- I. Securely attach rough carpentry work to substrate by anchoring and fastening complying with CABO NER-272 for power-driven fasteners, and fastening schedules in the International Building Code, unless otherwise indicated.
- J. All preservative treated wood shall be separated from all aluminum and steel surfaces by use of flexible membrane isolation strips.

### **3.02 INSTALLATION OF PLYWOOD**

- A. Secure with long dimension perpendicular to framing members, with ends over firm bearing and staggered, using nails, screws, or staples.
- B. Materials shall be applied according to recommendations of the American Plywood Association.
- C. Install telephone and electrical panel back boards made of plywood or other acceptable structural panels at locations indicated. Size back boards to be minimum 48 inches beyond size of telephone and electrical panels.
- D. All preservative treated plywood shall be separated from all metal (coated and uncoated) by use of isolation strips.

### **3.03 INSTALLATION OF WOOD BLOCKING**

- A. Install all wood blocking as required to provide anchorage for other materials, fixtures, accessories, etc. Blocking shall be minimum 1-1/2" thick materials.
- B. Wedge, anchor and align blocking to provide a rigid and secure installation of both blocking and other work related thereto.
- C. All wall-mounted door hardware, restroom accessories, coat hooks, clothes rods, white boards, wall-mounted projectors, stair rails, interior signage, shelving, etc... attached to gypsum wallboard surfaces shall have blocking within the supporting wall.
- D. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build anchor bolts into masonry during installation of masonry work wherever possible. Secure anchor bolts to formwork before concrete placement wherever possible.
- E. All preservative treated wood blocking shall be separated from all metal (coated and uncoated) by use of isolation strips.

### **3.04 INSTALLATION OF ROOF BLOCKING**

- A. Roof blocking shall be installed in accordance with FM Loss Prevention Data 1-90. The following shall be considered the minimum requirements for anchoring roof blocking. Provide a minimum of two (2) anchors per length of each piece of blocking, and within six (6) inches of each end. The Contractor shall provide additional fasteners as needed to suit specific job conditions. Perimeter roof blocking shall be secured to decking, structural steel, spaced steel angles, or plates as described below unless indicated otherwise on the Drawings:
  - 1. Roof blocking parallel to metal decking ribs: Secure blocking to joists or beams with 3/8" diameter bolts at no more than 4'-0" oc. Where joist or beam spacing is greater than 4'-0",

bolt blocking to a continuous steel angle secured to the structure at maximum spacing of 4'-0" o.c. welded to the structure. As an alternative method, blocking may be secured to the deck with two rows of #10 stainless steel screws at twenty-four (24) inches o.c. with 5/8 inch diameter stainless steel washers.

2. Roof blocking perpendicular to metal decking ribs: Secure blocking to the deck with two rows of #10 stainless steel screws at twenty-four (24) inches o.c. with 5/8 inch diameter stainless steel washers.
  3. Roof blocking anchored to masonry: Secure blocking with 1/2 inch diameter bolts, spaced a maximum of four (4) feet o.c., staggered if the blocking is wider than six (6) inches. Within eight (8) feet of building corners, provide bolts at two (2) feet o.c. Bolts shall be embedded in grouted masonry cells a minimum depth of eight (8) inches.
  4. For nailing layers of blocking to each other, provide nails in two (2) rows, staggered with spacing not to exceed 12 inches o.c. within the row. Nails to secure blocking to other blocking shall be galvanized and shall be long enough to penetrate 1-1/4 inch minimum.
- B. Coordinate installation of roof blocking sequence with installation sequence of roof vapor retarder included in Section 07 53 00 – Elastomeric Membrane Roofing.
- C. Form blocking in conjunction with perimeter roof fascias, gravel stops and membrane roofs to shapes as detailed. Shim as required to continuously align flush with top of abutting roof insulation, including added thickness of tapered insulation, where applicable. Shim as required to maintain a constant top of fascia/gravel stop elevation, where applicable.
- D. All curbs and blocking related to skylights, roof hatches, mechanical equipment and other roof mounted accessories shall be installed level and plumb and shall not necessarily follow the pitch of the roof, unless specifically indicated on the Drawings.
- E. All preservative treated wood blocking shall be separated from all metals (coated and uncoated) surfaces by use of isolation strips.

### **3.05 SITE APPLIED WOOD TREATMENT**

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

**END OF SECTION**

**SECTION 06 20 00**  
**FINISH CARPENTRY & ARCHITECTURAL MILLWORK**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Custom woodwork items including but not limited to:
  - 1. Reception desks and related counters and transaction counters.
  - 2. Custom cabinet work and related counters, including but not limited to, cubbies, benches, locker enclosures, and display cases.
  - 3. Fixed and adjustable wall shelving.
  - 4. End panels and cleats for counters.
  - 5. Plastic laminate window sills.
  - 6. Other woodwork items, as indicated on the Drawings, and normally found under Section 06 41 00 Custom Millwork
- B. Shop finishing of wood items.
- C. Hardware and attachment accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 50 00 – Metal Fabrications: Part-Height Dowel Anchors.
- B. Section 06 10 54 - Wood Blocking and Curbing: Concealed wood blocking.
- C. Section 08 80 00 - Glazing: Glass and glazing built into millwork.
- D. Section 12 34 00 - Plastic Laminate Casework: Factory fabricated cabinet work.
- E. Section 12 36 00 - Countertops: Plastic laminate and solid surface countertops.

**1.03 REFERENCE STANDARDS**

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ANSI A208.2 - American National Standard for Medium Density Fiberboard; 2009.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. AWI/AWMAC/WI - Architectural Woodwork Standards; 2009.
- E. ANSI/BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.
- F. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2004.
- G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's technical information for all factory fabricated products, hardware, and accessories specified herein.
- C. Shop Drawings: Indicate materials, elevations, construction, clearances, component profiles, fastening methods, jointing details, finishes, hardware locations and accessories.
  - 1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot.
  - 2. Provide the information required by AWI/AWMAC/WI (AWS).
- D. Samples:

1. Submit confirmation samples and color chips for selected plastic laminate, solid surfacing, tack panel, retail display panels.
2. Submit wood trim samples minimum of 8 inches long, illustrating full range of grain, finish and color.
3. Submit wood veneer panel samples min 12"x 12" in size illustrating species, color and finish.
4. Submit hardware samples upon request of Architect.
5. Submit sample of cabinet construction upon request of Architect.

**1.06 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this Section with minimum five years of documented experience, with at least one project in the past 5 years with value of woodwork within 50 percent of cost of woodwork for this Project.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect woodwork and millwork during transit, delivery, storage and handling to prevent moisture and other damage, soiling and deterioration.
- B. Do not deliver woodwork and millwork until environmental conditions are suitable (enclosed, dry, with operating HVAC system), and painting and similar operations that could damage woodwork and millwork are complete.

**1.08 PROJECT CONDITIONS**

- A. Field Dimensions: The woodwork fabricator shall be responsible for coordinating the dimensions of all his work with actual field conditions, as well as with furniture, equipment and appliances to be furnished by others. The Contractor and fabricator shall cooperate to establish and maintain dimensions as required for a proper fit, without field modifications. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate measurements before being enclosed.
- B. Proper Fit: It shall be understood that dimensions on drawings are minimums, and actual field dimensions will result from Contractor coordination of other trades and adjacent system placements.

**1.09 FIELD CONDITIONS**

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

**PART 2 PRODUCTS****2.01 FINISH CARPENTRY & ARCHITECTURAL MILLWORK ITEMS**

- A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Custom Grade for plastic laminate faced items, and Premium Grade for hardwood items.
- B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.
  1. In general, finishes shall be Class C except Class B minimum shall be provided in exits, lobbies, corridors, and cafeteria.
- C. Bench Design Requirements: Uniform live load of 95 PSF and concentrated load of 150 lb on an area of 4 sq ft. Top surface shall be designed for maximum deflection of L/600.

**2.02 LUMBER MATERIALS**

- A. Hardwood Lumber (for transparent or stain finish): Select Maple species, Plain sawn, moisture content of 5 to 11%.
- B. Hardwood Lumber (for paint finish): Poplar species, Plain sawn, moisture content of 5 to 10 %. MDF is not acceptable for painted trim.

**2.03 SHEET MATERIALS**

- A. Plywood is defined as a panel manufactured with 3 or more layers (plys) of wood products composed of outer veneers or overlays and core materials laminated into a single sheet or panel.
  - 1. All plywood shall be manufactured in the United States or Canada.
  - 2. Cores shall comply with published industry standards for cores manufactured for use in architectural woodwork.
  - 3. Where a core is not specified, selection shall be at the option of the AWI woodworker.
- B. Hardwood Veneer Plywood: Face species select White maple, plain sawn, book matched, F.R.T. medium density fiberboard core, as indicated below.
- C. Panel Core: Medium density fiberboard (MDF); ANSI A208.2, class MD or MD-EXT as applicable, no urea formaldehyde-added, composed of wood chips, sawdust, or flakes of 47 pcf minimum density, made with water resistant adhesive; of grade to suit application; sanded faces.
  - 1. Applications: For plastic laminate facings, moisture resistant type at locations near or below sinks, window sills, and where otherwise indicated.
  - 2. Modulus of Elasticity: 405,000 psi minimum.
  - 3. Screw Holding Face: 250 lbs minimum.
  - 4. Screw Holding Edge: 225 lbs minimum.
- D. Panel Core: Particle board (PB), ANSI A208.1; Class M2; no urea formaldehyde-added, fire-resistive; composed of wood chips, sawdust, or flakes of 38.7 PCF minimum density, made with water resistant adhesive to suit application; sanded faces; thicknesses as required.
  - 1. Application: General use for plastic laminate facings.
  - 2. Panel Thickness: 3/4 inch unless otherwise indicated.
  - 3. Modulus of Elasticity: 290,100 PSI minimum.
  - 4. Screw Holding Face: 202 lbs. minimum.
  - 5. Screw Holding Edge: 180 lbs minimum.
- E. Panel Core: Fire-resistive Treated Particle board (PB), ANSI A208.1; Class M2; no urea formaldehyde-added, composed of wood chips, sawdust, or flakes of 38.7 pcf minimum density, made with water resistant adhesive to suit application; sanded faces; thicknesses as required.
  - 1. Applications: For plastic laminate facings for wall panels and casework located within corridors and egress area, and where indicated on the Drawings.
  - 2. Modulus of Elasticity: 290,100 psi minimum.
  - 3. Screw Holding Face: 202 lbs. minimum.
  - 4. Screw Holding Edge: 180 lbs minimum.
- F. Counter Substrate: Particle board; ANSI A208.1 Class M2; no urea formaldehyde-added.
  - 1. Application: Counters with no sinks.
  - 2. Density; 38.7 pcf min.
  - 3. Modulus of Elasticity: 290,100 psi minimum.
  - 4. Panel Thickness for Plastic Laminate Facing: 1-1/8 inches.
  - 5. Panel Thickness for Solid Surfacing: 3/4 inches minimum.
- G. Counter Substrate: Medium density fiberboard; ANSI A208.2; Grade 130; no urea formaldehyde-added; water resistant.
  - 1. Application: Counters with sinks.
  - 2. Density: 45 pcf min.
  - 3. Modulus of Elasticity: 405,000 psi minimum.
  - 4. Panel Thickness for Plastic Laminate Facing: 3/4 inches with built-up edges.
  - 5. Panel Thickness for Solid Surfacing: 3/4 inches minimum.
  - 6. Product: Medex by SierraPine.
- H. Melamine: Thermo-fused; NEMA LD 3, particle board core; surfaced both faced; color as selected from available options.
  - 1. Applications:

- a. Drawer boxes.
  - b. Semi-concealed cabinet interiors, as allowed, see Laminate Materials.
- I. Panel thicknesses shall be as follows, unless otherwise indicated on the Drawings:
  - 1. Cabinet Tops and Bottoms: 3/4"
  - 2. Cabinet Ends, Supports and Divider Panels: 3/4"
  - 3. Shelves: 3/4" up to 36" long and 1" over 36" long.
  - 4. Concealed Cabinet Backs: 3/8".
  - 5. Exposed Cabinet Backs: 3/4".
  - 6. Exposed Panels: 3/4".
  - 7. Doors and Drawer Fronts: 3/4".
  - 8. Tall Cabinet Doors: 1".
  - 9. Stiles, Rails and Trim: 3/4".
  - 10. Cabinet Valances: 3/4".
  - 11. Cabinet Aprons: 3/4".
  - 12. Drawer Backs and Bottoms: 1/2".
  - 13. Wall Panels: 3/4".

## 2.04 LAMINATE MATERIALS

- A. High Pressure Decorative Laminate (HPDL): NEMA LD 3; indicated as 'PLam' on the Drawings. All panels shall be faced both sides for balanced construction.
  - 1. Manufacturers and Colors: See Finish Legend.
  - 2. Horizontal Surfaces: HGL, 0.039 inch nominal thickness.
    - a. Applications: Exposed horizontal surfaces.
  - 3. Vertical Surfaces: VGS, 0.028 inch nominal thickness.
    - a. Applications: Exposed vertical surfaces and semi-concealed surfaces.
  - 4. Laminate Backer: BKL; 0.020 inch nominal thickness; undecorated plastic laminate.
    - a. Applications: Concealed faces for balanced construction.
- B. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

## 2.05 SOLID SURFACING

- A. Solid Surfacing: Homogenous filled acrylic, meeting ANSI Z124.3 and Z124.6, Type VI.
  - 1. Thickness: 1/2 inch.
  - 2. Joint Adhesive: Manufacturer's standard two-part adhesive to create inconspicuous, non-porous joints, with a chemical bond.
  - 3. Panel Adhesive: Manufacturer's recommended silicone.
  - 4. Support Substrate: Type as required for plastic laminate facing; 3/4 inch thickness or as indicated.
  - 5. Manufacturers and Colors: See Finish Legend.

## 2.06 TACK PANELS FOR MILLWORK (DISPLAY CASES)

- A. Tackable Wall Panel: Cork composition, 6 mm thickness; dense, fine grain, flame retardant.
  - 1. Roll Width: 1.22 m.
  - 2. Size: As required to cover surfaces with a minimum number of seams.
  - 3. Colors: As selected by Architect from manufacturer's full color line.
  - 4. Adhesive: Low VOC, as recommended by surfacing manufacturer.
  - 5. Product: Bulletin Board by Forbo.
  - 6. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.07 FASTENINGS AND ACCESSORIES

- A. Plastic Edge Banding for Plastic Laminate: Extruded or molded PVC or ABS, flat shaped with eased edges; smooth finish; of width to match component width. Banding thickness as follows:
  - 1. Edges at: Door fronts, drawer fronts, shelves, drawer boxes, end panels: 3 mm thickness.
  - 2. Edges at: Semi-exposed cabinet body behind doors or drawer fronts: 1 mm thickness.
  - 3. Color: As selected by Architect from manufacturer's standard range.



- 4. Products:
  - a. Accent Edge by Dolken Woodtape.
  - b. Edge Banding by Charter Industries.
  - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Adhesives: Suitable for the purpose; no urea formaldehyde or volatile organic compounds.
- C. Fasteners: Nails, screws and other anchoring devices of size, material, finish and type to suit application to provide secure attachment, concealed where possible; stainless steel or hot-dipped galvanized finish, complying with ASTM A153 in exposed locations of high humidity and at all exterior locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Sealants: Comply with requirements of Section 07 90 00 - Sealants.
- F. Lumber for Shimming, Cleats, Blocking, and Furring: Softwood or hardwood lumber, kiln dried to less than 15% moisture content.
- G. Decorative Glass: See Section 08 80 00.
- H. Joint Sealant: Mildew-resistant silicone sealant, clear.

## 2.08 HARDWARE

- A. Hardware: BHMA A156.9. Basis of Design products indicated. For substitutions see Section 01 60 00 - Product Requirements.
- B. Shelf Standards & Brackets: Heavy-duty; standards: 7/8" wide x 11/16" high x 14 gage cold rolled steel, single tracks, 2" slot spacing, back supported style, anochrome finish; bracket lengths as indicated on the Drawings. Provide one bracket at each shelf to standard location with #154 shelf fasteners for wood shelves.
  - 1. Product: 87 Standard and 186/187 Bracket by Knape & Vogt (KV).
- C. Shelf Support Pins: Standard side-mounted system using multiple holes for pin supports and coordinated shelf rests, anochrome finish, for nominal 1 inch spacing adjustments.
  - 1. Product: 345 by Knape & Vogt.
- D. Panel Support Clips: Interlocking metal Zee Clips. Total assembled clip thickness shall be 1/4".
- E. Coat Rods and Flanges: See Section 10 28 00 – Item 95.
- F. Coat Hooks: See Section 10 28 00 – Item 90B.
- G. Wiring Grommets: 2" outside diameter; plastic. Color selected from manufacturer's full range.
  - 1. Product: Series TG by Doug Mockett Co. Inc.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- H. Counter Support Brackets: Sizes as required for counter depth (8" to 29"). Spacing as indicated on the Drawings, but in no case greater than 36" apart.
  - 1. Finish: Powder coat finish. Color as selected from manufacturer's standard range.
  - 2. Product: EH-1800 Series by Rakks.
- I. Silencers: Use two per door and drawer.
  - 1. Product: Glynn Johnson GJ65.
- J. Hinges: Barrel type, steel with satin finish.
  - 1. Products: Aximat.
- K. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.
  - 1. Product: 4484 by Stanley.
- L. Drawer Slides: Telescoping on ball bearings; 100 pound, medium duty class; side mounted; integral stops; brushed zinc plated steel.
  - 1. Product: # 3834Grade 1HD-100 by Accuride.
- M. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
  - 1. Product: 0730 by Corbin Lock.
  - 2. Keying: Meet with Owner and Architect to review keying requirements.

- N. Floating Shelf: Painted wood composite shelf with extruded aluminum bracket. Capacity: 88 lbs. 12" deep units in widths indicated per the Drawings. Thickness: 1 inch. Hardware and accessories as recommended by the manufacturer for a complete system installation.
1. Product: Sumo Floating Shelf by Smart Furniture.

## **2.09 FABRICATION - GENERAL**

- A. The millwork details represented on the Drawings are not intended to indicate all of the framing, blocking and panel support required for the proper installation of millwork. It shall be the Contractor's responsibility to properly detail such work for lasting strength and stability, and to accurately represent it on shop drawings.
1. Note: There shall be no unfinished wood products. If not covered with plastic laminate products or otherwise finished, all wood surfaces shall receive a minimum of one coat of sealer in concealed or semi-concealed areas.
- B. In general, woodwork shall be assembled and installed using concealed fasteners, unless otherwise approved by the Architect. Fasteners shall be concealed, blind nailed, or countersunk with matching plugs. Secure woodwork to anchors or blocking built-in or directly attached to substrates.
- C. Joints in all work shall be tight and formed to conceal shrinkage. Running trim shall be in long lengths and joined only where solid fastenings can be made. End joints in built-up members shall be well distributed. Exterior corners shall be mitered, and interior corners and/or angles shall be coped. All edges shall be slightly eased; edges of solid wood members 3/4" thick or less to 1/16"; edges of rails and similar members more than 3/4" thick to 1/8".
- D. Complete fabrication in the shop, including assembly, finishing, and hardware application, to the maximum extent possible, before shipment to the site. Disassemble components only as necessary for shipment and installation. Pre-cut openings, where possible, to receive hardware, fixtures, electrical work and similar items.
- E. Fit exposed sheet material edges with edging as indicated on the Drawings. Use one piece for full length only.
- F. Condition woodwork to average prevailing humidity conditions in installation areas before installation. Install woodwork level, plumb, true and straight to a tolerance of 1/8" to 96 inches. Shim as required with concealed shims. Scribe and cut woodwork to fit, and refinish cut surfaces and repair damaged finish at plastic trim.
- G. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting. Closure panels/strips, end panels and trim shall be provided as required for a complete, finished installation.
- H. Shop prepare and identify components for book match grain matching during site erection. Provide continuous sequential use of veneer sheets from each flitch across each separate expanse of matched work.
- I. Tack surfaces shall be installed within woodwork as indicated on the Drawings, using adhesive, as recommended by the manufacturer. Provide miscellaneous anchors and trim as required.
- J. Solid Surfacing Fabrication Tolerances:
1. Variation in component size: 1/8".
  2. Location of openings: 1/8" from indicated location.

## **2.10 CABINET FABRICATION**

- A. Cabinet Style: Flush overlay.
- B. Cabinet Doors Fronts: Flush style.
- C. Drawer Construction Technique: Dovetail joints, fabricate for heavy duty use.
- D. Assembly: Construct cabinet bases separately from cabinets of pressure treated lumber. Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

- E. Edging: Fit shelves, doors, and all edges with specified edging. Exposed and semi-exposed edges do not use more than one piece for any single length.
- F. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- G. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
  - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
  - 2. Cap exposed plastic laminate finish edges with plastic trim.
- H. Note: There shall be no unfinished wood products. If not covered with plastic laminate products or otherwise finished, all wood surfaces shall receive a minimum of one coat of sealer in concealed or semi-concealed areas.
- I. Wall Cleats: Provide an interlocking wall cleat system at the top of wall cabinets. Interlocking cleats shall be  $\frac{3}{4}$ " x 2-1/2" with 45 degree cut. Cabinet mounted cleat shall be glued and doweled to cabinet ends and glued to top and back of cabinet. The bottom cabinet cleat shall be secured to the cabinet similarly to the upper interlocking cleat. See Installation paragraph, for wall cleat mounting requirements. An interior clear dimension of 12" shall be maintained for wall cabinets, unless indicated otherwise on the Drawings.
  - 1. All wall cleats shall be sealed.

## 2.11 COUNTER FABRICATION

- A. Fabricate in accordance with standards governing fabrication quality that are specified in herein. Field conditions shall be carefully measured prior to fabrication of countertops.
- B. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
  - 1. Join lengths of tops using self-leveling metal splines to draw sections together.
  - 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.
- C. Provide back and end splashes wherever counter edge abuts vertical surface unless otherwise indicated. Fabricate splashes 4 inches high, unless otherwise indicated. Splashes shall be fabricated loose, unless indicated to be integral with the counter surface.
- D. Plastic Laminate Countertops:
  - 1. Fabricate up to 10 feet long without joints. Fabricate up to 5 feet wide without joints.
  - 2. All edges shall be tooled smooth and square.
  - 3. Provide backer surfacing on non-exposed substrate surfaces for balanced construction.
  - 4. Where materials meet at edges and corners, joints shall butt and overlapping members shall be filed off smooth, forming a slightly eased joint.
  - 5. All joints shall be shop-prepared. No joint shall be located within 12 inches of a sink or 3 inches of a corner.

## 2.12 PLASTIC LAMINATES

- A. Plastic laminates shall be installed in strict accordance with the manufacturer's recommendations. All edges shall be tooled smooth and square. Any scratched or defaced materials shall be completely replaced at no additional cost to the Owner. Where materials meet at edges and corners, joints shall butt and overlapping members shall be filed off smooth, forming a slightly eased joint.
- B. Cap exposed plastic laminate finish edges with plastic banding, or as detailed on the Drawings.
- C. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.
- D. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

- H. Back prime woodwork items to be field painted, prior to installation.

### **2.13 WOOD TREATMENT**

- A. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; Class A, capable of providing flame spread index of 25 maximum for hardwoods and softwoods, fuel contributed index of 15 maximum for hardwoods and 25 maximum for softwoods, and smoke developed index of 0, maximum for hardwoods and 15 maximum for softwoods, when tested in accordance with ASTM E84
1. AWPAC U1; cured organic resin solution, relatively insoluble in water and shall not bleed through or otherwise adversely affect types of finishes indicated. Treatment shall permit milling of lumber after treatment and kiln drying by a plant certified by U.L. Maximum moisture content shall meet treatment manufacturer's standards.
  2. Provide fire retardant treated wood products in the following locations:
    - a. Where wood members (lumber and plywood) are indicated to be Fire-Retardant Treated (F.R.T.) or Fire Retardant (F.R.) on the Drawings.

### **2.14 SHOP FINISHING**

- A. Scope: It is intended that all millwork constructed of veneered and solid hardwood products shall be shop finished as specified herein.
- B. Comply with referenced quality standards for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork. Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood work. Apply 2 coats to back of panels and to end grain surfaces.
- C. Sand work smooth and set exposed nails and screws.
- D. Apply color matched wood filler in exposed nail and screw indentations.
- E. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- F. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for Grade specified and as follows:
1. Transparent: Conversion varnish (formerly TR-4).
    - a. Exposed Surfaces: Stain coat, sealer, and 2 topcoats.
    - b. Semi-exposed Surfaces: stain coat, sealer, and 1 topcoat.
    - c. Concealed Surfaces: 1 coat sealer.
    - d. Sheen: Medium Rubbed.
  2. Opaque: 3 coats alkyd paint system; sheen to be confirmed with the Architect. Colors as selected by the Architect.
- G. Field touchup after installation: Acrylic Lacquer.
- H. Back prime woodwork items to be field painted, prior to installation.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION AND PREPARATION**

- A. Verify adequacy of backing and support framing. Verify type of support framing for determination of proper fastener type. A minimum load of 60 pounds/LF for wall cabinets shall be supported. Provide a safety factor of 2.
- B. Verify location and sizes of utility rough-in associated with work of this Section.
- C. See Section 06 10 54 – Wood Blocking and Curbing, for installation of concealed wood blocking.
- D. Acclimate millwork items to temperature and relative humidity of the installation site for at least 24 hours prior to installation.

### **3.02 INSTALLATION**

- A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.

- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- D. Display wall panels: Condition panels for 72 hours in installation location prior to installation. Install panels in accordance with manufacturer's instructions. Hardware shall be straight, plumb and level. Anchor units rigidly and securely in place with appropriate fasteners into studs or concealed blocking.

### **3.03 CABINET INSTALLATION**

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level. Install to a tolerance of 1/8" in 8'-0" for plumb and level and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offsets in revealed adjoining surfaces.
- B. Wall Cleat System:
  - 1. Wall mounted portion of the interlocking cleat system shall be secured to continuous 2x6 wood blocking concealed within the partition that is anchored to studs. Fasten wall cleat with #12 pan head or wood screws, minimum 2-1/2" long, maximum 8" on center, or a minimum of 2 per cabinet. Pre-drill holes in cleats. Cleat shall be a continuous piece where multiple cabinets are installed in a row.
  - 2. Wall cleat securement to wall blocking shall be inspected and confirmed by the Owner prior to proceeding with wall cabinet installation.
  - 3. Secure cabinet by first interlocking the cleat system. Secure cabinet to wall cleat with #12 wood screws, minimum 2-1/2" long, minimum 2 per cabinet per cleat at top cleat and at bottom cleat, following industry best practices.
  - 4. Provide finished cabinet end panel if required to conceal end of wall cleat.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages. Scribe base toe-kick board to uneven floor surfaces.
- F. Install without distortion so that doors and drawers will fit openings properly and be accurately aligned.

### **3.04 COUNTERTOP INSTALLATION**

- A. Securely attach countertops to cabinets using concealed fasteners and with contact surfaces set in waterproof glue. Verify that cabinet top surfaces are level. Shim where required.
- B. Counter cleats shall be installed at walls where indicated and where required for counter support. Use moisture resistant MDF at counters with sinks.
- C. Plastic Laminate Countertops: Attach countertops using screws with minimum penetration into substrate board of 5/8 inch. Finish butt seams with matching sealant, as recommended by manufacturer.
- D. Loose plastic laminate and solid surface countertop back and side splashes shall be set in a continuous bead of silicone sealant at the countertop and at the wall. Provide a neat continuous bead of silicone at the joint between top of splash and vertical wall surface.

### **3.05 TOLERANCES**

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.
- C. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- D. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- E. Countertop Field Joints: 1/8 inch wide, maximum.

**3.05 CLEANING AND PROTECTION OF WORK**

- A. Erect and maintain temporary protective barriers until such time as permanent construction is in place and all danger of damage or defacement is past.
- B. Repair damaged and defective woodwork, where possible to eliminate functional and visual defects. Where not possible to repair, replace woodwork. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.

**3.06 ADJUSTING**

- A. Adjust moving or operating parts to function smoothly and correctly. Touch-up finishes to restore damaged or soiled areas.

**END OF SECTION**



**SECTION 07 11 13**  
**BITUMINOUS DAMPPROOFING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Bituminous dampproofing for the following applications:
  - 1. Structural steel columns and base plates in earth or concrete at the building perimeter.

**1.02 REFERENCE STANDARDS**

- A. ASTM D1187 - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 2011.
- B. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

**1.04 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 DAMPPROOFING PRODUCTS**

- 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. Composition - Vertical Application: ASTM D1227 Type III or ASTM D1187 Type I.
  - 2. Composition - Horizontal and Low-Slope Application: ASTM D1227 Type II or III.
  - 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. Sealastic Emulsion Type II (brush/spray-grade) by WR Meadows Inc.
    - b. 920-AF Fibered Emulsion Mastic (trowel grade) by Karnak.
    - c. 220-AF Fibered Emulsion Dampproofing (brush or spray grade) by Karnak.
    - d. HE780 by Henry
    - e. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify that items that penetrate 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. Do not apply over frost-covered surfaces.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.
- E. Use material as it comes in the container; thinning shall not be permitted.
- F. Do not apply dampproofing when temperature is below 40 degrees F.

### **3.03 APPLICATION**

- A. Prime surfaces in accordance with manufacturer's instructions.
- B. Apply bitumen with mop (brush).
- C. Apply dampproofing in one coat, continuous and uniform, at a rate of 3 pounds/sq ft per coat.
- D. Apply from 2 inches below finish grade elevation down to top of footings.
- E. Seal items projecting through dampproofing surface with mastic. Seal watertight.
- F. Coordinate installation so that dampproofing may serve as mastic for insulation, where applicable.
- G. Immediately backfill against dampproofing to protect from damage.

**END OF SECTION**

**SECTION 07 14 00**  
**FLUID-APPLIED WATERPROOFING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fluid applied membrane waterproofing and protection board at earth-covered face of passenger elevator pit walls.

**1.02 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.03 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacture of fluid-applied waterproofing membranes with fifteen years experience.
- B. Installer Qualifications: Company specializing in installation of fluid-applied waterproofing with minimum ten years experience.

**1.04 FIELD CONDITIONS**

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until cured.

**1.05 WARRANTY**

- A. See Section 01 78 10 - Warranties.
- B. All materials and workmanship related to sprayed-on applications shall be warranted, on a single document, by manufacturer and the licensed applicator for ten (10) years against defects and failures in products and installation.
- C. Repair and replacement: Such defective work, and other work damaged thereby which becomes defective during the warranty term, without extra cost to the Owner.

**PART 2 PRODUCTS****2.01 MEMBRANE AND FLASHING MATERIALS**

- A. Fluid-Applied Waterproofing (Sprayed-on): Polymer-enhanced, single component, black, elastomeric membrane for vertical surfaces only, suitable for installation over concrete substrates and green concrete without adverse effect on adhesion.
  - 1. Vertical Wet Film Thickness: 100 mils (Tremco) 80 mils (Henry) minimum.
  - 2. Solids Content: 60%
  - 3. VOC limits shall comply with South Coast Air Quality Management District (California).
  - 4. Application Temperature: minimum of 40 degrees F; down to 20 degrees F with approval of manufacturer.
  - 5. Adhesion, ASTM C794: Exceeds requirements.
  - 6. Water Vapor Permeability, ASTM E96: 0.1 perms maximum.
  - 7. Joint Treatment Mesh: Manufacturer's standard open weave glass fabric yarn saturated with synthetic resins.
  - 8. Products:

- a. Tremproof 260 by Tremco Sealants & Waterproofing Inc.
  - b. Aqua-Bloc WB by Henry Company.
  - c. Substitutes: See Section 01 60 00 - Product Requirements.
9. Protection / Drainage Board: Including manufacturer's related fasteners and accessories:
- a. Quick Set Panels (QSP) by Tremco.
  - b. DB 220 Series Drainage Board by Henry Company.
  - c. Substitutes: See Section 01 60 00 - Product Requirements.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
- C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.
- D. Verify that items that penetrate surfaces to receive waterproofing are securely installed.

#### **3.02 PREPARATION**

- A. Protect adjacent surfaces not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.
- C. Do not apply waterproofing to surfaces unacceptable to manufacturer.
- D. Fill voids, honeycomb, rock pockets, etc with non-shrink grout as recommended by the waterproofing manufacturer. Allow patching materials to cure. Repair and seal all cracks, non-moving control joints and penetrations per manufacturer's details and recommendations.

#### **3.03 INSTALLATION**

- A. Apply waterproofing in accordance with manufacturer's instructions to at least specified minimum thickness.
- B. Coating may be applied to damp or green concrete. Do not apply to frozen surfaces.
- C. Apply waterproofing by co-spraying or by two coat application with a tack coat applied horizontally, followed by the topcoat applied vertically.
- D. Apply extra thickness of waterproofing material at corners, intersections, and angles. Install fabric reinforcement at locations recommended by the manufacturer.
- E. Install drainage / protection board as recommended by the manufacturer, starting at the bottom of the wall with butt joints. Use fasteners as recommended by the manufacturer. Scribe and cut boards around projections, penetrations, and interruptions. All surfaces shall be fully covered as recommended by the manufacturer.

**END OF SECTION**

**SECTION 07 21 00  
THERMAL INSULATION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Rigid board insulation at cavity wall construction, perimeter foundation wall, underslab and exterior wall behind siding wall finish.
- B. Acoustic batt insulation in interior partitions.
- C. Thermal batt insulation at miscellaneous locations indicated per the Drawings.
- D. Firesafing insulation.
- E. Under-slab vapor retarder: Slab on grade areas not scheduled to receive underslab radiant systems.
- F. Foam insulation sealant for joints and small gaps.
- G. Adhesives, stick clips, tape, spring clips, etc.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: Installation of underslab vapor barrier and insulation boards.
- B. Section 07 21 19 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.
- C. Section 07 25 00 - Weather Barriers: Separate air, water and vapor barrier materials.
- D. Section 07 54 00 - Thermoplastic Membrane Roofing: Insulation specified as part of roofing system.
- E. Section 07 84 00 - Firestopping: Safing insulation as a component of firestopping assemblies.
- F. Section 09 21 16 - Gypsum Board Assemblies: Partitions for acoustic insulation.
- G. Division 23: Rigid Under-slab Insulation Board as a system component of under-slab heating systems.

**1.03 REFERENCE STANDARDS**

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.
- C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2014.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
- E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- F. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials; 2010.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Samples: Upon request, submit samples of each type of material to be used.

**1.05 MOCK-UPS**

- A. Mock-Ups: Provide insulation for exterior wall mock-ups specified in Section 04 20 00 and Section 07 42 13.
- B. Mock-up panels shall demonstrate actual wall construction, detailing and workmanship.
- C. No work shall progress until the Architect has reviewed mock-up panels. Panels shall be revised as necessary to secure the Architect's acceptance and shall then become the standard of comparison for all related exterior wall work.
- D. Mock-up panels shall not be destroyed or moved until the Work is complete and accepted by the Architect. Upon completion of construction, mock-ups shall be removed.

**1.06 FIELD CONDITIONS**

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

**1.07 PROTECTION, HANDLING AND STORAGE**

- A. Protect plastic insulation from exposure to sunlight, except as necessary for period of installation and concealment. Protect plastic insulation against ignition at all times. Do not deliver plastic insulation materials before installation time. Complete installation and concealment of plastic materials as quickly as possible.

**PART 2 PRODUCTS****2.01 APPLICATIONS**

- A. Rigid Under-slab Insulation Board: To be provided and installed under Mechanical Specifications. See Division 23 00 00. To be sealed under this Section.
- B. Rigid Perimeter Insulation Board at Foundations: Extruded polystyrene board.
- C. Rigid Insulation Board over Metal Stud Framed Walls with Sheathing, Continuous: High thermal resistive rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded on one side to a premium performance polymer bonded glass mat facer on both sides
- D. Rigid Cavity Wall Insulation Board: High thermal resistive rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded on one side to a premium performance polymer bonded glass mat facer on both sides
- E. Acoustic Glass Fiber Batt Insulation: For metal framed walls and above ceilings.
- F. Safing Insulation: Mineral fiber firestopping insulation.

**2.02 FOAM BOARD INSULATION MATERIALS**

- A. Extruded Polystyrene Board Insulation: ASTM C578, Type IV; Extruded polystyrene board with either natural skin or cut cell surfaces.
  - 1. Surface Burning Characteristics, ASTM E84: Flame Spread Index: 5 or less, Smoke Developed Index 145 or less.
  - 2. Board Size: 24 x 96 inch.
  - 3. Board Thickness:
    - a. Perimeter Foundation Walls: 2 layers of 1 inch, staggered joints, full height.
    - b. Slab Edge: 1 inch, continuous.
    - c. Other Locations: Thickness for specific conditions as indicated on the Drawings.
  - 4. Board Edges: Square.
  - 5. Thermal Resistance at 75 degrees F: 5.0 per inch.
  - 6. Compressive Resistance: 25 psi, unless otherwise specified.
    - a. Slab Edge: 60 psi.
  - 7. All joints and gaps between insulation board shall be sealed with foam sealant compatible with the insulation board
  - 8. Water Absorption, maximum: 0.1 percent, volume.



9. Products for Rigid Perimeter Insulation:
  - a. Styrofoam by Dow Chemical Co.
  - b. Foamular 250 by Owens Corning Corp.
10. Substitutions: See Section 01 60 00 - Product Requirements.
- B. High thermal resistive rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded to a premium performance polymer bonded glass mat facer on both sides.
  1. Application: Masonry veneer wall cavity and behind metal wall panel systems
  2. Type: ASTM C 1289, Type II, Class 2, Grade 3 (25psi compressive resistance)
  3. Panel size: 4ft x 8ft, and cut to meet project requirements
  4. Thickness / R Value: ASTM C 518 at 75 degrees F to be 4 inches = R25
  5. Water Absorption: ASTM C 209, less than 0.1 percent by volume.
  6. Resistance to Mold: ASTM D 3273 Passed (10)
  7. Board protective washers: Thermal Grip ci Prong Washers by Rodenhouse, Inc.
  8. Fasteners: Self-tapping, ceramic coated, Grip Deck ci Screws by Rodenhouse, Inc.
  9. All joints and gaps between insulation board shall be sealed with foam sealant compatible with the insulation board
  10. Products:
    - a. Hunter Panels Xci CG
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Underslab rigid insulation panels composed of high impact polystyrene foam.
  1. Application: Under radiant heat flooring areas
  2. Type: Compatible with 3/8", 1/2", 5/8", ViegaPex Barrier Tubing and 1/2" Viega FostaPex tubing. See Division 23 for tubing.
  3. Panel size: 4ft x 2ft, and cut to meet project requirements
  4. Thickness / R Value: ASTM C 518 at 75 degrees F to be 2 7/8 inches = R10
  5. Compressive Strength: 25 psi, 3600 psf
  9. All joints and gaps between insulation board shall be sealed with foam sealant compatible with the insulation board
  10. Products:
    - a. ProRadiant Rapid Grid by Viega
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.03 BATT INSULATION MATERIALS

- A. Glass Fiber Batt Insulation: (Acoustic) ASTM C665; flexible preformed batt or blanket, friction fit; minimum 25% recycled content.
  1. Surface Burning Characteristics, ASTM E84: Flame Spread Index 25 or less; Smoke Developed Index 450 or less.
  2. Formaldehyde Content: Zero.
  3. Thicknesses:
    - a. Partitions: 3 inches and 6 inches as required for full depth of partition stud sizes indicated.
    - b. Above ceilings: 6 inches, where detailed.
  4. Facing: Unfaced within stud walls. Poly wrapped above ceilings.
  5. Products:
    - a. Sound Shield Free by Johns Manville.
    - b. EcoBatt by Knauf.
    - c. ComfortTherm by Johns Manville. (poly wrapped)
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Mineral Fiber Batt Insulation: (Thermal) Flexible preformed batt or blanket, ASTM C665; friction fit, unfaced.
  1. Surface Burning Characteristics, ASTM E84: Flame spread index 0; Smoke developed index 0.

2. Thermal Resistance: R-value of 4 per inch.
  3. Products:
    - a. Thermafiber, Inc.
    - b. ComfortBatt by Roxul.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
  4. Where thickness is not indicated, furnish the maximum thickness appropriate for the proposed application.
- C. Fiber Firestopping Insulation (Safing Insulation): ASTM C665 Type 1, unfaced, high-melt mineral fiber batt and have the following properties:
1. Thickness: 2 inch minimum thickness, and as required by tested assemblies.
  2. Density, ASTM D1622: 4 pcf.
  3. Surface Burning Characteristics, ASTM E84: Flame Spread Index 15, Smoke Developed Index 0.
  4. Water Absorption, ASTM C 272: 0.1% by volume
  5. Accessories: Manufacturer's "Z" impaling clips as required.
  6. Products:
    - a. Thermafiber by USG.
    - b. Safing Insulation / MW by Owens Corning Insulation
    - c. For Curtainwalls: Foil-faced Thermafiber Curtainwall Insulation by USG.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.04 FOAM INSULATION SEALANT**

- A. Foam Insulation Sealant: Expanding, low VOC, HCFC-free, urethane foam sealant
1. Products:
    - a. Pur Fil IG 750 Foam by Todol Products, Inc.
    - b. Great-stuff Pro by Dow Chemical Co.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.05 ACCESSORIES**

- A. Fasteners, Impaling Clips with Retainers and Adhesive: To maintain insulation boards and batts in place as recommended by the insulation manufacturers and where applicable, as approved by Factory Mutual and related codes. In general, adhesives shall be "Construction Grade" and fasteners shall be corrosion resistant stainless steel or galvanized, as suitable for damp locations. Impaling clips with retainers shall be adhered or mechanically fastened to surfaces to receive insulation, length to suit insulation thickness and substrate, capable of securely holding insulation in place.

**2.06 UNDERSLAB VAPOR RETARDER**

- A. Underslab Vapor Retarder: Multi-ply, reinforced polyethylene, ASTM E1745, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.
  - 1. Applications: At all slab-on-grade locations not scheduled to receive under-slab radiant insulation panel systems.
  - 2. Water Vapor Permeance, ASTM E96: 0.03 perms max.
  - 3. Puncture Resistance, ASTM D1709: 475 min
  - 4. Tensile Strength, ASTM D882: 45 lbf/in min.
  - 5. Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations air-tight in vapor retarder.
  - 6. Special Attention: Coordinate installation and termination of underslab vapor retarder with the installation of rigid under-slab insulation Board, performing as both an insulator and vapor barrier. Seal vapor retarder to panels with tapes or other manufacturer approved methods compatible to both underslab vapor retarder and under-slab insulation board to provide a continuous vapor barrier.
- B. Products:
  - a. Griffolyn Type 65 by Reef Industries Co.
  - b. Moistop by Fortifiber Building Systems; 15mil minimum
  - c. Ply-Bar Plus II by Firstline Corp.
  - d. Stego Wrap Class C by Stego Industries; 15mil minimum
  - e. Husky Yellow Guard by Poly-America L.P.; 15mil minimum

**2.07 ACCESSORIES**

- A. Fasteners and Adhesive: As recommended by the insulation manufactures and as approved by Factory Mutual, material manufacturers, and related codes where applicable. In general, adhesives and fasteners shall be "Construction Grade", corrosion resistant stainless steel or galvanized, as suitable for damp locations.

**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. Exterior foundation wall perimeters shall have vertical rigid insulation installed from bottom of slab to top of footing. Coordinate with installation of sub-grade vapor barrier.
- B. Apply adhesive to back of boards in a pattern to ensure adhesion to the foundation, and to other boards.
- B. 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.
  - 4. Install boards in 2 layers with joints staggered.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

**3.03 BOARD INSTALLATION AT CAVITY WALLS AND BEHIND SIDING**

- A. Secure boards mechanically to studs with fasteners recommended by the manufacturer, and as specified

- B. At cavity walls, install boards to fit snugly between wall ties, without any gaps. Insulate to seal all gaps.
- C. Install boards horizontally on walls.
  - 1. Install in running bond pattern.
  - 2. Butt edges and ends tightly to adjacent boards and to protrusions, without any gaps. Insulate to seal all gaps.
- D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane, without any gaps. Insulate to seal all gaps.
- E. All joints and gaps between insulation boards shall be sealed with foam sealant compatible with the insulation board. Submit compatibility letters from each Board manufacturer and Weather Barrier manufacturer.
- F. Protect Boards to avoid damage from other trades, and construction materials during subsequent operations.
- G. Schedule work to ensure that Boards are covered as soon as possible after installation. Protect the installation from weather during subsequent operations. If the installation cannot be covered within 30 days after installation, apply temporary moisture and UV protection such as dark plastic sheet or tarpaulins.

#### **3.04 BOARD INSTALLATION UNDER CONCRETE SLABS**

- A. Provide continuous under slab rigid board insulation panels below slab areas scheduled to receive underslab radiant systems. Extend rigid insulation for a minimum width of four (4) feet beyond edge of scheduled heating perimeter. Set on top of the structural base fill for slabs.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane. Seal gaps and joints with foam insulation as recommended by rigid board manufacturer applicable to below slab installations.
- C. Board joints shall provide manufacturer standard tongue and groove edge placement. DO NOT use straight cut edges without prior approval of manufacturer indicating procedures for maintaining vapor barrier performance of systems.
- D. All joints, penetrations and/or other voids shall be taped and/or sealed. Provide supplemental underslab vapor retarder sheets as necessary. The intent of the panels is to perform as both a continuous insulator and vapor retarder system.
  - 1. At building perimeter edges: Seal board to vapor retarder sheet turning up and extending vapor retarder to edge of slab. Seal to foundation wall.
  - 2. At heating area perimeter: Extend board as indicated and coordinate tie-in of underslab vapor retarder sheet membrane. Seal tight.
- E. Prevent insulation from being displaced or damaged while placing vapor retarder and slab.
  - 1. NOTE: Under slab rigid insulation board installation shall be inspected prior to concrete pour and all penetrations, tears, disturbed areas, loose seams shall be repaired and re-inspected prior to commencement of concrete pour.

#### **3.05 UNDERSLAB VAPOR RETARDER INSTALLATION**

- A. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab. Vapor retarder shall be installed over areas not scheduled to receive under slab rigid insulation board as a component of the underslab radiant system with seams lapped 12 inches and taped continuously. All penetrations shall be taped continuously to achieve an air-tight installation. Edge of retarder shall be sealed against foundation wall and/or underslab rigid board systems as required.
  - 1. NOTE: Under slab vapor retarder installation shall be inspected prior to concrete pour and all penetrations, tears, disturbed areas, loose seams shall be repaired and re-inspected prior to commencement of concrete pour.

**3.06 FIBEROUS BATT AND BOARD INSTALLATION**

- A. Install fibrous board and batt insulation in accordance with manufacturer's instructions.
- B. Install thermal insulation at miscellaneous exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Install acoustic insulation between studs and other materials. Friction fit to prevent sliding and sagging. Provide clips and fasteners to maintain insulation in position at locations where insulation could fall out of the partition assembly (studs with gypsum board on one face only, for example) and other locations as required.
- D. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- E. Fit insulation completely to fill cavities and behind mechanical and electrical services within the plane of the insulation.
- F. All fibrous batt and board insulation shall be isolated from occupiable building spaces by gypsum board or other approved finish. Exposed insulation shall not be permitted in habitable areas.

**3.07 SAFING INSULATION**

- A. Install insulation as part of firestopping and smoke sealing in all floor/ceiling assembly penetrations, as required by fire sealant manufacturer's tested assemblies, as indicated on the Drawings, or as otherwise required for uninterrupted fire and smoke protection. Coordinate installation with Firestops and Smoke seals specified in Section 07 84 00 - Firestopping. NOTE: Unless specifically noted otherwise, firesafing insulation shall serve as back-up firestopping at penetrations. The primary firestopping shall be firestops as specified in Section 07 84 00 - Firestopping.
- B. Insulation shall be cut to fit snugly and neatly with the smooth face toward the visible side. Where small pieces are used to close holes or gaps, they shall be neatly packed into the opening to be filled, out of view. Provide concealed mechanical fasteners as required.

**3.08 FOAM INSULATION SEALANT INSTALLATION**

- A. Install foam insulation sealant continuously to completely fill all gaps and voids at insulation boards, at voids in deck flutes, at voids around window, door frames and other penetrations, and at locations as indicated on the Drawings.
- B. Install foam insulation following manufacturer's instructions and recommendations. Exercise caution not to overfill voids. Insulation shall be permitted to expand without causing the deflection of adjacent materials. Use non-expanding foam at perimeters of doors, windows and louvers.

**END OF SECTION**

**SECTION 07 25 00  
WEATHER BARRIERS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Weather Barrier System Type 1: Membrane, transition membrane and wall flashings for a complete system to perform as a combined continuous air, water and vapor barrier.
- B. Weather Barrier System Type 2: Membrane, transition membrane and wall flashings for a complete system to perform as a combined continuous air and water barrier that is vapor permeable.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 20 00 - Unit Masonry: Drip flashing installed in conjunction with weather barrier membrane flashing.
- B. Section 05 40 00 - Cold Formed Metal Framing: Sheathing substrate for weather barrier.
- C. Section 07 21 00 - Thermal Insulation: Rigid cavity wall insulation board.
- D. Section 07 53 00 - Elastomeric Membrane Roofing: Air-vapor barrier installed as part of the roofing system.
- E. Section 07 90 05 - Joint Sealers: Sealant materials and installation techniques.

**1.03 DEFINITIONS**

- A. Air Barrier: Air-tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
- B. Vapor Retarder: Air-tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
  - 1. Water Vapor Permeance: For purposes of conversion,  $57.2 \text{ ng}/(\text{Pa s sq m}) = 1 \text{ perm}$ .
- C. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture-resistant, to the degree specified, intended to send water to outside of the wall assembly.

**1.04 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- C. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.
- D. ICC-ES AC308 - Acceptance Criteria for Water-Resistive Barriers; ICC Evaluation Service, Inc.
- E. ICC-ES AC208 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; ICC Evaluation Service, Inc.; 2015.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions, terminations, flashings, penetrations, window and door openings and treatment of substrate joints and cracks.
- D. Manufacturer's Installation Instructions: Indicate preparation.
- E. Samples: Submit representative samples of sprayed coating, sheet seal, transition membrane, and membrane wall flashing.
- F. Certifications:



1. Submit certification by weather barrier manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
2. Submit weather barrier manufacturer's certification of compatibility of weather barrier with all materials in contact with it.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer: Weather barrier systems shall be manufactured and marketed by a firm with a minimum of 20 years of experience in the production and sales of waterproofing. Manufacturers proposed for use, but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past five years.
- B. Installer: A company with at least ten (10) years of experience with the installation of products specified herein and having successfully completed other Projects of similar scope, and approved by the weather barrier manufacturer.
  1. Written confirmation or certification from the Waterproofing Manufacturer that the installer has been trained and is recognized by the manufacturer as suitable for the execution of the work.
  2. List of at least three projects contracted within the past five years of similar scope and complexity to this Project carried out by the firm and the firm's site foreman.
- C. Materials Source Limitations: For each type of material required for the work of this Section, provide primary materials and weather barrier accessories that are the products of one manufacturer.

#### **1.07 PERFORMANCE REQUIREMENTS**

- A. General: Weather Barrier Type 1 shall be capable of performing as a continuous vapor barrier air and water resistive barrier and Type 2 shall be capable of performing as a continuous air and water resistive barrier, flashed to discharge to the exterior incidental condensation or water penetration. Weather barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to embedded flashing, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

#### **1.08 MOCK-UPS AND SAMPLE INSTALLATIONS**

- A. Mock-Ups: Provide weather barrier Type 1 system in exterior wall mocks as specified in Section 04 20 00 - Unit Masonry and Section 07 42 13 – Metal Wall Panels.
  1. Mock-up panels shall demonstrate actual wall construction, detailing and workmanship.
  2. No work shall progress until the Architect has reviewed mock-up panels. Panels shall be revised as necessary to secure the Architect's acceptance and shall then become the standard of comparison for all related exterior wall work.
  3. Mock-up panels shall not be destroyed or moved until the Work is complete and accepted by the Architect. Upon completion of construction, mock-ups panels shall be removed.
- B. Sample Installation: Prior to commencement of the complete installation of the weather barrier system, a sample installation shall be provided to verify details, tie-ins and to demonstrate the required quality of materials, installation and workmanship.
  1. The sample installation shall be applied to a constructed exterior wall section, 8 feet long and 8 feet wide, at a location to be determined by the Architect, incorporating brick shelf, window and door frame head, jamb and sill flashing and masonry ties.
  2. No work shall progress until the Architect has reviewed the sample installation. Sample installation shall be revised as necessary to secure the Architect's acceptance.

#### **1.09 PRE-INSTALLATION MEETING**

- A. Pre-Installation Conference: A pre-installation conference shall be held at least two weeks prior to commencement of field operations, and after the Contractor has approved and submitted the materials, to establish procedures to maintain optimum working conditions and to coordinate

this work with related and adjacent work. Agenda for meeting shall include but not be limited to the following:

1. Review of submittals.
  2. Review of surface preparation, minimum curing period and installation procedures.
  3. Review of special details and flashings.
  4. Sequence of construction, responsibilities and schedule for subsequent operations.
  5. Review of mock-up requirements.
  6. Review of inspection, testing, protection and repair procedures.
- B. Manufacturer's Representative: Make arrangements necessary to have a trained employee of the manufacturer on-site at the pre-installation conference, at initial installation, at 25% completion, at 50% completion, and final completion; as well as any other necessary re-inspections during membrane work to review installation procedures. A field inspection report, including photos and any necessary corrective action, shall be issued to the Contractor and Architect after each visit; indicating the quality of the work and identifying any issues and resolutions. No payment shall be due the Contractor until such field inspection reports are received, and all issues have been resolved.

#### **1.10 DELIVERY, STORAGE AND PROTECTION**

- A. Materials shall be delivered in manufacturer's original sealed containers clearly labeled with manufacturer's name, product identification, safety information, net weight, and expiration date.
- B. Materials shall be stored in a safe manner within temperature limits specified by the materials manufacturer.
- C. Avoid spillage. Immediately notify Owner and Architect if spillage occurs and start clean up procedures. Clean spills and leave area as it was prior to spill.
- D. Observe safety and environmental measures indicated in manufacturer's MSDS, and mandated by federal, state and local regulations.

#### **1.11 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

#### **1.12 WARRANTY**

- A. Provide the manufacturer's five-year materials warranty, covering the primary weather barrier, accessory sealant and membrane materials against failure to cure, or achieve airtight and watertight seal, or to adhere.

### **PART 2 PRODUCTS**

#### **2.01 WEATHER BARRIER MATERIALS**

- A. Weather Barrier Type 1 - Fluid-Applied Coating: Fire-resistant, liquid water drainage plane, air and vapor barrier system.
  1. Application: Unless specifically indicated as Weather Barrier Type 2 ALL weather barriers indicated shall be Type 1 as specified here-in.
  2. Wet Film Thickness: 70 to 80 mils.
  3. Dry Film Thickness: 38 to 43 mils.
  4. Application Temperature: 40 degrees F. minimum.
  5. Color: Un-cured medium blue; cured dark blue.
  6. VOC Content: <10 g/L
  7. Air Permeance, ASTM E2178: 0.0010 L/s sq m at 75 Pa.
  8. Water Vapor Permeance, ASTM E96A: 0.05 perms
  9. Products:
    - a. FR Barritech NP by Carlisle Coatings & Waterproofing, Inc.
    - b. Air-Bloc 32 MR by Henry.

- c. Substitutions: See Section 01 40 00 - Product Requirements.
- B. Weather Barrier Type 2 - Fluid-Applied Coating: Fire-resistant, air barrier, liquid water drainage plane and vapor permeable system.
  - 1. Wet Film Thickness: 70 mils.
  - 2. Dry Film Thickness: 30 mils.
  - 3. Application Temperature: 40 degrees F. minimum.
  - 4. Color: Un-cured medium blue; cured dark blue.
  - 5. VOC Content: <10 g/L
  - 6. Air Permeance, ASTM E2178: 0.02 L/s\* sq m at 75 Pa. (0.004 cfm/sq ft at 1.57 lbf/sq ft)
  - 7. Water Vapor Permeance, ASTM E96A: 10 perms min.
  - 8. Surface Burning Characteristics, ASTM E84: Flame Spread Index 25 max; Smoke Generated Index 450 max.
  - 9. Products:
    - a. FR Barritech VP by Carlisle Coatings & Waterproofing, Inc.
    - b. Air-Bloc 33 MR by Henry.
    - c. Substitutions: See Section 01 4- 60 00 - Product Requirements.
- C. Joint Filler: As recommended by coating manufacturer and suitable to the substrate.

## 2.02 SEALANTS

- A. Sealants: As recommended by the weather barrier system manufacturer for each application. Sealants shall have been tested for chemical and adhesive properties in relation to adjacent surface materials and approved in writing by the weather barrier system manufacturer. Confirm compatibility with the Foam Board Insulation manufacturer.
- B. Sealant Backers: As specified in Section 07 90 05.
- C. Primers, Cleaners, and Other Sealant Materials: Required, as recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.

## 2.03 ACCESSORIES

- A. Membrane Flashing: 40 mils total thickness; 32 mils self-adhesive rubberized asphalt integrally bonded to 8 mils cross-laminated high-density polyethylene film with disposable silicone-coated release paper.
  - 1. Permeance, ASTM E96: 0.05 perms.
  - 2. Puncture Resistance, ASTM D570: 40 lb, min.
  - 3. Products:
    - a. Blueskin TWF by Henry Company.
    - b. CCW-705 Self-Adhering Vapor/Air Barrier by Carlisle Coatings and Waterproofing.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Transition Membrane: 36 mils total thickness, 32 mils self-adhesive rubberized asphalt integrally bonded to 4 mil cross-laminated, high density polyethylene film with disposable silicone-coated release paper.
  - 1. Products:
    - a. Blueskin SA by Henry Company.
    - b. CCW-705 Self-Adhering Vapor/Air Barrier by Carlisle Coatings and Waterproofings.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Surface Conditioner / Primer: Required, as recommended by coating manufacturer and suitable to the substrate.
- D. Thinners and Cleaners: As recommended by material manufacturer.
- E. Drip Flashing: Membrane flashing termination at exterior of masonry veneer. See 04 20 00 - Unit Masonry.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that surfaces and conditions are ready to accept the work of this Section. Notify the Contractor, in writing, of circumstances detrimental to the proper completion of the Work. Do not proceed with work until unsatisfactory conditions are corrected.

**3.02 PREPARATION**

- A. Remove dust, dirt, oils, loose or foreign matter which might impair adhesion of materials.
- B. Masonry walls shall have mortar joints struck flush. All voids and holes, particularly in the mortar joints, shall be filled with lean mortar mix, non-shrink grout or parge coat.
- C. Exterior sheathing substrates shall be sufficiently stabilized with corners and edges fastened with appropriate fasteners. Pre-treat all board joints with 2 to 3 inch wide, reinforced self-adhesive tape or fiberglass mesh style wallboard tape. Gaps greater than 1/4 inch shall be filled with mastic or sealant, fully cured before application of tape and sprayed coating.
- D. Prime masonry or concrete substrate surfaces to receive adhesives and self-adhering membrane in accordance with manufacturer's instructions.

**3.03 INSTALLATION**

- A. Install materials in accordance with manufacturer's instructions.
- B. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.
- C. Fluid-Applied Coatings:
  - 1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
  - 2. Install sprayed coating over entire exterior surface; seal to adjacent construction with compatible sheet.
    - a. Spray with overlapping passes for a continuous uniform film thickness.
    - b. Carry coating into any openings a minimum of 2 inches.
    - c. Seal all penetrations as work progresses.
  - 3. Where exterior masonry veneer is to be installed, install masonry anchors before installing weather barrier over masonry; seal around anchors air tight.
  - 4. Use flashing to seal to adjacent construction and to bridge joints as recommended by system manufacturer. Provide backer rods to support membrane at joints to be bridged where required.
- D. Openings and Penetrations in Weather Barrier:
  - 1. Transition Membrane: After allowing the sprayed coating to cure to tack-free, apply transition membrane as indicated per the Drawings at door, storefront, curtainwall, louver and window framing perimeters, roof and floor intersections, other trade penetrations, and changes in substrate. Use pre-cut, easily handled lengths for each location.
  - 2. Membrane Flashing: Locate at heads of openings, items that bridge the cavity and other locations as indicated on the Drawings. Fully adhere flashing to substrate to prevent water from migrating under the flashing and seal top edge with termination mastic.
    - a. Remove release paper and position membrane flashing carefully before placing it against the surface. When properly positioned, place against surface by pressing firmly into place by hand roller. Overlap adjacent pieces 2 inches and roll all seams with a hand roller. Seal to edge of flashing with termination mastic.
    - b. Trim bottom edge 1/2 inch back from exposed face of the exterior wall. Flashing shall not be permanently exposed to sunlight. Flashing shall be adhered to top surface of metal flashing drip edge that shall project beyond face of exterior wall.
    - c. At heads, sills and all flashing terminations, turn up ends a minimum of 2 inches and make careful folds to form an end dam, with the seams sealed.

- d. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange. Provide flashing skirt at sill flange.
  - e. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
  - f. Do NOT allow the rubberized asphalt surface of the flashing membrane to come in contact with polysulfide sealants, creosote, uncured coat tar products or EPDM.
- 3. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.
  - 4. Treat construction joints and install flashing as recommended by manufacturer.

### **3.04 WASTE MANAGEMENT AND DISPOSAL**

- A. Separate and recycle waste materials in accordance with the waste disposal plan. See Section 01 74 19. Place materials defined as hazardous or toxic waste in designated containers. Ensure emptied containers are stored safely for disposal.

### **3.05 FIELD QUALITY CONTROL**

- A. Do not cover installed weather barriers until required inspections have been completed. In addition to manufacturer field inspections specified in this Section the Owner will provide air barrier commissioning at each interval of the manufacturer's field inspection and report. Receipt of the report will allow scheduling of the commissioning agent. Contractor shall provide 48-hour notice of the manufacturer's inspection. Failure to comply with this requirement will be resolved by the Contractor providing blower door tests to satisfy air barrier commissioning.
- B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- C. Contractor's Responsibilities: The Contractor shall appoint one individual who shall be responsible for achieving an acceptable, water and air barrier installation. This individual shall be on-site throughout the installation of the weather barrier and shall observe sealing of all penetrations, door, window, curtain wall, storefront, other openings, and sealing of weather barrier to roof air-vapor barrier to help ensure a proper installation.
- D. Weather barrier shall not be concealed until the installation has been accepted by the Owner and Architect.

### **3.06 PROTECTION AND CLEANING**

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.
- B. Remove any masking materials after installation. Clean any stains on materials that would be exposed in the completed work using procedures as recommended by the manufacturer.
- C. Protect membranes to avoid damage from other trades, and construction materials during subsequent operations.
- D. Schedule work to ensure that the weather barrier is covered as soon as possible after installation. Protect the installation from damage during subsequent operations. If the installation cannot be covered within 30 days after installation, apply temporary UV protection such as dark plastic sheet or tarpaulins.

**END OF SECTION**

**SECTION 07 42 13  
METAL WALL PANELS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Manufactured metal panels for walls, with related flashings and accessory components.
- C. Engineered cold formed steel sub-girt system for support of exterior metal wall panels, consisting of horizontal girts, stand-off brackets, associated fasteners and miscellaneous components required for a complete installation.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 40 00 - Cold-Formed Metal Framing: Exterior wall framing and sheathing.
- B. Section 07 21 00 - Thermal Insulation: Exterior wall cavity insulation.
- C. Section 07 25 00 - Weather Barriers.

**1.03 REFERENCE STANDARDS**

- A. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- B. ASTM A792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's product data sheets on panels, supports, accessories, finish, trims and sealants.
- C. Shop Drawings:
  - 1. Wall & Soffit Panels: Indicate panel and soffit dimensions, materials, gages, layout, joints, construction details, sealant locations, locations and types of fastening and anchorage.
  - 2. Exterior Sub-Girt System: Submit engineered shop drawings indicating girt system components, interface with building framing and wall panels, dimensions, locations and types of fasteners, anchorage, opening details, design loading, and accessories. All shop shall bear the seal of a licensed structural engineer employed by the wall panel subcontractor, licensed in Maine.
    - a. In conjunction with shops required here-in, submit a record copy statement by the structural engineer employed by the CFMF subcontractor per Section 05 40 00. Statement shall confirm structural calculations pertaining to the design requirements of the sub-girt system engineered per this Section have been received, and that the design of supporting CFMF systems meet the design requirements and applicable code as applicable.
- D. Structural Calculations:
  - 1. Submit girt framing system manufacturer's comprehensive analysis of design loads, including dead loads, live loads, wind loads and thermal movement, signed and sealed by a licensed engineer in Maine, employed by the wall panel subcontractor.
- E. Samples:
  - 1. Submit manufacturer's match sample, where specific colors are specified, 3" x 3" minimum size, for review by Architect.
  - 2. Submit samples of wall panels, full width by 10 inches minimum long, illustrating panel profile, finish color, sheen, and texture.
  - 3. Submit samples of girt system components.



4. Submit samples of all manufacturer trims, clips, fasteners (concealed and exposed) and accessories unless otherwise directed by Architect.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum fifteen years of documented experience.
- B. Designer Qualifications: Design girt system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Maine, employed by the wall panel subcontractor.
- C. Installer Qualifications: Company specializing in installing the products specified in this Section with minimum five years of documented experience and approved by the panel manufacturer.

#### **1.06 PRE-INSTALLATION MEETING**

- A. At least two weeks prior to start of installation of exterior wall insulation board and exterior siding attachment systems, meet at project site with panel manufacturer's technical employee representative, installers of the panels and installers of other adjacent work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.
- B. Review metal wall framing assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.

#### **1.07 MOCK-UP**

- A. Construct exterior wall mock-up, six feet long by eight feet wide on a suitable base with lateral support. Include panel system, girt system, window frame, weather barrier systems, insulation, stud wall, flashings and sealants to demonstrate component assembly and workmanship. See Mock-Up requirements as specified in Section 04 20 00.
- B. Make corrections to mock-up to achieve acceptance. Mock-up shall remain in place through the Work.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that may cause discoloration or staining of products.

#### **1.09 WARRANTY**

- A. See Section 01 78 00 - Project Close-out, for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's limited warranty covering degradation of metal wall panels and failure of factory-applied exterior finishes agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 30 year period from date of Substantial Completion.
- C. Installer's warranty of metal wall panel systems, including agreement to repair or replace wall panels that fail within specified warranty period of two years from date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Metal Wall Panels, vertical:
  1. Basis of Design: A-12 CF Series Panels (Concealed Fastener) by Morin (A Kingspan Group Company)
    - a. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 MANUFACTURED METAL PANELS**

- A. Metal Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
  - 1. Provide exterior panels and subgirt framing assembly.
  - 2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall. See Structural Drawings for design wind speed.
  - 3. Design Pressure: In accordance with applicable codes for Rockland, Maine.
  - 4. Maximum Allowable Deflection of Panel: 1/180 of span.
  - 5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
  - 6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
  - 7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
  - 8. Corners: Factory-fabricated in one continuous piece with minimum 18 inch returns. Mitered inside and outside corners fabricated by panel manufacturer.
  - 9. Exterior Finish: AAMA 621; Kynar 500 Fluoropolymer coating; film thickness of 0.80 mil over a 0.20 mil prime coat to provide a total dry film thickness of 1 mils.
    - a. Back of Panel Finish: Factory standard primer coating with a dry film thickness of 0.25 mil.
    - b. Finish shall conform to all Kynar 500 tests for adhesions, flexibility and longevity.
  - 10. Expansion Joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.
  - 11. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
  - 12. Panels shall be factory formed. Field formed panels are not acceptable.
- B. Exterior Panels:
  - 1. Profile: A-12 by Morin.
  - 2. Panel Joint: Tongue and groove interlock joint which are then mechanically attached through panel to supports using concealed fasteners.
    - a. Metal wall panels shall have factory-installed sealant at panel joints to provide a tight seal and minimize noise from movements within panel assembly.
  - 3. Material: Pre-coated aluminum sheet, 18 gauge, 0.0403 inch minimum thickness.
  - 4. Panel Width: 12 inches.
  - 5. Texture: Smooth.
  - 6. Height: 1 1/2 inch.
  - 7. Colors:
    - a. Panel 1 (Mfg Standard): Patina Green
    - b. Panel 2 (Mfg Standard): Bright Silver
    - c. Panel 3 (Mfg Premium): Copper Penny
    - d. Provide panels in colors specified where indicated per the Drawings.
- C. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- D. Anchors: Stainless steel.
- E. Pre-coated Aluminum Sheet: ASTM B209 3105 alloy, smooth surface texture; continuous, -coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- F. Trims and Caps: Manufacturer's standard type suitable for use with system, permanently resilient.
  - 1. Locations include, but are not limited to the following: Drips, sills, jambs, corners, framed openings, parapet caps, reveals and fillers.

- G. Sealants:
  - 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane. Proposed color shall be approved by the Architect.
  - 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
- H. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
- I. Field Touch-up Paint: As recommended by panel manufacturer.

### **2.03 SUBGIRT SYSTEM**

- A. Attachment system for exterior siding shall be capable of withstanding effects of load and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components. See Structural Drawings for project load requirements and wall panel wind pressure requires above.
  - 1. Furnish and install exterior continuous insulated wall assembly with no thermal bridges other than fastener to effectively control thermal, air and water performance. System shall include the following:
    - a. Cold-formed steel furring channel support and attachment framing system installed to exterior face plate of stand-off bracket, consisting of horizontal girts, stand-off brackets, associated fasteners and miscellaneous components required for a complete installation.
  - 2. Provide assemblies that allow for thermal movements, preventing buckling, opening of joints, overstressing of components and other detrimental effects:
  - 3. Design and install sub-girt system to accommodate primary structural frame deflection criteria as indicated per the Drawings.
  - 4. Maximum allowable deflection of span:  $L/180$ .
  - 5. Submit façade attachment/support framing system manufacturer's comprehensive analysis of design loads, including dead loads, live loads, wind loads and thermal movement, signed and sealed by a licensed engineer in the State of Maine.
  - 6. Furring channels, fasteners and accessories as required for a complete system and indicated per the Drawings.
  - 7. Product (Standoff): Stand-Off MPV Bracket by Exo-TEC Manufacturing Inc or equal.
    - a. Sizes (height):
      - 1) Locations: As indicated per the Drawings and as required by manufacturer's engineered system design submittals.
      - 2) 4 inches.
      - 3) 5 inches.
  - 8. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Inspect all panels. Notify manufacturer of panel defects, do not install defective panels,
- B. Verify that building framing members are ready to receive panels.
- C. Verify that weather barrier has been installed over substrate completely and correctly.

### **3.02 SUB-GIRT SYSTEM INSTALLATION**

- A. Preparation: Verify girt spacing, stand-off layout and framing clearances relative to studs or other points of attachment in accordance with manufacturer engineering.
- B. Install according to manufacturer's recommendations and engineering requirements.
  - 1. Mount stand-off brackets, at spacing as determined by engineering calculations overtop of installed weather barrier as indicated by engineering. Coordinate installation with wall cavity rigid insulation per Section 07 21 00.
  - 2. Mount horizontal girts, fastened at spacing as determined by engineering calculations overtop of installed stand-off bracket plate as indicated by engineering.

- 3. Check plumb of girts both parallel and perpendicular to the structure.
- C. Install subgirts perpendicular to panel width, securely fastened to substrates and shimmed and leveled to uniform plane. Space at intervals indicated on the engineered shop drawings.

### **3.03 PANEL INSTALLATION**

- A. Install panels in accordance with manufacturer's instructions.
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- C. Install panels plumb, level, and true-to-line to dimensions and layout indicated on approved shop drawings.
- D. Fasten panels to structural supports.
- E. Locate joints over supports.
- F. Use concealed fasteners unless otherwise approved by Architect.

### **3.04 TOLERANCES**

- A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

### **3.05 CLEANING**

- A. Remove site cuttings from finish surfaces.
- B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

**END OF SECTION**

**SECTION 07 53 00**  
**ELASTOMERIC MEMBRANE ROOFING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Mechanically fastened elastomeric membrane roofing system at new roofs.
- B. Insulation, flat and tapered, roof vapor retarder, cover boards, membrane flashings, cant strips, stack boots, walkway pads, splash blocks and other roofing related materials.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 74 19 - Construction Waste Management.
- B. Section 05 12 00 - Structural Steel: Roof mounted steel dunnage for support of HVAC equipment and duct supports.
- C. Section 05 51 00 - Metal Stairs and Railings: Roof mounted ladders and railings.
- D. Section 06 10 54 - Wood Blocking and Curbing: Wood blocking, nailers and curbs.
- E. Section 07 62 00 - Sheet Metal Flashing and Trim: Metalwork fascias, copings, flashings.
- F. Section 08 62 23 - Tubular Skylights.
- G. Division 22 - Plumbing: Roof drains.
- H. Division 23 - HVAC: Mechanical equipment penetrating the roofing.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.
- B. ASTM C1396 - Standard Specification for Gypsum Board; 2011.
- C. ASTM D4637 - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2012.
- D. ASTM D 4811 - Standard Specification for Non-vulcanized (Uncured) Rubber Sheet Used as Roof Flashing; 2013.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- F. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials; 2010.
- G. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.
- H. NRCA - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; current edition with updates.
- I. UL - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.
- J. UL - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with installation of associated counter-flashings installed under other Sections.
- B. Pre-installation Meeting: After submission of submittals, and prior to review of roofing and flashing shop drawings, samples and printed data, convene a pre-installation meeting.
  - 1. The meeting shall include, but not be limited to the following items for discussion:
    - a. Preparation and installation procedures.
    - b. Coordination and scheduling necessary for related work.
    - c. Roof access, staging and storage areas.
    - d. Establish working weather conditions.
    - e. Roofing protection provisions, and other relevant issues.
  - 2. The following personnel shall be present:

- a. Contractor (Project Manager, Superintendent)
  - b. Roofing Sub-Contractor (Project Manager, Foreman)
  - c. Roofing and Flashing Materials Manufacturers' Technical Employees
  - d. Mechanical Sub-Contractor (Project Manager, Foreman)
  - e. Architect.
3. Verify compatibility of all materials in contact with roofing, including but not limited to:
- a. Treated and Kiln-dry lumber.
  - b. Sealants and adhesives.
  - c. Insulations and roofing boards.
  - d. Vapor Retarders.
  - e. Sheathing.
  - f. Walkway pads.
  - g. All other roofing materials.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners. Submit specimen warranty.
- C. Shop Drawings: Provide roof details and roof layout plan.
  1. Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and walkway pad.
  2. Indicate areas, slopes and thicknesses of tapered insulation on roof layout plan. Key-in details on roof layout plan.
  3. Indicate roof mounted equipment, dunnage, duct supports, railings, skylights, etc.
  4. Indicate thickness and dimensions of all parts, fastening and anchoring methods, details and locations of seams, joints, and provisions necessary for thermal expansion and contraction. Key in details on roof layout plan.
  5. Indicate details of roof flashing including jointing, expansion joints, intersections with walls, terminations, transitions from cants to walls, transitions from curbs, fascia details, and any other details required for a complete watertight installation. Key in details on roof layout plan.
- D. Samples: Submit samples illustrating insulation, roofing membrane, metal flashing, fasteners and cover board.
- E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- F. Manufacturer's Certificate: Certify that all products, including insulation, underlayment and related fasteners are satisfactory for their intended applications.
  1. Submit final shop drawings to the roofing manufacturer for review as required by warranty requirements.
- G. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- I. Pre-Installation Notice: Submit a copy of the roofing manufacturer's required Pre-Installation Notice indicating acceptance and approval by the roofing manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum twenty years of documented experience.



- C. Applicator Qualifications: Company specializing in performing the work of this Section with minimum ten years experience and approved by the manufacturer.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.
- D. Materials being stored on a roof surface shall not overload the deck or structural assembly.
- E. Lids shall be secured on cans of stored materials and all emulsions, coatings, adhesives, solvents, sealants, foams, etc. shall be stored at temperatures as recommended by the manufacturers.

#### **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 stated temperature range.
- 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.

#### **1.09 WARRANTY**

- A. See Section 01 78 10 - Warranties.
- B. Applicator/Contractor Warranty: The roofing and flashing subcontractor hereby guarantees that roofing, roof insulation, roof accessories, flashings and roof metalwork will be free from defective materials and workmanship for a period of two (2) years from the date of Substantial Completion. Upon notification of any such defects within said guarantee period the roofing and flashing subcontractor shall promptly make all necessary repairs and replacements at no cost or expense to the Owner. This warranty shall be signed and countersigned by the installer (Roofer) and the Contractor.
- C. Manufacturer's System and Membrane Warranties: Upon completion of the membrane roofing system work, the roofing materials manufacturer shall furnish the Owner a "Total System" / "Red Shield" warranty covering membrane, insulation, roof metalwork, and membrane accessories, insuring a watertight roof for a period of twenty (20) years. The warranty shall cover repairing leaks due to ordinary wear and tear of the elements, manufacturing defects and defective workmanship, wind damage up to 80 mph, over the twenty (20) year period; no dollar limitation for liability.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. EPDM Membrane Materials:
  - 1. (Basis of Design) RubberGard Reinforced MAX EPDM Membrane by Firestone Building Products Co.
  - 2. Sure-Seal EPDM by Carlisle SynTec.
  - 3. JM EPDM by Johns Manville.
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation: Manufacturer as recommended by the roofing system manufacturer.

#### **2.02 ROOFING**

- A. Elastomeric Membrane Roofing:
  - 1. One ply membrane, mechanically fastened, over insulation and vapor retarder.

- B. Roofing Assembly Requirements:
  - 1. Roof-Ceiling Fire Resistance Rating: 1 hour fire rated roof assembly conforming to UL Assembly Design No. P732. Refer to Section 07 81 00 – Applied Fireproofing for protected metal deck areas.
  - 2. U.L. Class A Fire Hazard Classification.
  - 3. Provide roofing system attachment capable of withstanding uplift pressures as determined by ASCE-7, using 100 MPH Basic Wind Speed, Exposure C.
    - a. See Structural Drawings.
- C. Acceptable Insulation Types - Constant Thickness Application:
  - 1. Construction: Minimum 2 layers of 3 inch thickness polyisocyanurate board mechanically attached to roof metal deck.
- D. Acceptable Insulation Types - Tapered Application: Tapered polyisocyanurate board, for 1/4" per foot minimum roof pitch.

### 2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); internally reinforced with fabric; complying with minimum properties of ASTM D 4637, Type II. Class SR.
  - 1. Thickness: 0.060 inch.
  - 2. Colors: Black.
  - 3. Ultimate Elongation, ASTM D412: 250 percent.
  - 4. Tearing Strength, ASTM D751: 81 lbf.
  - 5. Breaking Strength, ASTM D751: 265 lbf.
  - 6. Water Absorption, ASTM D471: 2.94 +/- percent increase in weight.
  - 7. Water Vapor Permeability, ASTM E96: 2.0 perms.
  - 8. Brittleness Temperature, ASTM D2137: -65 deg F.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Roof Vapor Retarder: Reinforced 3 ply laminated, fire-retardant sheet. Provide manufacturer's recommended tape for seams.
  - 1. Fire Resistance, ASTM E84: Class A, Flame spread 5, Smoke developed 75.
  - 2. Permeance, ASTM E96: <1.0 perm.
  - 3. Tensile Strength, ASTM D882: 145 lb-ft.
  - 4. Products:
    - a. Griffolyn Type TX-1200 FR by Reef Industries Inc.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Flexible Flashing Material: Self-curing, non-reinforced membrane composed of nonvulcanized EPDM rubber, complying with ASTM D4811 Type II, 0.055 inch thickness, color same as membrane.
- E. Protective Neoprene Overlayment: Manufacturer's standard for protection of membrane at kitchen exhaust hoods locations.

### 2.04 COVER BOARDS

- A. High Density Polyisocyanurate Cover Board: Non-combustible, water resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D1623.
  - 1. Applications: Where indicated per the Drawings.
  - 2. Thickness: 0.5 inch.
  - 3. R-Value, ASTM C158 and C177: 2.5.
  - 4. Surface Water Absorption, ASTM C209: <3%, maximum.
  - 5. Compressive Strength, ASTM D1621: 120psi.
  - 6. Density, ASTM D1622: 5pcf.
  - 7. Product: As recommended by roofing system manufacturer.

### 2.05 INSULATION

- A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type II, Class 1, polymer bonded glass fiber mat both faces and with the following characteristics:

1. Compressive Strength, ASTM D1621: 20 psi
2. Tapered Board: Slope as indicated; 1/4 inch per foot minimum slope; fabricate of fewest layers possible.
3. Total Minimum Insulation Thickness: Six (6) inches, made up in 2 layers of three (3) inch boards, minimum.
4. Long-term Thermal Resistance: R-value of 5.7 per inch min.
5. Board Edges: Square.
6. Products: As recommended by the roofing system manufacturer.
  - a. Basis of Design: ISO 95+ GL by Firestone Building Products

## **2.07 ACCESSORIES**

- A. Stack Boots: Prefabricated flexible boot, with metal umbrella flashing and collar for pipe stacks through membrane; same material as membrane.
- B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
- C. Membrane Adhesives: As recommended by membrane manufacturer.
- D. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- E. Termination Bars: Roofing manufacturer's standard; with detailed cap flashing.
- F. Sealants: One-part urethane as recommended by roofing membrane manufacturer.
- G. Walkway Pads: EPDM, 0.30 inch thickness, 30" x 30" adhered to membrane, suitable for maintenance traffic, visually distinctive from roof membrane.
  1. Applications: From all roof access points to all roof mounted equipment requiring service. Each piece of equipment shall have walkway pads installed around the entire unit.
  2. Composition: Molded rubber, slip resistant.
- H. Pre-cast Concrete Splash Blocks: Precast 4,000 psi concrete units; 4,000 psi air entrained mix; smooth finish; 24" x 24" x 2" in size. Locate at all scupper outfalls and where indicated on the Drawings.

## **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 cant strips are in place.
- F. Ensure that wood nailers are installed at the perimeter of each roof level, curb, and all roof penetrations as recommended by the membrane manufacturer. Nailers shall be firmly anchored to resist forces of not less than those prescribed by applicable codes and regulations. See Section 06 10 54 - Wood Blocking and Curbing, for additional information. The thickness of the nailers shall be such that the top of the nailer is flush with the surface to which the membrane is attached at the horizontal plane, except at roof perimeters which shall be as indicated on the Drawings.
- G. Inspect the substrates scheduled to receive the roofing and flashing systems. Notify the Contractor of any and all defects in the substrates and do not proceed with the work until such defects have been satisfactorily corrected. Before beginning the Work, a representative of the membrane manufacturer shall examine the roof surfaces in order to ensure that they are acceptable for application.

**3.02 VAPOR RETARDER, INSULATION AND COVERBOARD**

- A. Apply roof 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: Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
- D. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
- E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- F. Lay roof insulation in courses parallel to roof edges. Stagger joints from existing insulation by 6" minimum in all directions. Fill all surface voids in the immediate substrate that are greater than 1/4 inch wide with fill material acceptable insulation to membrane manufacturer.
- G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- H. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 24 inches.
- I. Do not apply more insulation than can be covered with membrane in same day.
- J. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch. Fill gaps greater than 1/4 inch with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch .
- K. Mechanical Fastening: Using specified fasteners and insulation plates engage fasteners through coverboard and insulation into deck to depth and in pattern required by ASCE 7 loading, deck substrate requirements, FM and membrane manufacturer, whichever is more stringent.
  - 1. Attach top layer of polyisocyanurate board at a rate of 12 fasteners per 4'x8' board in the field, perimeter and corner areas, minimum.

**3.03 MEMBRANE APPLICATION**

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Mechanically Fastened Application: Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions and approved shop drawings.
- D. Overlap edges and ends and seal seams by installing primer and splice tape, minimum 6 inches wide. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. At intersections with vertical surfaces:
  - 1. Extend membrane as required by manufacturer up a minimum of 8 inches onto vertical surfaces.
  - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
  - 3. Provide securement strips and fasten with seam fastening plates at locations where recommended by the membrane manufacturer.
- F. At fascias, extend membrane under fascia metalwork and to the outside face of the wall.
- G. Test areas where roofing membrane products lap and bond to or under weather barrier products shall be made and allowed to weather for a few days to confirm satisfactory bonding and adhesion.
- H. Around roof penetrations, seal flanges and flashings with flexible flashing.

- I. Coordinate installation of roof drains and sumps and related flashings.
- J. Coordinate installation of associated metalwork flashings installed under other Sections.
- K. Install protective neoprene overlayment at least 24" beyond area of kitchen hood exhaust.

### **3.04 FLASHING AND ACCESSORIES INSTALLATION**

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the Drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane. See Section 07 62 00.
  - 1. Follow roofing manufacturer's instructions.
  - 2. Remove protective plastic surface film immediately before installation.
  - 3. Install water block sealant under the membrane anchorage leg.
  - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
  - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
  - 6. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- C. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer.
- D. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weather-tight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface.
  - 1. Use the longest practical flashing pieces.
  - 2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
  - 3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
  - 4. Provide termination directly to the vertical substrate as shown on roof drawings.
- E. Roof Drains:
  - 1. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed manufacturer's recommendations.
  - 2. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch of membrane to extend inside clamping ring past drain bolts.
  - 3. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
  - 4. Apply sealant on top of drain bowl where clamping ring seats below the membrane
  - 5. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.
- F. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
  - 1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
  - 2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches deep, with at least 1 inch clearance from penetration, sloped to shed water.
  - 3. Structural Steel Tubing: If corner radii are greater than 1/4 inch and longest side of tube

does not exceed 12 inches, flash as for pipes; otherwise, provide a standard curb with flashing.

4. Flexible and Moving Penetrations: Provide weather-tight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

### **3.05 WALKWAY PADS INSTALLATIONS**

- A. Install walkway pads in accordance with manufacturer's instructions at access points to roof, around rooftop equipment and where indicated on the Drawings. Adhere to the roofing membrane and space 1 to 3 inches apart.
  1. If installation of walkway pads over field fabricated splices or within 6 inches of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches on either side. Prime membrane prior to adhesion.

### **3.06 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.
- B. System Manufacturer's Inspection: Inspection(s) shall be made by a technical representative of the system manufacturer to ascertain that the roofing system has been installed in accordance with the system manufacturer's published specifications and details.
  1. At a minimum, the technical representative of the system manufacturer shall attend the pre-roofing conference, inspect the work at initial installation, 50% completion and 90% completion; prior to final inspection for warranty.
  2. The purpose of these inspections is to determine whether a system warranty will be issued by the system manufacturer. Should the technical representative find that the roofing system has not been installed in a manner that qualifies for issuance of the specified system warranty, the system shall not be acceptable to the Owner until the installer has made corrections or repairs, the system has been re-inspected by the system manufacturer's technical representative and the specified roofing system warranty has been issued.
2. Submit a copy of all inspection reports and follow-up reports to the Architect.

### **3.07 CLEANING**

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

### **3.08 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**



**SECTION 07 62 00**  
**SHEET METAL FLASHING AND TRIM**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings and miscellaneous brackmetal.
- B. Manufactured metal fascias, reglets and accessories.
- C. Roofing metalwork as part of a total roofing system warranty.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Blocking and Curbing: PT wood blocking for metal flashings.
- B. Section 07 53 00 - Elastomeric Membrane Roofing: Membrane roofing system requiring metalwork for Total System warranty.
- C. Section 07 42 13 - Metal Siding: Color matching of flashing.
- D. Section 07 72 00 - Roof Accessories: Roof-mounted accessories.

**1.03 REFERENCE STANDARDS**

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2010.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- D. SMACNA - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Convene at least three weeks before starting work of this Section in conjunction with roofing pre-installation meeting. See Sections 07 53 00.
- B. Pre-installation Meeting shall take place after submittals have been sent to Architect for review. Submittals will be returned after the meeting with comments from the meeting included.
- C. Roof system manufacturer representative shall be present at the Pre-installation Meeting.

**1.05 PERFORMANCE REQUIREMENTS**

- A. General: Install flashings that are watertight; will not permit the passage of liquid water; and will withstand wind loads, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

**1.06 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit product data for manufactured items including materials, finish, fastening methods, configurations and integration with adjacent materials.
- C. Shop Drawings:
  - 1. Roof: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details. Key into roof plan shop drawing, see Section 07 53 00 - Elastomeric Membrane Roofing.
  - 2. Indicate shapes, sizes, finishes and gauges of all wall flashings and at other locations.
- D. Samples:
  - 1. Submit samples each 4x4 inch in size, illustrating metal materials, thickness, and colors.

2. Submit samples 8" long in size, illustrating roofing fascia system.

### **1.07 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with ten years of documented experience.

### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

### **1.09 WARRANTY**

- A. The flashing and roofing subcontractor hereby guarantees that roof metalwork, flashings, roofing, roof insulation and roof accessories will be free from defective materials and workmanship for a period of two (2) years from the date of Substantial Completion. Upon notification of any such defects within said guarantee period the roofing and flashing subcontractor shall promptly make all necessary repairs and replacements at no cost or expense to the Owner. This warranty shall be signed and countersigned by the installer (Roofer) and the Contractor.
- B. Metal Flashings Warranty under Roofing Manufacturer's Total System Warranty: See Section 07 53 00 - Elastomeric Membrane Roofing.
- C. Pre-finished Aluminum: Finish shall be warranted against premature failure for twenty (20) years.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Roofing Fascia System: ASTM B209, pre-finish aluminum fascia with continuous anchor bar/cleat.
  1. Product: As approved by the selected roofing system manufacturer for a Total System Warranty. Basis of Design: AnchorGard Roof Edge System by Firestone or equal.
  2. Thickness: 0.040 inch fascia and continuous cleat.
- B. Aluminum: ASTM B209; thickness as indicated; smooth finish, factory finished coating, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; Kynar or Duranar by PPG.
  1. Color: Custom color selection as directed and approved by Architect to match selected Metal Wall Panels specified under Section 07 42 13 and masonry veneers under Section 04 20 00. Base bid to include a minimum of (4) four custom colors in varying quantities:
    - a. One color to match the Copper Penny metal wall panel
    - b. One color to match the "dark grey" ground face masonry.
    - c. One color to match the "blue" brake metal roof edges
    - d. One color to match the Patina Green metal wall panel
  2. For Total System Warranty projects, metalwork shall be as approved by the membrane roofing manufacturer.
- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Sealant: Type silicone, specified in Section 07 90 05.
- E. Plastic Cement: ASTM D4586, Type I.
- F. Fasteners for Aluminum: Stainless steel ring nails; 12 gage with 1/4" diameter, flat head, annular threaded, needle point, length as required to obtain 1-1/4" embedment into blocking/framing and full depth into plywood.

**2.03 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.. Form on a bending brake. Perform shaping, trimming, and hand seaming in the shop to the maximum extent possible.
- 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. Form metal with full regard for expansion and contraction to avoid buckling or other deformation in service. All lines and rises shall be straight and crisp except where thickness of metal dictates radius bend.
- E. Pre-fabricate corners with joints locked, riveted and where indicated from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- H. Unless indicated otherwise, provide expansion joints at 24 feet on centers maximum and at 2 feet from all changes in flashing direction (each side) and from all terminations of flashing.
- I. Prefabricate corner pieces and end dams with locked and riveted joints, soldered watertight at copper flashing and sealed at aluminum flashing.
- J. Provide backer plates as required at through-wall flashing transitions and corners, make fully watertight. Backer plates shall be continuous to cover gaps to be overlain by membrane flashing at all deck and column to wall transitions. Secure to framing or plywood at 6" centers and within 1/2" of corners and edges.
- K. Fabricate flashings to allow toe to extend minimum 2 inches over vertical roofing terminations. Return and brake edges.

**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. Seal top of reglets with sealant. See Drawings, for 2 piece reglet flashings at masonry walls and other locations indicated.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

**3.03 GENERAL REQUIREMENTS FOR METAL FLASHING**

- A. Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather, without failing. Fabricate and install flashings and roof edges to fully comply with the recommendations of Factory Mutual (FM) Loss Prevention Data Sheet 1-90 for the applicable wind zone.
- B. Schedule and coordinate sheet metal installations with the work of other trades where it is integral or continuous therewith. Materials furnished under this Section that are to be built-in by other trades shall be delivered to the site in sufficient time to avoid delays to construction progress. Instruct other trades concerning the location and placement of reglets, wood nailers, and cleats.

- C. Surfaces to which roofing and sheet metal are to be applied shall be even, smooth, sound, thoroughly clean and dry and free from projecting nail heads or other defects that would affect the application. Report in writing any unsatisfactory surfaces to the Contractor.
- D. Where flashing abuts or members into adjacent dissimilar metals, the juncture shall be executed in a manner that will facilitate drainage and thus minimize the possibility of galvanic action. Note: All metalwork shall be isolated from contact with pressure treated wood products, using roofing membrane, felts, or approved coatings.
- E. All accessories or other items essential to the completeness of the sheet metal installation, though not specifically shown or specified, shall be provided. All such items, unless otherwise indicated on Drawings or specified, shall be of the same kind of material as the item to which applied and the gauges shall conform to recognized industry standards of sheet metal practice.
- F. Provide expansion joints in sheet metal work at intervals not greater than forty (40') feet. Expansion joints shall be fabricated in accordance with the recommendations of the Architectural Sheet Metal Manual (SMACNA) and as specified herein.
  - 1. Begin expansion joint construction by setting an 8" wide cleat. Lap ends of metal work over base sheet, leaving 1/2" clear space between butt ends. Set ends in full bed of sealant. Cover entire joint assembly with a 4 inch wide metal cover, finish to match other metal work and secured allowing for movement.
- G. Fabricate and install sheet metal with lines, arises, and angles sharp and true and plane surfaces free from objectionable wave, warp, or buckle. Exposed edges of sheet metal shall be folded back to form a 1/2" wide hem on the side concealed from water leakage under all weather conditions. The workmanship and methods employed for framing, anchoring, cleating, and the expansion and contraction of sheet metal work shall conform to applicable details and description as indicated in current edition of the following publications unless other methods are indicated on project Drawings or specified herein.
  - 1. Architectural Sheet Metal Manual as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc., and hereinafter referred to as "The SMACNA Manual".
- H. All ferrous metal work shall be zinc coated and finished as specified elsewhere herein. Touch-up all field cuts and minor scratches with approved zinc rich primer and finish coat to match adjacent finishes.
- I. All metal work terminating on roofing shall be provided with flanges for nailing. Wood nailers shall be provided beneath flanges and roofing for nailing of the metal flanges.
- J. Provide cleats, edge and drip strips where sheet metal extends over edges and where necessary to secure sheet metal work at fascias, and elsewhere. Form edge strips in lengths of 8' or 10'. The ends shall be butted together, leaving approximately 1/4" space for expansion. Secure to building construction with fasteners spaced not over 12" on centers. Install strips in continuous, long lengths to allow metal work to be hooked over lower edge at least 1/2".
- K. Flash intersections of roofs with vertical surfaces as detailed and indicated on the Drawings, or otherwise required to provide watertight construction and to suit job conditions.
- L. Seams shall always be made in direction of flow.
- M. Fabricated fascias shall be sized and shaped to profiles indicated, using sheets 8' to 10' long. Lower edge shall hook a minimum of 1/2" over previously placed continuous edge cleats.

### 3.04 INSTALLATION

- A. Conform to Drawing details, SMACNA Architectural Sheet Metal Manual recommendations and National Roofing Association Manual recommendations.
- B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.

**3.05 INSTALLATION OF TOTAL SYSTEM ROOFING METALWORK**

- A. Confirm that roofing membrane shall extend over face of perimeter blocking and weather barrier transition membrane for wall / eave construction.
- B. Set anchor cleat in a continuous bead of sealant and secure with recommended fasteners.
- C. At end joints and corners of anchor cleat, install manufacturer's rubber splice material to maintain a continuous seal providing a watertight edge.
- D. Install fascia on the anchor cleat in accordance with manufacturer's recommendations.

**3.06 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.
- C. See Section 07 53 00 - Elastomeric Membrane Roofing, for field inspection requirements.

**3.07 SCHEDULE FOR FABRICATED METALWORK**

- A. Cleats: Aluminum, 0.050 inch.
- B. Scuppers: Aluminum, 0.060 inch.
- C. Diverters: Aluminum: 0.060 inch.
- D. Base Flashing: Aluminum: 0.040 inch.
- E. Coping, Cap, Parapet, Sill and Ledge Flashings, Cornice Covers: Aluminum, 0.040 inch.
- F. Sill Flashing at Windows, Aluminum: 0.032 inch; hem exposed edge.
- G. Vertical Termination Strips: 0.028 inch.
- H. Miscellaneous Flashings: Aluminum: 0.040 inch or as required, unless otherwise indicated on Drawings.

**3.08 CLEANING AND PROTECTION**

- A. Clean all metalwork to remove all fingerprints, oils, etc.
- B. Remove from roof surfaces all scraps and metal debris immediately. Extreme care shall be exercised to prevent sharp metal scraps or waste nails from coming into contact with membrane materials.

**END OF SECTION**

**SECTION 07 72 00  
ROOF ACCESSORIES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Roof hatches and hatch guards.
- B. Fall protection rooftop guards.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 53 00 - Elastomeric Membrane Roofing.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1910.23 - Guarding floor and wall openings and holes; current edition.
- B. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process ; 2013.
- C. ASTM A792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process ; 2010.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used and installation instructions.
- C. Shop Drawings: Submit shop drawings indicating type, configuration, and dimensions of all materials. Shop drawings shall indicate fastening and anchoring methods, flashing, details, and locations of all seams, joints, and other provisions necessary for thermal expansion and condensation control.
  - 1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings.
  - 2. Subit layout shop drawings for snow guards.
- D. Warranty Documentation:
  - 1. Submit manufacturer warranty.
  - 2. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

**1.06 WARRANTY**

- A. See Section 01 78 00 - Project Close-out, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

**PART 2 PRODUCTS****2.01 ROOF HATCHES, MANUAL AND AUTOMATIC OPERATION**

- A. Manufacturers - Roof Hatches (Basis of Design): Bilco Co.
  - 1. Alternate Manufacturers:
    - a. Babcock-Davis



- b. Milcor by Commercial Products Group of Hart & Cooley, Inc.
  - c. Nystrom Products Inc.
  - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Roof Hatches, General: Factory-assembled steel frame and cover, complete with operating and release hardware.
  - 1. Style: Provide flat metal covers unless otherwise indicated.
  - 2. Mounting: Provide frames and curbs suitable for mounting conditions indicated on the Drawings.
  - 3. For Stair Access: Single leaf; 30 by 96 inches.
    - a. Product (Basis of Design): Type L 50-TB by Bilco Co..
- C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; Thermally broken; extended bottom flange to suit mounting.
  - 1. Material: Mill finished aluminum, 11 gage, 0.0907 inch thick.
  - 2. Insulation: Manufacturer's standard; 3 inch rigid polyisocyanurate, located on inside hollow curb.
  - 3. Curb Height: 12 inches from surface of roof deck, minimum.
- D. Metal Covers: Flush, insulated, hollow metal construction.
  - 1. Capable of supporting 40 psf live load, with a maximum deflection of 1/150 of span or 20 psf wind uplift.
  - 2. Material: Mill finished aluminum; outer cover 11 gage, 0.0907 inch thick, liner 0.04 inch thick.
  - 3. Insulation: Manufacturer's standard 3 inch rigid polyisocyanurate.
  - 4. Gasket: EPDM, continuous around cover perimeter.
- E. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
  - 1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 45 psf load. Opening of hatch shall be in a controlled manner to avoid damage to surrounding roof surfaces.
  - 2. Hinges: Heavy duty pintle type. Cover shall automatically lock in open position with rigid hold open arm and grip handle to release.
  - 3. Hold open arm with vinyl-coated handle for manual release. Provide interior and exterior handles for stage vents.
  - 4. Latch: Upon closing, engage latch automatically and reset manual release. Latches shall withstand 30 psf wind uplift forces.
  - 5. Manual Release: Pull handle on interior.
  - 6. Roof Access Hatch Locking: Padlock hasp on interior.

## 2.02 NON-PENETRATING ROOFTOP ASSEMBLIES

- A. Safety Railing: Complying with OSHA and ANSI A1264 safety requirements and OSHA strength requirements with a factor of safety of two; corrosion resistant construction. Orientation of barriers shall suit job installation conditions.
  - 1. Applications: Where indicated per the Drawings.
  - 1. Design Loadings and Configurations: As required by applicable codes.
  - 2. Height: 42 inches minimum. Provide minimum clearance of 6 inches under supported items to top of roofing.
  - 3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
  - 4. Finish/Color: Factory finished powder coat. Color selected by Architect from manufacturer's full line.
  - 5. Hardware and accessories as recommended by manufacturer for a complete system.
  - 6. Products:
    - a. Safety 2000 Roof Edge Protection by BlueWater Manufacturing.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 HATCH SAFETY RAILING**

- A. Hatch Safety Railing: Complying with OSHA and ANSI A1264 safety requirements and OSHA strength requirements with a factor of safety of two; corrosion resistant construction. Orientation of barriers shall suit job installation conditions.
  - 1. Products:
    - a. Bil-Guard by Bilco Company.
    - b. Kee Hatch by Kee Industrial Products Inc.,
    - c. Substitutions: See Section 01 60 00 - 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 the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Prior to proceeding with an installation, verify that all necessary blocking, bracing, and supports have been provided.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing weather integrity. Snow guards shall be fastened mechanically to the roof deck. Provide 2 fasteners per snow guard.

### **3.04 CLEANING**

- A. Clean installed work to like-new condition.
- B. Position roof hatches as required to provide a minimum distance to roof edge of 30 inches at hatch ladder access side, as required by OSHA.

### **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**

**SECTION 07 81 00**  
**APPLIED FIREPROOFING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fireproofing of interior and enclosed exterior structural steel as indicated on the Drawings.
- B. Preparation of fireproofing for application of finish specified elsewhere.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 12 00 - Structural Steel Framing.
- B. Section 05 21 00 - Steel Joist Framing.
- C. Section 05 31 00 - Steel Decking.
- D. Section 07 81 23 - Intumescent Mastic Fireproofing.
- E. Section 07 84 00 - Firestopping.
- F. Section 09 90 00 - Painting and Coating: Color paint coat on exposed spray-applied fireproofing. Product subject to acceptance by fireproofing manufacturer.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- B. ASTM E605 - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2011.
- C. ASTM E736 - Standard Test Method For Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2011.
- D. ASTM E760 - Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members; 2011.
- E. ASTM E859 - Standard Test Method for Air Erosion of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2011.
- F. ASTM E937 - Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2011.
- G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2013.
- H. UL - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with placement of ceiling hanger tabs, mechanical component hangers, and electrical components.
- B. Pre-installation Meeting: Convene one week before starting work of this Section.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data indicating product characteristics. Submit independent testing agency reports for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, for:
  - 1. Bond Strength.
  - 2. Bond Impact.
  - 3. Compressive Strength.
  - 4. Fire tests using substrate materials similar those on Project.
  - 5. Primers and other coatings applied to structural steel in the shop or field are compatible with fireproofing application.

- C. Manufacturer's Installation Instructions: Indicate special procedures.
- D. Manufacturer's Certificate: Certify that sprayed-on fireproofing products meet or exceed requirements of contract documents.
- E. Manufacturer's Field Reports: Indicate environmental conditions under which fireproofing materials were installed. Certify each fireproofing product is fully compatible with adhesives, primers, and other surface coatings on substrates intended to receive fireproofing.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this Section, who was trained and approved by the manufacturer and with a minimum five years of documented experience.

**1.07 REGULATORY REQUIREMENTS**

- A. Environmental Compliance: Provide fireproofing products containing no detectable asbestos as determined according to the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

**1.08 MOCK-UP**

- A. Construct a mock-up, 100 square feet in size, for evaluation of surface preparation techniques and application workmanship which conforms to Project requirements for fire-ratings. Locate where directed. Accepted mock-up will serve as a standard of comparison for subsequent work of this Section.
- B. Examine installation within one hour of application to determine variances from specified requirements due to shrinkage, temperature, and humidity.
- C. Where shrinkage and cracking are evident, adjust mixture and method of application as necessary. Remove materials and re-construct mock-up as required until acceptance.
- D. Accepted mock-up may remain as part of the Work. Product(s) manufacturer shall be on-site to review the mock-ups and approve the installation prior to further work commencing.

**1.09 DELIVERY, STORAGE AND PROTECTION**

- A. Delivery: Materials shall be delivered in original sealed containers, clearly marked with suppliers name, brand name and type of material, and bearing U.L. label.
- B. Storage and Handling: Materials shall be stored off the ground and protected from the weather, in strict compliance with the manufacturer's recommendations.

**1.10 FIELD CONDITIONS**

- A. Do not apply spray fireproofing when temperature of substrate material and surrounding air is below 40 degrees F or when temperature is predicted to be below said temperature for 24 hours after application.
- B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.
- C. Provide temporary enclosure to prevent spray from contaminating air.

**1.11 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
  - 1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
  - 2. Reinstall or repair failures that occur within warranty period.

**PART 2 PRODUCTS****2.01 FIREPROOFING ASSEMBLIES**

- A. IBC Type II-A Construction. Provide fire resistance ratings for the following building elements as required by the building code:
  - 1. Primary structural frame, including columns, beams, girders, and trusses: 1 hour.
  - 2. Floor construction, including supporting beams and joists: 1 hour.
  - 3. Roof construction, including supporting beams and joists and deck: 1 hour.
    - a. Roof Construction, including secondary beams and deck and joists where every part of the roof construction is 20 feet or more above finish floor: 0 hours.
- B. UL Assemblies: See tested assemblies appended to the end of this Section.
  - 1. Exposed columns, braces, and other structural items shown on drawings: Provide intumescent fireproofing per Section 07 81 23.
  - 2. Floors: UL No. D925. (No spray fire-proofing required at concrete composite deck – just structure)
  - 3. Roofs: UL No. P732.

**2.02 MATERIALS**

- A. Sprayed Fire-Resistive Material: Manufacturer's standard factory mixed material, which when combined with water is capable of providing the indicated fire resistance.
  - 1. Applications: Concealed interior, exposed interior (see drawings), exterior protected from exposure.
  - 2. Bond Strength, ASTM E736: 430 psf, minimum, when set and dry.
  - 3. Dry Density ASTM E605: 22 lb/cu ft, minimum.
  - 4. Compressive Strength, ASTM E 761: 10% deformation at 100 psi.
  - 5. Effect of Impact on Bonding, ASTM E760: No cracking, spalling or delamination.
  - 6. Corrosivity, ASTM E937: No evidence of corrosion.
  - 7. Air Erosion Resistance, ASTM E859: Weight loss of less than 0.025 g/sq ft, after 24 hrs.
  - 8. Surface Burning Characteristics, ASTM E84: Maximum flame spread of 0 and maximum smoke developed of 0.
  - 9. Fungal Resistance, ASTM G21: No growth after 28 days.
  - 10. Sealer: (Required) Protective, paintable, protective coating as recommended by fireproofing manufacturer.
  - 11. Products:
    - a. Cafco Blaze-Shield HP by Isolatek International
    - b. Monokote Z-106HY by Grace Construction Products.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

**2.03 ACCESSORIES**

- A. Primer Adhesive: Of type recommended by fireproofing manufacturer.
- B. Metal Lath: Expanded metal lath; 3.4 lb/sq ft, galvanized finish. Where required per indicated UL Assemblies.
- C. Water: Clean, potable.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that surfaces are ready to receive fireproofing.
- B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
- C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.

- D. Verify that voids and cracks in substrate have been filled. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

### **3.02 PREPARATION**

- A. Perform tests as recommended by fireproofing manufacturer in situations where adhesion of fireproofing to substrate is in question.
- B. Remove incompatible materials that could affect bond by scraping, brushing, scrubbing, or sandblasting.
- C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
- D. Apply fireproofing manufacturer's recommended bonding agent on primed steel.
- E. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
- F. Close off and seal duct work in areas where fireproofing is being applied.

### **3.03 APPLICATION**

- A. Install metal lath over structural members as indicated or as required by UL Assembly Design Numbers.
- B. Apply primer adhesive in accordance with manufacturer's instructions.
- C. Apply fireproofing in thickness and density necessary to achieve required ratings, with uniform density and texture. Apply in one coat unless otherwise recommended in writing by the manufacturer.
- D. Metal Decks: Do Not apply fireproofing to underside of metal roof deck until roofing has been completed. Prohibit roof traffic during application and drying of fireproofing.
  - 1. Do not apply fireproofing to underside of metal floor deck. Required rating attained from concrete slab thickness. Mask/shield decking as required to prevent overspray of fireproofing from application to supporting structures in areas to remain exposed.
- E. Cure fireproofing according to manufacturer's written recommendations.
- F. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, tested and any required corrections have been made.
- G. Where sealers are used, apply products that are tinted to differentiate them from fireproofing over which they are applied.
- H. Finishes: Apply fireproofing to produce the following finishes:
  - 1. Standard Spray-Texture Finish: Finish according to manufacturer's written instructions for spray-application with no further treatment.
    - a. Applications: Fireproofing to be concealed.
  - 2. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.
    - a. Applications: Fireproofing to remain exposed located at least 10 feet above floor level.
    - b. Rolled-Fireproofing will be painted under Section 09 90 00

### **3.04 FIELD QUALITY CONTROL**

- A. The Owner's testing and inspection agency shall field test and inspect fireproofing after application and curing, prior to its concealment.
- B. Fireproofing shall be tested in accordance with ASTM E605 and ASTM E736 in areas as described below. Do not proceed with fireproofing of next area until test results for previously completed work indicate compliance with requirements.
  - 1. Thickness: Floor (structure) and Roof Assemblies: Floor and roof assembly thickness measurements shall be taken at not less than four (4) random locations for each 1,000 sf of floor and roof surface.

2. Thickness: Structural Framing Members: Structural framing members thickness measurements shall be taken at not less than 25% of the structural members on each floor.
  3. Density: Samples for density determination shall be taken at a rate of not less than one test for each 10,000 sf of sprayed areas in each story, but in no case shall there be less than five (5) per story.
  4. Bond Strength: Floor (structure) and Roof Assemblies: Samples for cohesion/adhesion shall be taken on thoroughly dried material at the rate of not less than one test for each 10,000 sf, or part thereof of the sprayed areas in each story.
  5. Bond Strength: Structural Framing Members: Samples for cohesion/adhesion shall be taken on thoroughly dried material at the rate of not less than one test for each type of structural framing member for each 10,000 sf of floor area or part thereof in each story.
- C. Testing agency shall report test results promptly and in writing to the Contractor, Owner, and Architect.
  - D. Repair or replace fireproofing within areas where test results indicate fireproofing does not comply with requirements.
  - E. Apply additional fireproofing per manufacturer's directions where test results indicate that the thickness does not comply with specified requirements.
  - F. Where fireproofing is removed and replaced or repaired, additional testing will be performed to determine compliance with specified requirements. Any re-tests for areas not in compliance shall be paid for by the Contractor.

### **3.05 CLEANING**

- A. Remove excess material, overspray, droppings, and debris.
- B. Remove fireproofing from materials and surfaces not required to be fireproofed.
- C. At exposed fireproofing, clean surfaces that have become soiled or stained, using manufacturer's recommended procedures.
- D. Remove overspray from piping, electrical devices, ductwork, etc. All floor areas shall be broom cleaned.

**END OF SECTION**



**SECTION 07 81 23**  
**INTUMESCENT MASTIC FIREPROOFING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Thin-film intumescent fire-resistive coatings for exposed structural steel where indicated on the Drawings.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 12 00 - Structural Steel Framing.
- B. Section 05 21 00 - Steel Joist Framing.
- C. Section 07 81 00 - Applied Fireproofing: Conventional cementitious fire-proofing.
- D. Section 09 90 00 – Painting: Finish top coating.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used including performance characteristics, preparation instructions, installation, storage and handling recommendations. Submit test results of fire-resistive designs for structural elements of the types required for the project, indicating hourly ratings of each assembly.
- C. Samples:
  - 1. Verification Samples: For each thickness, color, sheen, and finish required, samples not less than 4 inches square on steel substrate, illustrating finished appearance.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company that specializes in manufacturing the type of products specified, with minimum of 10 years of documented experience.
- B. Installer Qualifications: Approved, certified, or supervised by manufacturer of intumescent fireproofing, with not less than 10 years of documented experience.

**1.06 MOCK-UP**

- A. Construct a mock-up, 100 square feet in size in area designated by the Architect, for evaluation of surface preparation techniques and application workmanship which conforms to Project requirements for fire-ratings. Locate where directed. Accepted mock-up will serve as a standard of comparison for subsequent work of this Section.
  - 1. Evaluate mock-up for compliance with specified requirements, including thickness and finish texture. Manufacturer's representative shall review and approve the mock-up with a letter submitted to the Architect prior to commencement with the work.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are accepted by Architect. Refinish mock-up area as required to produce acceptable work.
  - 3. Accepted mock-up may remain as part of the Project.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in manufacturer's original, unopened containers with identification labels and testing agency markings intact and legible.
- B. Store products in manufacturer's unopened packaging until ready for installation.
  - 1. Store at temperatures not less than 50 degrees F in dry, protected area.
  - 2. Protect from freezing, and do not store in direct sunlight.

3. Dispose of any materials that have come into contact with contaminants of any kind prior to application.
- C. Dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

### **1.08 FIELD CONDITIONS**

- A. Protect areas of application from windblown dust and rain.
- B. Maintain ambient field conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under ambient conditions outside manufacturer's absolute limits.
  1. Provide temporary enclosures as required to control ambient conditions.
  2. Do not apply intumescent fireproofing when ambient temperatures are below 50 degrees F without specific approval from manufacturer.
  3. Maintain relative humidity between 40 and 60 percent in areas of application.
  4. Maintain ventilation in enclosed spaces during application and for not less than 72 hours afterward.

## **PART 2 PRODUCTS**

### **2.01 SYSTEM REQUIREMENTS**

- A. Fireproofing: Provide intumescent thin-film fire-resistive coating systems tested by an independent testing agency in accordance with ASTM E119 and acceptable to Authority Having Jurisdiction.
  1. IBC Type II-A construction. See the Drawings for areas of structure to remain exposed to receive intumescent fire-resistive coating system. Provide fire-resistance ratings for building elements as follows:
    - a. Primary structural frame, including columns, girders, and trusses: 1 hour.
    - b. Floor construction, including supporting beams and joists: 1 hour.
    - c. Roof construction, including supporting beams and joists: 1 hour.
  2. Areas of structure to receive intumescent fire-resistive coating system:
    - a. Exposed columns and bracing; see drawings.
    - b. Floor construction, including supporting beams and joists: Where indicated. Do not spray concrete floor deck. Concrete achieves the required fire rating.
    - c. Roof construction, including supporting beams and joists: Where indicated.
- B. Steel: See tested assemblies appended to the end of this Section.
  1. Columns – 1 hour: X-625, X-650.
  2. Beams – 1 hour: UL N-607

### **2.03 MATERIALS**

- A. Interior Fire-Resistive Coating System: Thin film, water-based intumescent coating system for the fire protection of interior structural steel. Coating to remain exposed to view.
  1. Surface Burning Characteristics, ASTM E84: Flame Spread Index of 25, maximum and Smoke Developed Index of 50, maximum.
  2. Hardness, Shore D: 45-50.
  3. Compressive strength, ASTM D695: 300 psi.
  4. Bond Strength, ASTM D952: 40 psi.
  5. Abrasion Resistance, ASTM D1044: 0 grams loss.
  6. Dry Applied Density: 85 pcf.
  7. Products:
    - a. CAFCO Sprayfilm WB 4 by Isolatek International
    - b. Nullifire S607 by Carboline Co.
    - c. Albi-Clad TF by Albi Manufacturing.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Sealers and Primers: As recommended by the manufacturer for the applications.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine substrates to determine if they are in satisfactory condition to receive intumescent fireproofing. Verify that they are clean and free of oil, grease, incompatible primers, or other foreign substances capable of impairing bond to fireproofing system.
- B. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02 PREPARATION**

- A. Thoroughly clean surfaces to receive fireproofing.
- B. Repair substrates to remove surface imperfections that could affect uniformity of texture and thickness of fireproofing system. Remove minor projections and fill voids that could telegraph through the finished work.
- C. Cover or otherwise protect other work that might be damaged by fallout or overspray of fireproofing system. Provide temporary enclosures as necessary to confine operations and maintain required ambient field conditions.

**3.03 INSTALLATION**

- A. Comply with manufacturer's instructions for particular conditions of installation in each case.
- B. Apply manufacturer's recommended primer to required coating thickness.
- C. Apply fireproofing to full thickness over entire area of each substrate to be protected. Apply coats at manufacturer's recommended rate to achieve dry film thickness required for fire resistance ratings designated for each condition.
- D. Apply intumescent fireproofing by spraying to maximum extent possible. If necessary, complete coverage by roller application or other method acceptable to manufacturer.
- E. Apply protective / decorative topcoats as recommended by the manufacturer. Achieve uniform finished appearance complying with approved mock-up.

**3.04 FIELD QUALITY CONTROL**

- A. The Owner's testing and inspection agency shall field test and inspect intumescent fireproofing after application and curing.
  - 1. Intumescent fireproofing thickness shall be tested in accordance with SSPC-PA2 by magnetic thickness gage.
- B. Testing agency shall report test results promptly and in writing to the Contractor, Owner, and Architect.
- C. Repair or replace fireproofing at locations where test results indicate fireproofing does not meet specified requirements. Where fireproofing is removed and replaced or repaired, additional testing will be performed to determine compliance with specified requirements. Any re-tests for areas not in compliance shall be paid for by the Contractor.

**3.05 CLEANING**

- A. Immediately after installation of fireproofing in each area, remove overspray and fallout from other surfaces and clean soiled areas.

**3.06 PROTECTION**

- A. Protect installed intumescent fireproofing from damage due to subsequent construction activities, so fireproofing is without damage or deterioration at time of Substantial Completion.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**

**SECTION 07 84 00  
FIRESTOPPING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Firestopping systems for all penetrations and interruptions to fire-rated assemblies, smoke barriers, non-fire rated floor assemblies, whether indicated on drawings or not, and other openings indicated. See the Drawings for assembly fire ratings.
- B. Identification signage.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 21 00 - Insulation: Fiber Firestopping Insulation.
- B. Section 07 81 00 - Applied Fireproofing.
- C. Section 07 81 23 - Intumescent Mastic Fireproofing.
- D. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing and deflection head track types.
- E. Division 21 - Fire Protection: Firestopping of fire protection work.
- F. Division 22 - Plumbing: Firestopping of plumbing work.
- G. Division 23 - HVAC: Firestopping of heating, ventilating and air conditioning work.
- H. Division 26 - Electrical: Firestopping of electrical work.
- I. Division 27 – Communications: Firestopping of communications work.

**1.03 REFERENCE STANDARDS**

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2014.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a.
- C. ASTM E1966 - Standard Test Method for Fire Resistive Joint Systems; 2011.
- D. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2015a.
- E. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013.
- F. ITS - Directory of Listed Products; current edition.
- G. FM P7825 - Approval Guide; current edition.
- H. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; 2004.
- I. UL - Fire Resistance Directory; current edition.

**1.04 DEFINITIONS**

- A. Annular Space is the opening around an item (pipe, duct, etc.) penetrating a construction assembly.
- B. Fire-resistance is the property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases, or flames under conditions of use.
- C. Fire-resistive joint system is the assemblage of specific materials or products that are designed, tested and fire-resistance rated in accordance with ASTM E119 to resist for a prescribed period of time the spread of fire through joints in or between fire-resistance rated assemblies.
- D. Firestopping is a specific assembly of materials or products fill openings and annular spaces around penetrating items (such as cables, cable trays, conduits, ducts, pipes) and their means

of support through the wall, floor, ceiling or roof to prevent spread of fire and includes fire-resistive joint systems and through-penetration firestop systems.

- E. Through-penetration is an opening that passes entirely through a fire-resistance rated assembly.
- F. Through-penetration firestop system is a specific assembly of materials that are designed, tested and installed to prevent the spread of fire through openings in fire-resistive rated floors and walls to accommodate through-penetrations of electrical, mechanical, plumbing, and communications systems.
- G. "F" rating indicates the period of time that the through-penetration firestop system is capable of preventing the passage of flame to the unexposed (non-fire) side of the assembly in conjunction with an acceptable hose stream test performance.
- H. "T" rating indicates the period of time that the through-penetration firestop system is capable of preventing the passage of flame and temperature rise of 325 degrees F. above ambient temperature on the unexposed (non-fire) side of the assembly in conjunction with an acceptable hose stream test performance.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance ratings, and limitations. A coordinated submittal shall be prepared for all firestopping used on the Project.
- C. Shop Drawings: Submit manufacturer's illustrated test assembly shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system and fire-resistant joint system, each construction condition and type of penetration or joint. Include firestop design designation from the approved testing agency (UL, for example).
  - 1. For those firestop applications for which no tested system is available from the manufacturer, the manufacturer's engineering judgment derived from similar tested system designs or other tests shall be submitted to the Authority Having Jurisdiction for their review and approval prior to installation.
  - 2. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
  - 3. One firestopping submittal shall cover products used for all phases of multi-phase projects.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Installer Qualifications: Submit qualification statements for installing mechanics.

#### **1.06 QUALITY ASSURANCE**

- A. Single Source: If the Contractor determines that individual trades (i.e. mechanical, plumbing, fire protection, electrical) shall be responsible for firestopping their penetrations, instead of all firestopping provided by a single contractor, products used shall be coordinated among the various trades by the Contractor so that multiple products or manufacturers are NOT used for the same type of application.
  - 1. The Contractor shall provide a coordinated submittal for all firestopping used on the Project.
- B. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
  - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
  - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at [www.icc-es.org](http://www.icc-es.org) will be considered as constituting an acceptable test report.
  - 3. For those firestop applications that exist for which no approved tested system is available through a manufacturer, an engineered judgment derived from similar system designs or

other approved tests shall be submitted to the local Authority Having Jurisdiction for review and approval prior to installation. Engineering judgment drawings shall follow requirements set forth by the International Firestop Council.

- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten years documented experience.
- D. Installer Qualifications: Company or personnel specializing in performing the work of this Section, trained by the firestop manufacturer(s) and with a minimum of 3 years documented experience installing work of this type. Submit written qualifications statements for installing mechanics.

#### **1.07 MOCK-UP**

- A. Install one firestopping assembly representative of each fire rating design required on Project.
  - 1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
  - 2. Where firestopping is intended to fill a linear opening, install minimum of 1 linear ft.
- B. Obtain approval of authority having jurisdiction and testing agency before proceeding.
- C. Remove and replace unsatisfactory mock-ups. Accepted mock-ups shall represent minimum standards for the Work.
- D. Accepted mock-ups may remain as part of the Work.

#### **1.08 FIELD CONDITIONS**

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

### **PART 2 PRODUCTS**

#### **2.01 FIRESTOPPING GENERAL REQUIREMENTS**

- A. Firestopping: All products shall be by one of the following acceptable manufacturers and shall be specific for each construction condition, fire-resistance requirement, and annular size. Multiple products shall not be used for the same application. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Basis of Design: Hilti Inc.
- C. Acceptable Manufacturers:
  - 1. 3M Fire Protection Products.
  - 2. Tremco.
  - 3. AD Fire Protection Systems, Inc.
  - 4. Nelson FireStop Products.
  - 5. Specified Technologies, Inc.
  - 6. BioShield.
  - 7. Metacaulk - RectorSeal Corp
  - 8. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.
- E. Fire Ratings: See Drawings for required systems and ratings.

**2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS**

- A. Provide firestop systems manufactured and installed to resist spread of fire, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated for:
  - 1. Fire rated non-load bearing partitions.
  - 2. Fire rated floor assemblies and roof assemblies
  - 3. Fire rated smoke barriers.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa). Fire-resistance-rated walls include fire separation walls and fire-barrier walls.
  - 1. F-ratings as determined by ASTM E814, but not less than that equaling or exceeding fire resistance rating of the construction penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
  - 1. Horizontal assemblies include floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.
  - 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
  - 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
  - 4. Provide firestop systems with T-ratings in addition to F-ratings as determined by ASTM E814, where systems protect penetrations located outside wall cavities, located outside fire-resistive shaft enclosures, located in construction containing fire protection rated openings and at penetrating items larger than 4 inches in diameter pipe or 16 sq inches cross sectional area.
- D. For firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
  - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant firestop systems.
  - 2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
  - 3. For penetrations involving insulated piping, provide firestop systems not requiring removal of insulation.
  - 4. For firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed.
  - 5. Provide fastened paintable metal escutcheon cover at all exposed penetrations to finish the installation in a concealed manner.
- E. Provide firestop systems that are compatible with one another and the substrates they are in contact with based on testing and field experience.
- F. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the VOC limit contents per 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Sealants: 250 g/L.
  - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 3. Sealant Primers for Porous Substrates: 775 g/L.
- G. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.
- H. Mold Resistance: Provide firestopping materials with mold and mildew resistance rating of 0 as determined by ASTM G21.



- I. Head-of-Wall Firestopping at Joints Between Non-Rated Floor and Fire-Rated Wall: Use any system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
  1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
    - a. Coordinate with Section 09 21 16 - Gypsum Board Assemblies for deflection head tracks at fire-rated assemblies with greater than 1/2 inch of movement.
    - b. See details for scribed and clean finish of exposed drywall.

## 2.03 OTHER MATERIALS

- A. Accessories: Provide components for each firestop system that are needed to install fill materials and to comply with performance requirements. Use only components specified by firestop system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
  1. Permanent forming/damming/backing materials, including the following:
    - a. Slag/rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
    - e. Substrate primers.
    - f. Collars.
    - g. Steel sleeves.
    - h. Paintable Metal Escutcheon plates for use in exposed areas.
- B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrating item.
- E. Intumescent Putties: Non-hardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags.
- I. Silicone Foam: Multi-component, silicone-based liquid elastomer that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants, pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping, gunnable sealant, unless indicated firestop system limits use to non-sag grade for both opening conditions.
- K. Caulking Compound (fire sealant): Material approved by the safing insulation manufacturer for sealing joints between foil backing of safing insulation and edge of concrete floor slab against smoke penetration.

- L. Safing Clips: Galvanized steel safing clips approved by the safing insulation manufacturer for holding insulation in place.
- M. Sleeves for through-penetrations shall be of non-combustible materials and securely fastened to the assembly penetrated. Sleeves through floors in exposed locations, behind kitchen cooking line equipment for piping and conduit, for example, shall extend 1" above the floor surface to stop water seepage to floor below.
- N. Identification Signage: Pressure sensitive self-adhesive, preprinted vinyl labels; including the following information on labels:
  - 1. "Warning - Through Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, phone number.
  - 3. Firestop system designation of applicable testing and inspecting agency (UL or WH).
  - 4. Date of installation.
  - 5. Firestop system manufacturer's name.
  - 6. Installer's name.Labeling to remain exposed to view shall be reviewed by Architect for location and size prior to marking.
- O. Primers: Type required for tested assembly design.
- P. Fiber Firestopping Insulation (Safing Insulation): Mineral fiber batt, unfaced insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening; conforming to ASTM C 665 Type 1.
  - 1. Density, ASTM D 1622: 4 lb/cu ft min.
  - 2. Max. Water Absorption, ASTM C 272: 0.1% by volume.
  - 3. Durability and Longevity: Permanent.
  - 4. Fire Resistance, ASTM E84: Flame spread: 15; Smoke Developed: 0.
  - 5. Manufacturer's "Z" impaling clips as required
  - 6. Product for Curtainwalls: Foil faced Thermafiber Curtainwall Insulation by USG.
  - 7. Products:
    - a. Thermafiber by United States Gypsum Co.
    - b. Safing Insulation / MW by Owens Corning Insulation.
    - c. FBX Safing Insulation by Fibrex Insulations, Inc.
    - d. Safe by Roxul Inc.

## **2.04 FIRESTOPPING ASSEMBLY REQUIREMENTS**

- A. Perimeter Fire Containment Firestopping: Use any system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of the floor assembly.
  - 1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
  - 2. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.

## **2.05 FIRESTOPPING FOR FLOOR-TO-FLOOR, WALL-TO-FLOOR, AND WALL-TO-WALL JOINTS**

- A. Concrete Floors:
  - 1. Floor to Floor Joints:
    - a. 1 Hour Construction: UL System FF-D-1013; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
- B. Gypsum Board Walls:
  - 1. Wall to Wall Joints:
    - a. 2 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
    - b. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
  - 2. Top of Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:

- a. 2 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
  - b. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
3. Top of Wall Joints at Concrete Over Metal Deck, Wall Parallel to Ribs:
  - a. 2 Hour Construction: UL System HW-D-0049; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
  - b. 1 Hour Construction: UL System HW-D-0049; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
4. Top of Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Cut to Fit Ribs:
  - a. 2 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
  - b. 1 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
5. Top of Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Not Cut to Fit:
  - a. 2 Hour Construction: UL System HW-D-0042; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
  - b. 1 Hour Construction: UL System HW-D-0042; Hilti CFS-SP WB Firestop Joint Spray and CP 672.

## **2.07 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS**

- A. Blank Openings:
  1. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
  2. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
- B. Penetrations By:
  1. Multiple Penetrations in Large Openings:
    - a. 2 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - b. 2 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - c. 2 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - d. 2 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
    - e. 1 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - f. 1 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - g. 1 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  2. Uninsulated Metallic Pipe, Conduit, and Tubing:
    - a. 2 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - b. 2 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - c. 1 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant. MAX
    - d. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
    - a. 2 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
    - b. 2 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    - c. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.

- d. 1 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
- 4. Electrical Cables Not In Conduit:
  - a. 2 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
  - b. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
  - c. 1 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
  - d. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
- 5. Cable Trays with Electrical Cables:
  - a. 2 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
  - b. 2 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  - c. 1 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
  - d. 1 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
- 6. Insulated Pipes:
  - a. 2 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  - b. 2 Hour Construction: UL System W-L-5029; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  - c. 1 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  - d. 1 Hour Construction: UL System W-L-5029; Hilti FS-ONE MAX Intumescent Firestop Sealant.
- 7. HVAC Ducts, Insulated:
  - a. 2 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.
  - b. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify openings are ready to receive the work of this Section.

### **3.02 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.

### **3.03 INSTALLATION**

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Coordinate with mechanical, fire protection, electrical, and other trades to assure that all pipes, conduits, cable trays, cables, ducts, and other items that penetrate fire-resistant construction are properly firestopped.
- C. Install dams where recommended or required by tested fire-resistive joint assemblies and through-penetration firestop systems. Combustible damming material and other accessories not indicated as permanent components of firestop systems shall be removed after appropriate curing.

- D. Install firestopping materials in conjunction with fiber firestopping insulation (firesafing insulation) as required by tested assemblies.
- E. Where cable trays penetrate fire-resistant wall assemblies, provide pillow type firestop product. All cabling /wiring sleeves whether empty or utilized for wiring through fire-resistant assemblies shall be firestopped.
- F. Do not cover installed firestopping until inspected by Authority Having Jurisdiction and/or testing agency.
- G. In general, for fire containment at perimeter curtainwall systems, firesafing insulation shall be mechanically attached to curtainwall mullions and transoms using impaling pins, screws or other positive mechanical attachment as required. Install in strict accordance with the manufacturer's tested assemblies and recommendations. Firesafing insulation shall be compression fit into the floor line void between floor structure and curtainwall firesafing, supported with "Z" clips. Coordinate with the work of Section 07 84 00 - Firestopping
  - 1. Install a light gage steel angle or channel continuously behind the insulation and attached to the vertical mullions at the floor firesafing line to prevent bowing of the curtainwall insulation due to compression of the firesafing insulation at the floor line. Exposed curtainwall mullions shall be protected with firesafing mullion covers.
  - 2. Install insulation between aluminum framing members and other surfaces with insulation fitting snugly to prevent settling. All voids and gaps shall be completely filled.
  - 3. Firestopping shall be installed on the floor line firesafing insulation. Installations shall be in accordance with UL tested assemblies.

### **3.04 CLEANING**

- A. Clean adjacent surfaces of firestopping materials.

### **3.05 IDENTIFICATION**

- A. Identify all firestop system locations with pressure sensitive self-adhesive, pre-printed vinyl labels.
  - 1. Attach labels permanently to both sides of penetrated construction surfaces and joints in fire-rated construction.
  - 2. Labels shall be visible to anyone seeking to disturb or remove penetrating items or firestop system. Where possible, labels shall be installed above finished ceilings. Where installed in exposed locations, labels shall be neatly located.
  - 3. Labels for horizontal joints shall be installed at a maximum spacing of ten (10) feet.

### **3.06 FIELD QUALITY CONTROL**

- A. Prepare and install firestopping systems in accordance with manufacturer's shop drawings, tested assemblies and instructions
  - 1. Follow safety procedures recommended in Material Safety Data Sheets.
  - 2. Finish all firestopping surfaces that are to remain exposed in the completed Work to a uniform and level condition.
- B. Firestopping materials and installations at joints and penetrations in fire-resistive rated assemblies and smoke barrier assemblies shall not be concealed from view until inspected and approved by the Authority Having Jurisdiction or, if designated, by the Owner's testing agency. Such inspection shall include partial destructive inspection to determine compliance with tested firestop assembly requirements. All such locations shall be repaired or replaced by the Contractor at no additional cost to the Owner.
  - 1. All firestopping locations shall be visually inspected.
  - 2. At a minimum, not less than 5% of all firestopping joints and penetrations shall be inspected by removal of materials to determine conformance to assembly requirements.
- C. Inspections by the AHJ and /or the testing agency shall not relieve the Contractor of responsibility for providing his own inspections and quality control in compliance with specified requirements.

- D. Inspections shall be performed as required by the building code, the Construction Documents or as otherwise directed by the Architect.
- E. The Contractor shall cooperate with individuals conducting such inspections. The Contractor shall notify inspectors at least five (5) days in advance of requested inspection date. All identification labeling, firestopping and smoke sealing work shall be completed prior to inspection.
- F. Any non-compliant materials shall be removed and replaced. Any locations missing required protection shall be corrected by the Contractor and re-inspected prior to concealing such areas with other construction. Any material or workmanship that is rejected shall be corrected and /or replaced promptly by the Contractor to the satisfaction of the inspector and/or Architect, and at no additional cost to the Owner.

### **3.07 PROTECTION**

- A. Clean adjacent surfaces of firestopping materials. Leave work in a neat and clean condition.
- B. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

**SECTION 07 90 05  
JOINT SEALERS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Sealants and joint backing.
- B. Compressible fillers.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 84 00 - Firestopping: Firestopping sealants.
- B. Section 09 21 16 - Gypsum Board Assemblies: Acoustic construction.

**1.03 REFERENCE STANDARDS**

- A. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with other Sections referencing this Section.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Samples: Submit samples 2 inch in size illustrating sealant colors for selection.
- D. Manufacturer's Installation Instructions: Indicate special procedures.

**1.06 QUALITY ASSURANCE**

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Applicator Qualifications: Company specializing in performing the work of this Section with minimum five years experience. Where applicable, applicators shall be approved by their respective material manufacturers as licensed applicators. All applicators shall be skilled personnel who are thoroughly trained and experienced in the necessary skills, completely familiar with the specific requirements of the Work.

**1.07 MOCK-UPS AND SAMPLE INSTALLATIONS**

- A. Mock-Up: Provide sealants for exterior wall mock-up panels specified in Section 04 20 00 and Section 07 42 13.
  - 1. Mock-up panels shall demonstrate actual wall construction, detailing and workmanship.
  - 2. No work shall progress until the Architect has reviewed the mock-up panels. Panels shall be revised as necessary to secure the Architect's acceptance and shall then become the standard of comparison for all related exterior wall work.
  - 3. Mock-up panels shall not be destroyed or moved until the Work is complete and accepted by the Architect. Upon completion of construction, mock-up panel(s) shall be removed.
- B. Sample Installations:
  - 1. Provide sealant joints in conjunction with sample window installation per Section 08 43 13 - Aluminum Framed Storefront and Section 08 54 13 - Fiberglass Windows, under provisions of Section 01 40 00.
  - 2. Provide sample exterior sealant installation at brick masonry. No work shall progress until the Architect has reviewed the sample installation. Make revisions as necessary to secure



the Architect's acceptance and shall then become the standard of comparison for all related exterior wall work.

- a. Locate where directed.
- b. Accepted sample installations may remain as part of the Work.
- c. Joint sealer manufacturer representative shall review the installation and compatibility between adjoin materials and submit a report based on inspection of the mock-up(s).
  1. Report shall be based on review of Aluminum Framed Storefront and Curtain Wall
  2. Report shall be based on review of Fiberglass Windows.

#### **1.08 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.
- B. Do not proceed with application of materials when surface or air temperatures are less than 40 degrees F or likely to drop to below 40 degrees F in the following 24 hours after sealant installation.
- C. Do not apply materials unless surface to receive coating is clean and dry, or if precipitation is imminent.
- D. Coordination: It shall be the responsibility of the Contractor to properly coordinate the Work of this Section with that of all other trades in order to ensure the providing of complete and continuous sealing and consistent use of products specified herein.

#### **1.09 WARRANTY**

- A. See Section 01 78 10 - Warranties, for additional warranty requirements.
- B. Warranties:
  1. Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
    - a. Urethane Sealants: Five years.
    - b. Silicone Sealants: Twenty years, unless otherwise indicated with product description.
  2. Provide manufacturer's non-stain warranty.
- C. The installer shall provide an installation warranty that all Sealing shall be free of defects of materials and workmanship for two (2) years; and shall repair and/or replace such defective work, during the warranty term, without extra cost to the Owner.
  1. The following types of sealing failures will be considered defective Work: Leakage, loosening, loss of bond, hardening, cracking, crumbling, melting, shrinking, running, sagging, improper tooling, discoloration, or staining of adjacent work.

### **PART 2 PRODUCTS**

#### **2.01 SEALANTS**

- A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. General Purpose Exterior Sealant: Silicone, ASTM C 920, Grade NS, Class 100/50, Uses T, NT, A, G, M, O; single component, neutral curing, non-sagging, non-staining, non-bleeding, ultra-low-modulus.
  1. Color: To be selected by Architect from manufacturer's standard range.
  2. Product: 756 by Dow Corning.
  3. Substitutions: See Section 01 60 00 - Product Requirements.
  4. Movement Capability: Plus 100 percent, minus 50 percent.
  5. Shore A Hardness Range: 15.
  6. Applications: High movement joints.
    - a. Joints between concrete and other materials.
    - b. Joints between metal frames and other materials.
    - c. Joints between dissimilar materials and building construction.

7. Note: Compatibility with materials sealant shall be in contact with shall be verified prior to use.
  8. Limitations: Not for use in structural applications, below grade or to materials that outgas, on brass, copper, or materials that can corrode, at joints continuously immersed in water, interior firestop sealing, at materials that bleed oils, plasticizers, or solvents, in confined spaces, to surfaces that will be painted, to surfaces in contact with food, to wet surfaces, to architectural finishes without prior testing, and as otherwise limited by the manufacturer.
- C. General Purpose Sealant: Polyurethane; ASTM C 920, Grade NS, Class 50, Uses T, NT, I, M, O, and A; chemically curing, multi- component, low modulus.
1. Color: Multiple colors selected from manufacturer's standard range.
  2. Products: For greater movement.
    - a. Dymeric 240/240FC by Tremco Inc..
    - b. Sikaflex-2cNS/SL by Sika Corp.
    - c. Dynatrol II by Pecora Sealants.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
  3. Movement Capability: Plus 50 percent, minus 50 percent.
  4. Shore A Hardness Range: 25-35.
  5. Interior joints in masonry, concrete, subject to dynamic movement.
  6. Interior Applications: Smoke and acoustic sealant at high movement joints.
  7. Joint size: 1/4" min to 2" max width and 1/4" min to 1/2" max depth.
  8. Note: Compatibility with materials sealant shall be in contact with shall be verified prior to use.
  9. Limitations: Not for use at glass, acrylic or polycarbonate sheets, vehicular traffic joints, at joints under constant water submersion, in contact with polystyrene, in contact with special architectural finishes without prior testing, and as otherwise limited by the manufacturer.
- D. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
1. Products:
    - a. Acrylic Latex 834 by Tremco Inc..
    - b. AC20 + Silicone by Pecora.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
  2. Applications: For minimal movement.
    - a. Interior wall and ceiling control joints.
    - b. Joints between door and window frames and wall surfaces, where minimal movement is expected and will receive field painting.
    - c. Interior sound sealing, non-fire rated smoke sealing where little movement is anticipated.
    - d. Other interior joints for which no other type of sealant is indicated.
  3. Note: Compatibility with materials sealant shall be in contact with shall be verified prior to use.
  4. Limitations: Not for use at joints subject to dynamic movement, submerged in water, and as otherwise limited by the manufacturer.
- E. Interior Silicone Sealant: Silicone; ASTM C 920, Uses I, M and A; single component, mildew resistant.
1. Color: As selected from the manufacturer's full color range.
  2. Products:
    - a. Tremsil 200 by Tremco Inc..
    - b. 786 Silicone Sealant by Dow Corning.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
  3. Applications: Sanitary
    - a. Joints between plumbing fixtures and floor and wall surfaces.
    - b. Joints between all countertops to splashes to wall surfaces.

4. Note: Compatibility with materials sealant shall be in contact with shall be verified prior to use.
5. Limitations: Not for use at joints submerged in water, at porous materials like masonry, and as otherwise limited by the manufacturer.
- F. Interior Floor Joint Sealant: Polyurethane, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A; single component.
  1. Color: Match adjacent finished surfaces.
  2. Applications: Use for:
    - a. Expansion joints in floors.
  3. Products:
    - a. Tremco; Vulkem 455.
    - b. Pecora Corporation; NR-201 Self-Leveling Traffic and Loop Sealant
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.02 ACCESSORIES**

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing (Exterior): Closed-cell polyethylene, non-bleeding neoprene or butyl rod, diameter approximately 30% greater than width of the joint, as recommended by the sealant manufacturer.
- D. Joint Backing (Interior): Open-cell polyurethane foam rod, diameter approximately 30% greater than width of the joint, as recommended by the sealant manufacturer.
- E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- F. Compressible Filler: Compressible, open-cell polyurethane foam saturated with stabilizing acrylics, with a waterproof sealing compound/release agent. Size appropriately to fill void geometry, as recommended by the sealant manufacturer.
  1. Products - general:
    - a. Polytite Standard by Polytite Manufacturing Corp.
    - b. Grayflex by Emseal Joint Systems Ltd., or as recommended by the sealant manufacturer.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify the Contractor of conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected by the Contractor to meet acceptable industry standards in a manner acceptable to the Architect.
- C. Verify that joint backing and release tapes are compatible with sealant.

### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement. Mask off adjoining surfaces as needed to prevent surface damage.
- E. Exposed Concrete Floor Joints: Test joint filler in inconspicuous area of floor slab. Verify specified product does not stain or discolor slab.

**3.03 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Sealing at Acoustical Construction: At construction designated "Acoustical Construction" seal around all joints and pipe, conduit, structural member, duct, and electrical box openings to gypsum wallboard or masonry as applicable. Seal bottom of gypsum wallboard partitions to floor slabs. Seal tops of masonry and gypsum wallboard partitions to decks (including voids at fluted decks), and seal sides of partitions to abutting construction. Note: Sealing related to installation of partition framing members and gypsum wallboard is specified under Section 09 21 16 - Gypsum Board Assemblies.
- E. Non-Fire Rated Smoke Sealing: At building assemblies identified as non-fire rated smoke barriers, seal all joints and pipe, conduit, structural member, duct and electrical box openings. Openings above finish ceilings or other concealed locations may be sealed on one side only. All openings and annular spaces shall be backed with fire safing insulation prior to installation of sealant.
- F. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
- G. Do not leave gaps between ends of joint backers. Do not twist, stretch or tear backers.
- H. Install bond breaker where joint backing is not used. Back rods shall be 25% wider than the joint width.
- I. Application of Sealant: Sealant shall be gun-applied through a nozzle opening of such diameter so that the full bead of sealant is gunned into the joint, filling the joint completely. A superficial or skin bead will not be acceptable.
  - 1. Sealant geometry (depth to width ratios) shall be as recommended by the manufacturer for each specific application.
  - 2. Beads shall be tooled immediately after application to ensure firm, full contact with the inner faces of the joint. Excess material shall be struck off with a tooling stick or knife.
  - 3. The finished bead shall be smooth, properly contoured and flush with the adjacent surface, or as otherwise indicated.
  - 4. Remove all excess materials and smears adjacent to the joint as work progresses. All materials shall be used in accordance with the manufacturer's printed instructions.
- J. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- K. Apply sealant when joint is cool to minimize chances of delamination and wrinkles.
- L. Tool joints concave.
- M. Fillers: Avoid joints except at ends, corners, and intersections; seal all joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface.
- N. Concrete Floor Joint Filler: Install concrete floor joint filler per manufacturer's written instructions. After floor joint filler is fully cured, shave joint filler flush with top of concrete slab.

**3.04 FIELD QUALITY CONTROL**

- A. Perform stain tests in accord with manufacturer's instructions and ASTM C1248 on mock-up joints prior to start of job installation.
- B. Perform adhesion tests in accord with manufacturer's instructions and ASTM C1193, Method A, Field Applied Sealant Joints Hand Pull Test.
  - 1. Perform tests on mock-up joints prior to start of job installation.
  - 2. Perform a minimum of 1 test for every 200 linear feet of applied sealant and one (1) test per floor per building elevation minimum.
  - 3. For sealant applied to dissimilar materials, test both sides of the joint.

- C. Sealant failing test shall be removed, surfaces cleaned, resealed and retested.
- D. Maintain a test log and submit report to the Architect indicating tests, locations, dates, results and remedial action.

**3.05 CLEANING**

- A. Clean adjacent soiled surfaces.

**3.06 PROTECTION**

- A. Protect sealants until cured.

**END OF SECTION**

**SECTION 08 11 13**  
**HOLLOW METAL DOORS AND FRAMES**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Steel interior frames for wood doors; and steel frames (borrowed lites) for glazing.
- B. Engineering of large opening frames, butt glazed frames and any other conditions that may exceed standard frame construction and reinforcement to provide rigid assemblies with heavy use swing doors.
- C. Acoustic door and frame assemblies, frames, seals, thresholds, hardware and additional items required by the sound tested assembly.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 16 14 – Clad Wood Doors.
- B. Section 08 71 00 - Door Hardware.
- B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 90 00 - Painting and Coating: Field painting.
- D. Division 26 - Electrical: Security system interface with doors and frames.

**1.03 REFERENCE STANDARDS**

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- D. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- E. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- F. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).
- G. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
- H. ITS - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- I. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.
- J. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2006.
- K. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
- L. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2012.
- M. UL - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- N. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- O. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- P. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.
- Q. SDI 117: Manufacturing Tolerances for Standard Steel Doors and Frames.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, cores, sound ratings, profiles, anchorage and fastening methods, and finishes. Submit illustrations and descriptions of all seals and hardware for sound rated door assemblies.
- C. Shop Drawings: Details of each opening, showing elevations, fire-ratings, glazing, frame profiles, anchors, and identifying location of different finishes, if any.
- D. Test Reports: Submit sound rated door assembly certified laboratory test results indicating a Sound Transmission Class (STC) rating of at least 52, or as indicated on the Door Schedule, when tested in accordance with ASTM E90 and E413. Submit at least two acoustic field tests showing that comparable installations have been measured in excess of a Noise Isolation Class (NIC) which is not more than four points below the specified STC rating following the procedures set forth in ASTM E 336
- E. Samples: Upon request, submit one sample of door construction, 8x8 inch in size cut from top corner of door and samples of lite frame section.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten years documented experience and a member of the Steel Door Institute.
- B. Maintain at the project site a copy of all reference standards dealing with installation.
- C. Sound Rated Door Assemblies: Sound (acoustic) rated door and frames with appropriate sound seal hardware shall provide required STC rating per ASTM E-90 and E-413 and shall be verified by independent test laboratory certification.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store in accordance with NAAMM HMMA 840. Store all materials upright, in a protected dry area, at least 1" or more off the ground or floor and at least 1/4" between individual pieces. Materials shall not be permitted to rust or corrode.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

**1.08 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.
- B. For acoustic rated door and frame assemblies provide manufacturer's five year warranty.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Steel Frames:
  - 1. Ceco.
  - 2. Republic Doors
  - 3. Steelcraft.
  - 4. Curries Door Co.
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Acoustic Rated Frame Assemblies:
  - 1. Krieger Specialty Products.
  - 2. Overly Door Company.
  - 3. Noise Barriers LLC.
  - 4. Security Metal Products.
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.



**2.02 FRAMES**

- A. Requirements for Frames:
1. Accessibility: Comply with ANSI/ICC A117.1.
  2. Glazed Lights: Non-removable stops on secure side; sizes and configurations as indicated on Drawings. NOTE: Bottom of glazed lights must extend to within 43" of the floor and shall be at least 10" above the floor.
  3. Hardware Preparation: In accordance with DHI A115 Series, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
  4. Galvanizing for units in wet areas, specifically the Multi-Lab Locations: All components hot-dipped zinc-iron alloy-coated (galvannealed), A60/ZF180.
  5. Finish: Factory primed, for field finishing.
- B. Materials:
1. Cold-Rolled Sheet Steel: ASTM A1008, Commercial Steel, Type B, suitable for exposed applications.
  2. Metallic-Coated Sheet Steel: ASTM A653, Commercial Steel, Type B, coating as indicated.
  3. Frame Anchors: ASTM A653, Commercial Steel, Type B, coating as indicated.
- C. Combined Requirements: If a particular frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; where two requirements conflict, comply with the most stringent.
- D. Fire-Rated Door Assemblies:
1. All fire-rated frames shall conform to and/or be tested by the requirements of:
    - a. UL 10C - Pressure Fire Test of Door Assemblies.
    - b. NFPA 252 - Methods of Fire Tests of Door Assemblies.
      - 1) After 5 minutes in the test, the neutral pressure level in furnace shall be established at 40 inches or less above the sill.
    - c. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
    - d. NFPA 101 - Life Safety Code, 2009.
    - e. International Building Code, 2009.
    - f. NFPA 105 - Standard for Installation of Smoke and Draft Control Assemblies.
    - g. ASTM E119 - Standard Method for Testing Construction Assemblies.
    - h. UL 1784: Smoke and draft control air leakage not to exceed 3.0 cu ft / min / sq ft of door opening at 0.10 inch of water for ambient and elevated temperature tests.
  2. All components of a fire-rated assembly (door, glazing, locks, closers, latches, lite frames, louvers, hinges, frames, etc.) shall be rated at or exceed the intended fire protection rating indicated for the assembly.
  3. Fire-rated door frames shall be labeled in accordance with NFPA 80; permanently labeled and listed by UL, Intertek or Warnock Hersey.
    - a. Oversize fire-rated door assemblies: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, provide a certificate and label from an approved independent testing and inspection agency, indicating that the door and frame assembly conforms to the requirements of design, materials, and construction as established by individual listings for tested assemblies.
    - b. If any frame specified by the Architect to be fire-rated cannot qualify for appropriate labeling because of its design, hardware or any other reason, the Architect shall be so advised before proceeding with fabrication.
- E. Fire-Rated Window Assemblies: Comply with NFPA 80. Assemblies shall be identical to assemblies tested per NFPA 257 and shall be listed and labeled by UL, Intertek or Warnock Hersey.
- F. Fire-Rated Door Frame and Window Assembly Ratings: As indicated on Door and Frame Schedule on the Drawings.

**2.03 STEEL FRAMES**

- A. General:
  - 1. Frames for Wood Doors:
    - a. Interior Opening 42 inches and less: 16 gage frames.
    - b. Interior Openings exceeding 42 inches wide: 14 gage frames.
  - 2. Provide minimum 16 gage mortar guard boxes at strike reinforcement in frames for stud partitions. Provide high frequency hinge reinforcement and 12 gauge continuously welded strap reinforcement for continuous hinges.
  - 3. Frames wider than 48 Inches: Reinforce with steel channel, minimum 12 gage, factory welded to the frame head, flush with top. Such stiffeners shall not be used as lintels or load-carrying members.
  - 4. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
- B. Interior Door Frames: Face welded, unless otherwise indicated.
  - 1. Non-Fire-Rated: Fully welded for Level 4 doors.
  - 2. Fire-Rated: Fully welded for Level 4 doors; fire-rating to match door, labeled.
- C. Interior Frames for Glazing (Borrowed Lites): Construction and face dimensions to match door frames, and as indicated on Drawings.
- D. Frame, trim and profiles shall be as scheduled by the Architect and verified by the Contractor. All frame depths shall be coordinated with partition type depths by the Contractor. Frames for drywall partitions shall have 1/2 inch backbends with hooked profile.
- E. Minimum depth of stops shall be 5/8". Use 3/4" only where required for fire rating or security.
- F. When shipping limitations so dictate, frames for large openings shall be fabricated in sections designed for splicing in the field. All splicing locations and details shall be clearly identified on shop drawings and submitted for location review.
- G. Frames for multiple or special openings shall have mullion and/or rail members that are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
- H. Frames shall be provided with supplemental internal concealed steel reinforcement, as engineered by the manufacturer.
- I. Floor Anchors: Securely weld inside each jamb, provide 2 holes at each jamb for floor anchorage. Where required adjustable floor anchors, providing not less than 2" height adjustment, shall be provided. Minimum thickness of floor anchors shall be 14 gage, zinc coated per ASTM A-591.
- J. Stud Partition Jamb Anchors: Shall be steel anchors, compatible with the actual stud used, minimum 18 gage thickness, zinc coated per ASTM A-591 Provide 4 anchors for frames up to 7'-6" high, 5 anchors for frames up to 8'-0" high and 1 additional anchor for each 2'-0" of height over 8'-0".
- K. Frames may be anchored to previously placed structural steel only with the prior approval of the Architect. Such frames shall be provided with anchors and fasteners of suitable design. Provide a minimum of 4 anchors per jamb plus additional anchors in quantities as scheduled above for frames in stud partitions.
- L. Frames for glass walls over-looking area to below shall comply with code-required resistance to loads:
  - 1. Frame shall be rigid and able to withstand a concentrated force of 200 pounds applied at any point and in any direction and, but not simultaneously, a uniform load of 100 pounds per foot applied horizontally against the glass.
    - a. Infill areas of glass shall be rigid and able to withstand a horizontal concentrated force of 200 pounds applied on one square foot at any point in the system including glass panels, frame, or other elements. This loading condition shall not be applied simultaneously with the other loading conditions.

- M. Electrical Raceways: Provide hollow metal doors to receive electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through-wire transfer hardware or wiring harness specified in hardware sets in Section 08 71 00 - Door Hardware and Section 08 74 00 - Access Control Hardware. Wire nut connections are not acceptable.
- N. Electrical Knock-Out Boxes: Factory welded 18 gage electrical knock-out boxes to frame for electrical hardware preps, including but not limited to, electric through wire transfer hardware, electrical raceways and wiring harnesses, door position switches, electric strikes, magnetic locks, and jamb mounted card readers as specified in Section 08 71 00 - Door Hardware and Section 08 74 00 - Access Control Hardware.
  - 1. Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.
  - 2. Conduit to be coordinated and installed in the field under Division 26 from middle hinge box and strike box to door position box.
  - 3. Electrical knock-out boxes shall comply with NFPA requirements and fit electrical door hardware as specified in hardware sets.
  - 4. Electrical knock-out boxes for continuous hinges shall be located in the center of the vertical dimension on the hinge jamb.

#### **2.04 ACOUSTIC RATED FRAME ASSEMBLIES**

- A. Acoustic Door Frames: 14 gauge steel; ANSI/SDI A250.8; mitered and continuously welded; provided with anchors and attachments to transfer loads to surrounding wall construction. Provide high frequency hinge reinforcement. Provide factory welded electrical knock out boxes for electrical hardware where indicated.
- B. Finish: As indicated elsewhere in this Section for metal frames.
- C. Acoustic Seals: Side and head of door and frame shall be provided with two sets of self-aligning magnetic-compression seals to hold door in closed position by the magnetic force of perimeter seals.

#### **2.05 ACCESSORY MATERIALS**

- A. Glazing: As specified in Section 08 80 00 - Glazing, field installed.
- B. Removable Stops: Rectangular, flush set, 18 gage galvanized, primed steel, butted corners; prepared for countersink style tamper proof screws.
- C. Astragals for Double Doors: Steel, shape as required to accomplish fire rating.
- D. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
- E. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- F. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- G. Temporary Frame Spreaders: Provide for all factory or shop-assembled frames.

#### **2.06 FINISH MATERIALS**

- A. Primer: Factory applied, rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
- B. After fabrication, all tool marks and surface imperfections shall be dressed, permanently filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Door frames shall be primed to ensure maximum paint adhesion, on all exposed surfaces with a rust-inhibitive primer in accordance with ANSI A250 - Test Procedure and Acceptance Criteria for Primed Painted Steel Surfaces.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. The Contractor shall take all measurements, make all investigations, and in general, provide field work and coordination as required to ensure the proper fit of all Work specified herein. Frames shall be sized, positioned, and installed in accordance with the design intent represented on the Drawings. The design intent shall not be modified due to the Contractor's failure to provide coordination or obtain properly fabricated materials. Such coordination shall be provided sufficiently in advance so as to avoid delays in the construction schedule.
- B. Verify that opening sizes and tolerances are acceptable. It shall be the responsibility of the Contractor to coordinate frame thicknesses with each wall and partition type to ensure proper fit.

**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 in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. Install fire-rated units in accordance with NFPA 80 and ASTM E119.
- C. Coordinate frame anchor placement with wall construction. Wherever possible, leave frame spreader bars intact until frames are set perfectly square and plumb, and anchors are securely attached. Verify that frames are square and plumb following removal of temporary spreaders.
- D. Coordinate installation of hardware in accordance with hardware manufacturer's templates and instructions. Frames fabricated with hardware cutouts and reinforcing which will not properly accommodate finish hardware shall be rejected and replaced at no additional cost to the Owner.
- E. Coordinate installation of glazing.
- F. Coordinate installation of electrical connections to electrical hardware items.
- G. Immediately after erection, areas where prime coat or galvanizing has been damaged shall be sanded smooth and touch up with same primer or zinc rich rust-inhibitor primer as applied at the factory. Remove rust before touch-up is applied.

**3.04 TOLERANCES**

- A. Clearances Between Door and Frame:
  - 1. Between wood doors and frame, at head and jambs: 1/8" maximum.
  - 2. At doorsills with no threshold: 3/8" (3/4" maximum allowable from finish floor.)
  - 3. At doorsills with threshold: 3/8" maximum between door and threshold.
  - 4. Between meeting edges of pairs of doors: 1/8" maximum.
  - 5. Between face of door and stop: 1/8".
  - 6. Note: Door sills, except at fire-rated doors, shall be undercut greater than the clearances above if so scheduled on the Drawings and/or on the Door & Frame Schedule. Fire-rated doors shall have clearances as specified in NFPA 80.
- B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

**3.05 ADJUSTING**

- A. Adjust for smooth and balanced door movement.
- B. Test sound control doors for force to close, latch, and unlatch; adjust as required to comply.
- C. Contractor shall provide certification for testing of sound control assembly installations as in accordance with ASTM E336. Installed product to perform no less than five ASTC or NIC rating points below the specified laboratory STC rating. Installations that do not meet criteria, to be adjusted and retested until compliance is obtained.

- D. Protect installed doors, frames and accessories against damage from other construction work. Any damage prior to acceptance shall be repaired or replaced, if such action complies with the requirements and shows no evidence of repair or refinishing.

**3.06 SCHEDULE**

- A. Refer to Door and Frame Schedule on the Drawings.

**END OF SECTION**

**SECTION 08 16 14**  
**CLAD WOOD DOORS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Laminate clad interior flush wood doors; flush and flush glazed configuration; fire rated, non-rated.
- B. Acoustic door assemblies including swinging wood doors, frames, seals, thresholds, hardware and additional items required by the sound tested assembly.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 - Hollow Metal Doors and Frames: Door frames.
- B. Section 08 71 00 - Door Hardware: Door hardware.
- C. Section 08 80 00 - Glazing.

**1.03 REFERENCE STANDARDS**

- A. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- B. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems.
- C. NFPA 80 - Standard for Fire Doors and Fire Windows.
- D. NFPA 101 - Life Safety Code.
- E. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.
- F. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics. Submit manufacturer's certification of compliance with quality standards. Submit illustrations and descriptions of all seals and hardware for sound rated door assemblies.
- C. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, finishes, hardware reinforcement, and identify cutouts for glazing.
- D. Test Reports: Submit sound rated door assembly certified laboratory test results indicating a Sound Transmission Class (STC) rating of at least 52, when tested in accordance with ASTM E90 and E413. Submit at least two acoustic field tests showing that comparable installations have been measured in excess of a Noise Isolation Class (NIC) which is not more than four points below the specified STC rating following the procedures set forth in ASTM E 336.
- E. Samples:
  - 1. Selection Samples: Submit complete sets of color chips, illustrating manufacturer's available finishes, colors, and textures.
  - 2. Upon request, submit sample of door construction, 8" x 8" minimum size cut from top corner of door and sample of lite frame section.
  - 3. Samples submitted and accepted shall serve to reflect the entire range of (color, texture, grain and sapwood/heartwood variation and shall be used as the standard for acceptance or rejection of installed materials.
- F. Manufacturer's certification that products are manufactured in the United States or Canada.
- G. Manufacturer's Installation Instructions: Indicate special installation instructions.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer; include detailed terms of warranty.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Protect materials during transit, storage, and handling to prevent deterioration, damage and soiling. Package each door at the factory in a separate heavy sealed poly bag. Mark each bag at top and bottom of doors for location to correspond with opening number on the Drawings.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage. In the event of damage, immediately make all repairs and replacements necessary for approval of the Architect and at no additional cost to the Owner.
- C. Coordinate the work with door opening construction, door frame and door hardware installation. The Contractor shall take all measurements, make all investigations, and in general provide field work and coordination as required to ensure the proper fit of all Work specified herein. Doors and frames shall be sized, positioned and installed in accordance with the design intent represented on the Drawings. The design intent shall not be modified due to the Contractor's failure to provide coordination or obtain properly fabricated materials. Such coordination shall be provided sufficiently in advance so as to avoid delays in the construction schedule.
- D. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
  - 1. Store at temperature and humidity conditions recommended by manufacturer.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten years of documented experience.
- B. Sound Rated Door Assemblies: Sound (acoustic) rated door and frames with appropriate sound seal hardware shall provide required STC rating per ASTM E-90 and E-413 and shall be verified by independent test laboratory certification.
- C. Smoke and Fire Rated Door Assemblies: Conform to the following standards as indicated.
  - 1. UL 10c Pressure Fire Test of Door Assemblies
  - 2. NFPA 252 Methods of Fire Tests of Door Assemblies.
  - 3. NFPA 80 Standard for Fire Doors and Windows.
  - 4. NFPA 101 Life Safety Code.
  - 5. NFPA 105 Standard for Smoke and Draft Control Assemblies.
  - 6. Fire & Smoke/Draft labeled and listed by Underwriters Laboratories or Warnock Hersey.
- D. All components of a fire-rated assembly (door, glazing, locks, closers, latches, lite frames, louvers, hinges, etc.) shall be rated at or exceed the intended fire protection rating indicated for the assembly.
  - 1. Wood doors with fire rating requirements exceeding 20 minutes shall be Category A doors with integral intumescent strips.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Warranty: Manufacturer's lifetime warranty against defective materials or workmanship, warpage and delamination.
- C. Include coverage for delamination of veneer, defective materials, telegraphing core construction, and warping. Unsatisfactory warpage shall be more than 1/4" in a 42" x 84" section and telegraphed core construction shall be defined as exceeding 0.01 inch in a 3 inch span. The warranty shall also include refinishing and reinstalling which may be required due to repair or replacement of defective doors.
- D. For acoustic rated door and frame assemblies provide manufacturer's five year warranty.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: Acrovyn Door Systems by Construction Specialties, Inc. (CSI).



- B. Acceptable Manufacturers:
1. eiDoor System by Eggers Industries.
  2. Thermal Fused Doors by Maiman Company.
  3. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 DOORS

- A. Laminate Clad Flush Wood Doors: Comply with WDMA Standard I.S. 1A, Architectural Wood Flush Doors, Performance Duty Level: Extra Heavy Duty.
1. Door hinge loading resistance - 580 lb. WDMA TM-10 Extra Heavy Duty screw holding capacity - 1,300 lb.
  2. Fire rated doors shall comply with NFPA 80, listed and labeled by F.M / U.L testing agency.
  3. Smoke and Draft Control Doors: S label in accordance with UL 1784 with maximum air leakage of 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure at both ambient and elevated temperatures. If necessary, provide additional gaskets or edge sealing.
  4. Abrasion Resistance: ASTM D4060-90; 28,000 cycles.
  5. Impact Resistance: ASTM D-4226: 86 in/lb.
- B. Door Thickness: 1-3/4 inches, flush construction.
- C. Door Faces: High impact resistant rigid vinyl sheet 0.040 inch thickness.
1. Color / Pattern: To be selected by the Architect from the manufacturer's full color and pattern range.
- D. Glazing Stops, Fire-rated and Non-fire-rated: Manufacturer's standard metal kit for field painting.
- E. Cores: Five-ply, bonded wood door construction. Internal reinforcement for door hardware.
1. Non-fire rated and 20 minute: Solid, bonded FSC certified particleboard grade LD-2, 32 pcf, no added urea formaldehyde content.
  2. 45, 60 and 90 minute fire rated: Solid, bonded, non-combustible mineral composite, 25-32 pcf, no added urea formaldehyde content.
  3. Crossbanding: FSC certified 0.125" tempered hardboard.
- F. Fixed Vertical Stiles:
1. Non-fire rated and 20 minute: 1-3/8" hardwood interior stiles bonded to core.
  2. 45 and 60 minute fire rated: 1-1/2" fixed mineral composite fixed interior stile bonded to core.
- G. Horizontal Edges
1. Non-fire rated and 20 minute: Hardwood.
  2. 45 and 60 minute fire rated: Hardwood/mineral composite bonded to core.
- H. Replaceable Vertical Edges: Match door faces; fully wrapped door edge; no exposed fasteners, 1/4" radius edge, flush with door faces.
1. Adhesives: Urea formaldehyde-free, type as recommended by door manufacturer.
- I. Acoustic Seals:
1. Side and head of door and frame shall be provided with two sets of self-aligning magnetic-compression seals to hold door in closed position by the magnetic force of perimeter seals.
  2. Door Bottom: Bottom of door shall be provided with a continuous, adjustable, teflon coated, neoprene compression seal mortised into the door bottom and designed to compress against floor as door is closed.

## 2.03 COMPONENTS

- A. Frames: As specified in Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Door Hardware: As specified in Section 08 71 00 - Door Hardware.
- C. Glazing: As specified in Section 08 80 00 - Glazing.

- D. Electrical Raceways: Provide concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires for doors receiving electrified hardware. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through wire transfer hardware or wiring harness specified in hardware sets. Wire nut connections are not acceptable. Refer to Sections 08 71 00 through 08 74 00 and Door Schedule.

## **2.04 DOOR FABRICATION**

- A. Factory fit doors to suit frame opening sizes indicated, with the following uniform clearance unless otherwise indicated:
- B. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions. Factory cut lite openings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine all doors before hanging and reject doors with defects.
- B. Verify existing conditions before starting work.
- C. Verify that opening sizes and tolerances are acceptable.
- D. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.
- C. Coordinate installation of doors with installation of frames and hardware. Coordinate installation of glazing.
- D. Separate aluminum and other metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials.
- E. Repair or replace damaged installed products.

### **3.03 TOLERANCES**

- A. Conform to specified quality standard for maximum diagonal distortion.
- B. Edge Clearances shall be provided as follows:
  - 1. Between doors and steel frames at heads and jambs: 1/8" maximum.
  - 2. At door sills without thresholds: 1/2" to top of floor finish.
  - 3. At smoke rated door sills without thresholds: 3/8" max.
  - 4. Between meeting edges of pairs of doors: 1/8" max.Coordinate clearances with door sound and smoke seals in hardware sets.

### **3.04 ADJUSTING**

- A. Adjust doors for smooth and balanced door movement. Align in frames for uniform clearance at each edge. Replace or re-hang any doors which do not swing or operate freely, or are warped or twisted.
- B. Doors damaged prior to acceptance shall be replaced or repaired if the repair shows no evidence of repair
- C. Adjust doors to fit snugly and close without sticking or binding.

### **3.05 SCHEDULE**

- A. Refer to Door and Frame Schedule on the Drawings.

**3.06 PROTECTION**

- A. Protect installed products from damage during subsequent work.

**END OF SECTION**

**SECTION 08 31 00**  
**ACCESS DOORS AND PANELS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wall and ceiling access door and frame units.
- B. It is not intended that the Drawings or Specifications identify specific access door sizes or locations. Subcontractors whose work requires access panels in wall, floor, and ceiling assemblies shall thoroughly examine all Contract Documents and provide suitable access to all equipment, hardware, accessories and all other items that may require adjustment, observation or maintenance. Note: Access doors located in mechanical equipment or ductwork are provided as part of the work of Division 23 - HVAC.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 20 00 - Unit Masonry: Openings in masonry.
- B. Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions and ceilings.
- C. Section 09 90 00 - Painting and Coating: Field paint finish.
- D. Division 22 - Plumbing
- E. Division 23 - HVAC
- F. Division 26 - Electrical

**1.03 REFERENCE STANDARDS**

- A. ITS - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- B. UL - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide materials, construction, profiles, types, finishes, hardware, locking provisions, and details of adjoining work.

**1.05 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.

**PART 2 PRODUCTS****2.01 WALL AND CEILING UNITS**

- A. Manufacturers:
  - 1. Karp Associates, Inc.
  - 2. Milcor.
  - 3. Nystrom Products.
  - 4. Larsens Manufacturing Co.
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Access Doors: Factory fabricated door and frame units, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
  - 1. Material: Steel.
  - 2. Style: Exposed frame with door surface flush with frame surface.
    - a. In Gypsum Board: Use drywall bead type frame.
    - b. In Masonry: Provide adjustable metal masonry anchors.
  - 3. Door Style: Single thickness with rolled or turned in edges.

4. Door Style for fire-rated locations: double wall with integral non-combustible insulation filler.
5. Frames: 16 gage, 0.0598 inch, minimum.
6. Single Thickness Steel Door Panels: 0.070 inch, minimum.
7. Double-Skinned Hollow Steel Door Panels: 16 gage, 0.059 inch, minimum, on both sides and all edges.
8. Steel Finish: Factory prime painted for field finish painting.
9. Sizes: As required for each condition, minimum size 8" x 8". Condition is defined as allowing ample space for access to items that require maintenance and replacement, a worker has to be allowed access with tools and to remove and replace items being accessed.
  - a. Contractor to note all locations and sizes on Coordination Drawings.
10. Hardware:
  - a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
  - b. Latch/Lock: Cylinder lock operated cam latch, two keys for each unit.
  - c. Inside Latch Release: For all doors intended to allow a person to fully pass through, provide Mechanism that allows the panel to be opened from the inside without the use of a tool or key
  - d. Horizontal Applications: Equip with restraints to prevent doors from falling open or closed upon release. All doors greater in size than 300 square inches and installed horizontally shall be provided with the following sign in 1/2" high red letters adjacent to the door lock: "Caution: Door will drop upon lock release".

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that rough openings for door and frame are correctly sized and located.
- B. Door locations that may physically or visually conflict with adjacent construction or building features shall be brought to the attention of the Architect prior to 'roughing-in'. Doors installed in locations objectionable to the Architect shall be removed, patched, and relocated at no additional cost to the Owner.

### **3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings. Secure rigidly in place.
- C. Position units to provide convenient access to the concealed work requiring access.
- D. Adjust hardware and panels after installation for proper operation.
- E. Door lock keys shall be labeled and turned over to the Owner per Project Close-out requirements. All doors shall operate off a Master Key system.

## **END OF SECTION**

**SECTION 08 32 00**  
**SLIDING GLASS DOORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Factory fabricated sliding glazed doors with frames and operating hardware.
- B. Glass and glazing; factory glazed.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 80 00 - Glazing: Product requirements for glass units.

**1.03 REFERENCE STANDARDS**

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, information on glass and glazing, and descriptions of hardware and accessories.
- C. Shop Drawings: Indicate finishes, glazing, grid pattern, handing, opening dimensions, elevations of different types, and framed opening tolerances.
- D. Samples: Submit two samples, 12 x 12 inch in size illustrating typical sliding door panel corner construction, accessories, and finishes.
- E. Certificates: Certify that sliding glass doors meet or exceed specified requirements.
- F. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer and Installer Qualifications: Company specializing in fabrication of commercial sliding doors with a minimum of ten years of experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to project site and store in manufacturer's protective cartons until openings are ready for door installation.
- B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide ten year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Aluminum Sliding Doors:
  - 1. Kawneer; Product 1010 Sliding Mall Fronts.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 SLIDING GLASS DOORS**

- A. Sliding Glass Doors: (Interior applications) Extruded aluminum unit frame and operable panel frame, factory fabricated, factory glazed; complete with integral sloped threshold and anchorage devices.
  - 1. Configuration: Fixed and horizontal sliding panels as indicated on the Drawings.
  - 2. Finish: Color anodized. Color as selected by Architect.
  - 3. Frame Depth: 6 inches, minimum.
  - 4. Aluminum Members: Factory finished; screw lock corner construction.
  - 5. Glass Stops: Same material and color as frame, sloped for wash.
  - 6. Operable Panels: Stainless steel bottom rollers; adjustable.
- B. Construction: Factory assemble door frame as one unit, including head jambs, and sill; factory assemble operating and fixed panels.
  - 1. Sizes: Allow for tolerances of rough framed openings, clearances, and shims around perimeter of assemblies.
  - 2. Joints and Connections: Flush, hairline width, accurately and rigidly joined corners.
  - 3. Sills: Handicap accessible; sloped on both sides; one piece with integral roller track.
- C. Glazing: Insulating glass, Type IG-3 as specified in Section 08 80 00 - Glazing.
- D. Pull Handles: Manufacturer's standard extruded pull.
  - 1. Color: As selected by Architect from manufacturer's standard range.
- E. Lock: Mortised hook lock; cylinder provided in Section 08 71 00
- F. Sliding Panel Bottom Rollers: Stainless steel, adjustable from interior.
- G. Limit Stops: Resilient rubber.
- H. Hook Bolt Lock: Adams Rite 1850A-505. Cylinder: Specified in Section 08 71 00.
- I. Anchors: Hot-dipped galvanized or stainless steel.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on shop drawings.

**3.02 INSTALLATION**

- A. Apply coat of bituminous paint on concealed aluminum surfaces in contact with cementitious or dissimilar materials.
- B. Install door unit assembly in accordance with manufacturer's instructions.
- C. Attach frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- D. Use anchorage devices to securely fasten sliding door assembly to wall construction without distortion or imposed stresses.

**3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation from Plumb: 1/16 inch.
- C. Maximum Variation from Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 foot straight edge.

**3.05 ADJUSTING AND CLEANING**

- A. Adjust hardware for smooth operation.
- B. Remove protective material from factory finished surfaces.



- C. Remove labels and visible markings. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
- D. Protect installed products from damage during subsequent construction activities.

**END OF SECTION**

**SECTION 08 33 13**  
**COILING COUNTER DOORS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Non-fire-rated coiling counter doors and power operating hardware.
- B. Electric motor operation; wiring from electric circuit disconnect to operator to control station.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Curbing and Blocking: Blocking at opening.
- B. Section 05 50 00 - Metal Fabrication: Miscellaneous support framing and framed opening.
- C. Section 08 71 00 - Door Hardware: Cylinder cores and keys.
- D. Section 09 21 16 - GYPSUM BOARD ASSEMBLIES: Rough openings.
- E. Division 26 - Electrical

**1.03 REFERENCE STANDARDS**

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- C. NEMA MG 1 - Motors and Generators; 2014.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
- C. Shop Drawings: Indicate rough and actual opening dimensions, wind load reinforcements, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 4 inch long, illustrating shape, color and finish texture.
- E. Manufacturer's Instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.
- F. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.
- G. Project Record Documents: Include as-built electrical diagrams for electrical operation and connection to fire alarm system.

**1.05 QUALITY ASSURANCE**

- A. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- C. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- D. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.

- B. Store materials in a clean, dry, ventilated, weathertight, secure location.
- C. Protect materials from soiling, abuse, loss and moisture damage.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Project Close-out for warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for electric operating equipment.
- D. Provide two year or 30,000 cycle, whichever occurs first, manufacturer warranty for all non-electrical components.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Coiling Counter Doors (Basis of Design): Model 652 by Overhead Doors, Inc.
  - 1. Cornell Iron Works, Inc
  - 2. The Cookson Company
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 COILING COUNTER DOORS**

- A. Coiling Counter Doors , Non-Fire-Rated: Aluminum slat curtain.
  - 1. Mounting: Face-of-wall mounting.
  - 2. Nominal Slat Size: 1 1/2 inches wide.
  - 3. Finish (Slats & Hood): Clear anodized aluminum.
  - 4. Bottom Bar: Extruded aluminum tubular shape with astragal.
  - 5. Guides: Formed track; same material and finish unless otherwise indicated.
  - 6. Hood Enclosure: Manufacturer's standard ; aluminum.
  - 7. Electric operation: Placement: Located in field as directed by Architect.
  - 8. Locking Devices: Lock and latch handle not required on electric operation.

**2.03 MATERIALS**

- A. Curtain Construction: Interlocking, single thickness slats.
  - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
  - 2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position .
  - 3. Aluminum Slats: ASTM B221, aluminum alloy Type 6063; minimum thickness 0.05 inch.
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
  - 1. Aluminum Guides: Extruded aluminum channel, with wool pile runners along inside.
- C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.
- D. Lock Hardware:
- E. Cylindrical Locking Mechanism: Latchset lock cylinder, specified in Section 08 71 00.
- F. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

**2.04 ELECTRIC OPERATION**

- A. Operator, Controls, Actuators, and Safeties: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction as suitable for the purpose specified and indicated.
  - 1. Provide interlock switches on motor operated units.
- B. Electric Operators:

1. Mounting: Side mounted.
  2. Motor Enclosure: NEMA MG 1.
  3. Motor Rating: As recommended by manufacturer; continuous duty.
  4. Motor Voltage: 24 volt, single phase, 60 Hz.
  5. Opening Speed: 6 inches per second.
  6. Manual override in case of power failure.
- C. Control Station: Standard three button (OPEN-STOP-CLOSE) constant pressure control for each operator.
1. 24 volt circuit.
  2. Surface mounted.
  3. Placement: Located in field as directed by Architect.
- D. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to stop operator upon striking object, hollow neoprene covered.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that opening sizes, tolerances and conditions are acceptable.

#### **3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 26 27 17.
- F. Complete wiring from disconnect to unit components.

#### **3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

#### **3.04 ADJUSTING**

- A. Adjust operating assemblies for smooth and noiseless operation.

#### **3.05 CLEANING**

- A. Clean installed components.
- B. Remove labels and visible markings.

**END OF SECTION**

**SECTION 08 33 26**  
**OVERHEAD COILING GRILLES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Overhead coiling metal grilles and operating hardware, electric operation.
- B. Wiring from electric circuit disconnect to operator to control station.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Curbing and Blocking: Blocking at opening.
- B. Section 08 71 00 - Door Hardware: Cylinder cores and keys.
- C. Section 09 21 16 - Gypsum Board Assemblies: Framed opening.
- D. Division 26 - Electrical.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- B. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000 (R2005), with errata, 2008.
- G. NEMA MG 1 - Motors and Generators; 2014.
- H. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- I. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction, component connections, finish and details, electrical equipment.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit samples of grille members, 8 x 8 inches minimum size, illustrating shape, color and finish.
- E. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures, and special instructions.
- F. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

**1.05 QUALITY ASSURANCE**

- A. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- C. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- D. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Store materials in a clean, dry, ventilated, weathertight, secure location.
- C. Protect materials from soiling, abuse, loss and moisture damage.

#### **1.07 WARRANTY**

- A. See Section 01 78 00 - Project Close-out for warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for electric operating equipment.
- D. Provide two year or 30,000 cycle, whichever occurs first, manufacturer warranty for all non-electrical components.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Overhead Coiling Grilles: (Basis of Design) Model 670 with Auto Release by Overhead Doors, Inc.
  - 1. Cornell Iron Works, Inc
  - 2. The Cookson Company
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.02 GRILLE AND COMPONENTS**

- A. Grille: Aluminum; horizontal bar curtain, coiling on overhead counterbalanced shaft.
  - 1. Size: See Drawings.
  - 2. Finish: Aluminum clear anodized.
  - 3. Electric operation.
  - 4. Mounting: Within framed opening.
- B. Curtain: Round horizontal bars connected with vertical links.
  - 1. Horizontal bars: 5/16 inch diameter.
  - 2. Bar spacing: 2 inch on center.
  - 3. Vertical links: 5/16 inch diameter.
  - 4. Link spacing: 6 inch on center.
  - 5. Bar Ends: Provide with nylon runners for quiet operation.
  - 6. Bottom Bar: Back-to-back angles with tubular resilient cushion.
- C. Guides: Extruded aluminum angles, of profile to retain grille in place with snap-on trim, mounting brackets of same metal.
- D. Hood Enclosure: Sheet metal; completely covering operating mechanisms; internally reinforced to maintain rigidity and shape.
  - 1. Material: Same metal as grille.
- E. Lock Hardware:
  - 1. For motor operated units, additional lock or latching mechanisms are not required.
- F. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

**2.03 MATERIALS**

- A. Aluminum: ASTM B221.

**2.04 ELECTRIC OPERATION**

- A. Electric Operators:
  - 1. Mounting: Side mounted.
  - 2. Motor Enclosure:
    - a. Interior grilles: NEMA MG 1, Type 1; open drip proof.
  - 3. Motor Rating: 1/2 hp; continuous duty.
  - 4. Motor Voltage: 115 volt, single phase, 60 Hz.
  - 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
  - 6. Controller Enclosure: NEMA 250 Type 1.
  - 7. Opening Speed: 12 inches per second.
  - 8. Brake: Adjustable friction clutch type, activated by motor controller.
  - 9. Manual override in case of power failure.
- B. Control Station: Standard three button (OPEN-STOP-CLOSE) constant pressure control for each operator.
  - 1. 24 volt circuit.
  - 2. Surface mounted.
  - 3. Placement: Located in field as directed by Architect.
- C. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to stop operator upon striking object, hollow neoprene covered.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that opening sizes, tolerances and conditions are acceptable.

**3.02 INSTALLATION**

- A. Install grille unit assembly in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 26 27 17.
- F. Complete wiring from disconnect to unit components.

**3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

**3.04 ADJUSTING**

- A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

**3.05 CLEANING**

- A. Clean grille and components.
- B. Remove labels and visible markings.

**END OF SECTION**





**SECTION 08 36 13**  
**OVERHEAD SECTIONAL DOORS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Overhead sectional doors, electrically operated.
- B. Operating hardware and supports.
- C. Electrical controls.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 50 00 - Metal Fabrications: Steel channel opening frame.
- B. Section 06 10 54 - Wood Blocking and Curbing: Blocking.
- C. Section 07 90 05 - Joint Sealers: Perimeter sealant and backup materials.
- D. Section 08 71 00 - Door Hardware: Lock cylinders and associated card access controls.
- E. Division 26 - Electrical.

**1.03 REFERENCE STANDARDS**

- A. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.
- B. ASTM B209 – Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate: 2014.
- C. ASTM B221 – Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wires, Profiles and Tubes: 2014.
- D. NEMA MG 1 – Motors and Generators; 2014
- E. NFPA 70 – National Electrical Code: Current Edition.
- F. UL 325 – Standard for Door, Drapery, Gate, Louver and Window Operators and Systems: Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate wind load reinforcements, opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- C. Product Data: Show component construction, anchorage method, and hardware.
- D. Samples: Submit panel finish samples, 6 x 6 inch in size, illustrating color and finish.
- E. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.
- F. Operation Data: Include normal operation, troubleshooting, and adjusting.
- G. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least five years documented experience.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified.

- D. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Store materials in a clean, dry, ventilated, weathertight, secure location.
- C. Protect materials from soiling, abuse, loss and moisture damage.

#### **1.07 WARRANTY**

- A. See Section 01 78 00 - Project Close-out for warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for electric operating equipment.
- D. Provide two year or 25,000 cycle, whichever occurs first, manufacturer warranty for all non-electrical components.

### **PART 2 PRODUCTS**

#### **2.01 FOLDING OVERHEAD DOORS**

- A. Bi-Fold Doors: Vertically gliding door with no floor tracks.
  - 1. Product: Monarch Sovereign Bi-Fold Door by Renlita Doors North America, LLC.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
    - a. Application: Interior door units.
- B. Performance:
  - 1. Maximum deflection of 1/300 of opening width.
- C. Curtain: Constructed from 2-1/2 inch by 1-1/2 inch (65 mm by 40 mm) top and side rails and 1-1/4 inch by 1-1/2 inch (32 mm by 40 mm) mid rails.
- D. Panels: Panels shall be secured by glazing bead, santoprene or PVC wedges.
  - 1. Panel Heights: Even division of the open height equaling four rows, not to exceed 24 inches per panel height.
  - 2. Glazing Type P-1: 1/4 inch (6 mm) Clear Lexan glazing.
- E. Brackets and Tracks: Mono section configuration.
- F. Side Guides: 5-1/2 inch by 2-3/8 inch (140 mm by 60 mm) extruded aluminum sections with twin 1/8 inch (3 mm) tracks.
- G. Hardware/Hinges: Cast stainless steel constructed hinges with teflon inserts to ensure quiet and low friction operation.
- H. Operation: Door shall be balanced by the use of torsion springs connected to a rotating shaft. The shaft ends are attached to cable drums which lift/lower the curtain via a flexible cable.
  - 1. Electrical with manual override.
- I. Size: As indicated on Drawings.
- J. Locking:
  - 1. Centrally mounted, two way mortise key lock.
  - 2. Integrated motor controlled lock assembly.
- K. Finish: All surfaces except working machine parts shall receive the following factory applied finish.
  - 1. Powder coating.
  - 2. Abrasive clean to SSP-SP6
  - 3. Color: As selected from manufacturer's full range of available colors.
- L. Motors: UL listed, NFPA 70 compliant.
  - 1. Product: Chamberlain Liftmaster Series J Industrial Jackshaft Operator by LiftMaster.

2. Maintenance warning system notifies users when scheduled maintenance is due.
  3. Motor: 1/2 HP switchless motor with the following:
    - a. Power: 115V-60Hz-1 Phase.
  4. Safety:
    - a. Photo eye safety sensors.
    - b. Edge Sensors: Motor reverses if door bottom contacts an obstruction.
  5. Controls: 3-button station with keyed lock out feature providing OPEN/CLOSE/STOP functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
    - a. Location: Side of jamb at location indicated in field by Architect.
- M. Miscellaneous accessories, fasteners, components and equipment for a complete and operational door and door opening system.

## 2.02 SECTIONAL OVERHEAD DOORS

- A. Glazed Aluminum Sectional Overhead Doors:
1. Product: 521 Series Insulated Aluminum Doors by Overhead Door Corporation.
  2. Substitutions: See Section 01 60 00 - Product Requirements.
    - a. Application: Exterior door units.
- B. Performance: Withstand positive and negative wind loads as required per applicable code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
1. Design Pressure: See Structural.
  2. Maximum deflection of 1/300 of opening width.
- C. Door Assembly: Stile and rail assembly secured with 1/4 inch (6 mm) diameter through rods.
1. Panel Thickness: 1-3/4 inches (44 mm).
  2. Center Stile Width: 2-11/16 inches (68 mm)
  3. End Stile Width: 3-5/16 inches (84 mm)
  4. Intermediate Rail Pair Width: 3-11/16 inches (94 mm).
  5. Top Rail Width:
    - a. 3-3/4 inches (95 mm).
  6. Bottom Rail Width:
    - a. 4-1/2 inches (114 mm).
  7. Aluminum Panels: 0.050 inch (1.3 mm) thick, aluminum.
  8. Stiles and Rails: 6063 - T6 aluminum.
    - a. Springs: 50,000 cycles.
  9. Glazing Type IG-5: Tempered. Vision glazing.
    - a. 1/2 inch insulating glazing unit.
    - b. Product: SolarBan 70XL argon filled by Overhead Door Corporation.
  10. Door R-Value: 4.09.
- D. Panels: Panels shall be secured by glazing bead.
1. Panel Heights: Even division of the open height equaling four rows, not to exceed 24 inches per panel height.
- E. Brackets, Guides and Tracks: As recommended by manufacturer to suit loading required and clearances available.
- F. Hardware/Hinges: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
- G. Insulation: Polyurethane, injection formed solid at all rails and stiles.
- H. Weatherstripping:
1. Flexible bulb-type strip at bottom section.
  2. Flexible Jamb seals.
  3. Flexible Header seal.

- I. Operation: Door shall be balanced by the use of torsion springs connected to a rotating shaft. The shaft ends are attached to cable drums which lift/lower the curtain via a flexible cable.
  - 1. Electrical with manual override.
- J. Size: As indicated on Drawings.
- K. Locking:
  - 1. Centrally mounted, two-way mortise key lock.
  - 2. Integrated motor controlled lock assembly.
- L. Finish: All surfaces except working machine parts shall receive the following factory applied finish.
  - 1. Powder coating.
  - 2. Abrasive clean to SSP-SP6
  - 3. Color: As selected from manufacturer's full range of available colors.
- M. Motors: UL listed, NFPA 70 compliant.
  - 1. Product: Chamberlain Liftmaster Series J Industrial Jackshaft Operator by LiftMaster.
  - 2. Maintenance warning system notifies users when scheduled maintenance is due.
  - 3. Motor: 1/2 HP switchless motor with the following:
    - a. Power: 115V-60Hz-1 Phase.
  - 4. Safety:
    - a. Photo eye safety sensors.
    - b. Edge Sensors: Motor reverses if door bottom contacts an obstruction.
  - 5. Controls: 3-button station with keyed lock out feature providing OPEN/CLOSE/STOP functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
    - a. Location: Side of jamb at location indicated in field by Architect.
- N. Miscellaneous accessories, fasteners, components and equipment for a complete and operational door and door opening system.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- B. Verify that electric power is available and of the correct characteristics.

#### **3.02 PREPARATION**

- A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.
  - 1. Application: Exterior door units only.

#### **3.03 INSTALLATION**

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Anchor assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware.
- E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 90 05.

#### **3.04 TOLERANCES**

- A. Maximum Variation from Plumb: 1/16 inch.

- B. Maximum Variation from Level: 1/16 inch.
- C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.
- D. Maintain dimensional tolerances and alignment with adjacent work.

**3.05 ADJUSTING**

- A. Adjust door assembly for smooth operation and full contact with weatherstripping.

**3.06 CLEANING**

- A. Clean doors and frames and glazing.
- B. Remove temporary labels and visible markings.

**3.07 PROTECTION**

- A. Protect installed products from damage until Date of Substantial Completion.
- B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

**END OF SECTION**

**SECTION 08 43 13**  
**ALUMINUM STOREFRONTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Aluminum-framed storefront, glazed.
- B. Exterior and interior vestibule aluminum doors and frames. Weatherstripping and door hardware.
- C. Pre-finished aluminum break-metal trim.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 25 00 - Weather Barriers: Perimeter air and vapor seal between glazing system and adjacent construction.
- B. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.
- C. Section 08 71 00 - Door Hardware: Hardware items other than specified in this Section.
- D. Section 08 44 13 - Glazed Aluminum Curtain Walls.
- E. Section 08 72 00 – Access Control.
- F. Section 08 80 00 - Glazing: Glass and glazing accessories.

**1.03 REFERENCE STANDARDS**

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
- B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- E. ASTM A36 - Standard Specification for Carbon Structural Steel; 2008.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- H. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- I. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).
- J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- K. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Pre-installation Meeting: Conduct a pre-installation meeting at least two weeks before starting work of this Section; require attendance by all affected installers.



**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details and manufacturer's test data.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details.
- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, dimensional limitations.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Samples:
  - 1. Submit selection samples for manufacturer's full color range.
  - 2. Submit confirmation samples minimum 6 x 6 inches in size illustrating selected finished aluminum surface.
  - 3. Upon request, submit fabrication samples 12" long of door framing corner, storefront framing and glazing.
- G. Field Testing: Report of field testing for water leakage.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Maine.
- B. Manufacturer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum fifteen years of documented experience.
- C. Installer's Qualifications: Company specializing in the installation and fabrication of aluminum glazing systems with a minimum of ten years of documented experience and approved by the manufacturer.

**1.07 MOCK-UPS AND SAMPLE INSTALLATIONS**

- A. Sample Installation: Upon the commencement of the storefront framing installation, the first unit, complete with all perimeter flashings and sealants shall be installed at a location as directed by the Architect.
  - 1. Sample installation shall demonstrate actual wall construction, detailing and workmanship.
  - 2. No work shall progress until the Architect has reviewed the sample installation. Installation shall be revised as necessary to secure the Architect's acceptance and shall then become the standard of comparison for all similar units.

**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 78 00 - Closeout Submittals, for additional warranty requirements.

- B. Provide three-year manufacturer's warranty against defects in materials and workmanship in storefront framing and two year manufacturer's warranty against defects in materials and workmanship for entrance doors from date of Substantial Completion.
- C. Provide ten-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 ten-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 STOREFRONT SYSTEM**

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, related flashings, anchorage and attachment devices; field and shop glazed.
  - 1. Glazing Rabbet: For 1 inch insulating glazing.
  - 2. Finish: High performance organic coating, matching curtain wall system.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.
    - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
    - c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
  - 3. 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.
  - 4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
  - 5. 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.
  - 6. 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.
  - 7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
  - 8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
- B. Performance Requirements:
  - 1. General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
    - a. Design wind loads applicable to the Project according to ASCE 7 and IBC 2009.
      - i. Design Wind Speed: 100 mph.
      - ii. Wind Importance Factor  $I_w = 1.15$ .
      - iii. Wind Exposure: C.
      - iv. Wind load design pressures: See structural drawings.
    - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
  - 2. Entrance Air Infiltration, ASTM E283: Maximum of 1.0 cfm per sf door area, at 1.567 psf differential across assembly.
  - 3. Storefront Glazed Panel Air Infiltration, ASTM E283: Maximum of 0.06 cu ft/min/sq ft of wall area at 6.24 psf pressure differential across assembly.
  - 4. Uniform Load Deflection Test, ASTM E330: At static air design load of 20 psf applied positive and negative direction, deflection shall not exceed  $L/175$  of the clear span. At a

- pressure 1.5 times the design wind pressure, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage that would cause the storefront to be defective.
5. Thermal Transmittance, U-factor, AAMA 1503: Overall U-factor not more than 0.31 Btu/(hr sq ft deg F) when glazed with 0.24 center of glass U-Factor.
  6. Condensation Resistance, CRF, AAMA 1503.1: Not less than 57 for frame glazed with 0.24 center of glass U-factor
  7. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 10.00 lbf/sq ft.
  8. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
- C. 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. Outside glazed.
  3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
  4. Size: 2" face x 4-1/2" deep.
  5. Minimum wall thickness: 0.80 inches.
  6. Products:
    - a. Trifab 451UT by Kawneer Company.
    - b. System 403X Dual-Thermal by EFCO.
- D. Glazing: Dry glazed, glazing panels as specified in Section 08 80 00 - Glazing.
1. For Exterior Framing: As indicated on the Drawings.
  2. For Interior Framing: As indicated on the Drawings.
  3. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- E. Swing Doors: Glazed aluminum; 0.124" wall thickness; dual welded corner construction.
1. Thickness: AA425: 2.25 inches; D202: 2 inches.
  2. Top Rail: 2.5 inches wide.
  3. Vertical Stiles: 4.25 inches wide.
  4. Bottom Rail: 10 inches wide.
  5. Mid Rail: 8-1/4"
  6. Glazing Stops: Square.
  7. Finish: Same as storefront.
  8. Products:
    - a. AA425 by Kawneer.
    - b. or Equal by EFCO.

## 2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221, 6063-T6 alloy and temper.
- B. Sheet Aluminum: ASTM B209.
- C. Structural Steel Sections: ASTM A36; galvanized in accordance with requirements of ASTM A123.
- D. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- E. Thermal Barrier:
1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
  2. Barrier material shall be poured-in-place, two-part polyurethane. A nonstructural thermal barrier is unacceptable.

- F. Fasteners: Stainless steel.
- G. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
- G. Perimeter Sealant: Type specified in Section 07 90 05.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- I. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
- J. Pre-finished Aluminum Break-metal Trim and Sill Flashing: 0.032 inch thickness; finish to match storefront. Fasteners shall be fully concealed.

## **2.04 FINISHES**

- A. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
- C. Color: As selected by Architect from manufacturer's custom range.

## **2.05 HARDWARE**

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely -framed entrance doors. For each door, include weatherstripping, sill sweep strip, and threshold. Remainder of hardware shall be specified as part of Section 08 71 00 - Door Hardware.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- D. Threshold: ADA Compliant. 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 wall openings and adjoining air and vapor 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. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- I. Install insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Set thresholds in bed of mastic and secure.
- K. Install hardware using templates provided.

- L. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
- M. Install perimeter sealant in accordance with Section 07 90 05.
- N. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- O. Door installer shall coordinate his work with the Work of Section 08 72 00 and Division 26 - Electrical, for complete concealment of internal raceways in door frames and strikes for security systems.

**3.03 TOLERANCES**

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

**3.04 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.
- B. Test installed storefront for water leakage in accordance with AAMA 501.2.

**3.05 ADJUSTING**

- A. Adjust operating hardware for smooth operation and to be weathertight when closed and locked. Hardware and parts shall be lubricated as necessary.

**3.06 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. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

**3.07 PROTECTION**

- A. Protect installed products from damage during subsequent construction.

**END OF SECTION**

**SECTION 08 44 13**  
**GLAZED ALUMINUM CURTAIN WALLS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Aluminum-framed curtain wall, with vision and spandrel glazing.
- B. Perimeter sealant, weather barrier tie-ins, miscellaneous accessories.
- C. Aluminum breakmetal shapes and trims.
- C. Firestopping between curtain wall and edge of floor slab.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 25 00 - Weather Barriers: Perimeter air and vapor seal between glazing system and adjacent construction.
- B. Section 07 84 00 - Firestopping: Firestop at system junction with structure.
- C. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.
- D. Section 08 43 13 - Aluminum-Framed Storefronts: Entrance framing and doors.
- E. Section 08 80 00 - Glazing.

**1.03 REFERENCE STANDARDS**

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2012.
- B. AAMA 501.1 - Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure; 2005.
- C. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009 (part of AAMA 501).
- D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- F. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2011.
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- I. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2013.
- J. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- K. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2009.
- M. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential; 2009.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Pre-installation Meeting: Conduct a pre-installation meeting at least 2 weeks before starting work of this Section; require attendance by all affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit curtain wall system product data including materials, component dimensions, describe components within assembly, anchorage and fasteners, glazing and infill, 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.
- D. Samples: Submit manufacturer's full color line for selection. Submit confirmation sample on aluminum of selected color. Upon request, submit section of curtain wall framing.
- E. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.
- F. Report of field testing for water leakage.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Maine.
- B. Manufacturer's Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum twenty years of documented experience.
- C. Fabricator / Installer: Company specializing in the work of this Section with a minimum of ten years of documented experience and approved by the manufacturer.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

**1.08 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

**1.09 WARRANTY**

- A. See Section 01 78 10 - Warranties, for additional information.
- B. Provide two year manufacturer's standard limited warranty for curtain wall framing.
- C. Provide ten 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 20 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 CURTAIN WALL SYSTEM**

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, related flashings, anchorage and attachment devices; field glazed.
  - 1. Outside glazed, with pressure plate and mullion cover.
  - 2. Vertical Mullion Dimensions: 2-1/2 inches wide by 7-1/2 inches deep.
  - 3. Finish: High performance organic coating, matching storefront system.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.



- b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
    - c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
  - 4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
  - 5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
  - 6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
  - 7. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and heel bead of glazing compound.
  - 8. 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.
  - 9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
- B. Performance Requirements:
- 1. General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
    - a. Design wind loads applicable to the Project according to ASCE 7 and IBC 2009.
      - i. Design Wind Speed: 100 mph.
      - ii. Wind Importance Factor  $I_w = 1.15$ .
      - iii. Wind Exposure: C.
      - iv. Wind load design pressures: See structural drawings.
  - 2. Structural-Test Performance, ASTM E 330 and TAS 202:
    - a. When tested at positive and negative wind load design pressures, assemblies do not evidence deflection exceeding  $L/175$  of clear span.
    - b. Static air design load of 40 psf, applied in the positive and negative direction, at 150% of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2% percent of clear span. Minimum test duration 10 seconds.
  - 3. Deflection of Framing Members: At design wind pressure, as follows:
    - a. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding  $L/175$  of the glass edge length for each individual glazing lite, or an amount that restricts edge deflection of individual glazing lites to  $3/4$  inch, whichever is less. Limit deflection of clear span of framing members to  $L/175$  for spans less than or equal to  $13'-6"$  and  $L/240 + 1/4"$  for spans greater than  $13'-6"$ .
    - b. Deflection Parallel to Glazing Plane: Limited to  $L/360$  of clear span or  $1/8$  inch, whichever is smaller. and amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than  $1/8$  inch.
    - c. Cantilever Deflection: Where framing members overhang an anchor point, limit deflection to two times the length of cantilevered member, divided by 175.
  - 4. Seismic Story Drift: Accommodate design displacement of adjacent stories indicated.
    - a. Design Displacement: Shall not exceed 1% of story height.

- b. Test Performance: Meeting criteria for passing based on building occupancy type when tested according to AAMA 501.4 at design displacement and 1.5 times the design displacement.
- 5. Water Penetration under Static Pressure, AAMA 501.1 and TAS 202: No evidence of water penetration through fixed glazing and framing areas when tested at 15psf.
- 6. Water Penetration under Dynamic Pressure, AAMA 501.1: No evidence of water penetration through fixed glazing and framing areas at dynamic pressure equal to 15psf). No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior.
- 7. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
  - a. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
  - b. Test Interior Ambient-Air Temperature: 75 deg F.
  - c. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
- 8. Energy Performance: Glazed aluminum curtain walls shall be tested in accordance with NFRC and AAMA Standards.
  - a. Thermal Transmittance, Overall U-value Including Glazing: 0.33 Btu/(hr sq ft deg F), maximum.
  - b. Air Leakage, ASTM E283: Maximum of 0.06 cu ft/min/sq ft of wall area, at 6.24 psf pressure differential across assembly.
  - c. Condensation Resistance, AAMA 1503 (CFR): Factor of Framing: 79, minimum, Factor of Glass: 76.
- C. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  - 1. Glazing System: 4-sided capture.
  - 2. Glazing Plane: Front.
  - 3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
  - 4. Minimum wall thickness: 0.070 inches.
  - 5. Products:
    - a. 1600 UT System 1 by Kawneer Company, Inc.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Glazing and Glazing Accessories: 1" thickness insulating glass panels. See Section 08 80 00.

## 2.06 MATERIALS

- A. Extruded Aluminum: ASTM B221, 6063 T6 alloy and temper.
- B. Sheet Aluminum: ASTM B209.
- C. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- D. Pressure Plate: Aluminum.
- E. Fasteners: Aluminum, non-magnetic stainless steel. Any exposed fasteners shall match curtain wall finish.
- F. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members. Concealed flashings 0.018 inch thick stainless steel.
- G. Brackets and Reinforcements: Manufacturer's standard high strength components.
- H. Framing Sealants: Suitable for glazed aluminum curtain wall as specified and tested by the manufacturer.
- I. Firestopping: As specified in Section 07 84 00.
- J. Perimeter Sealant: As specified in Section 07 90 05.

- K. Thermal Barrier: 1" separation between interior and exterior metal members in a typical position maintaining a continuous water-tight seal. Thermal barrier assembly shall be tested to the thermal cycling requirements of ASTM E2692 and show no sign of degradation following testing.
- L. Pre-finished Aluminum Break-metal Trim and Sill Flashing: ASTM B209; finish shall match storefront. Fasteners shall be fully concealed.
  - a. Sill Flashing: 0.032 inch.
  - b. Head Trim: 0.040 inch.
  - c. Deflection Head: 0.040 inch
  - d. Provide 0.032 inch at other locations unless otherwise indicated.

## **2.07 FINISHES**

- A. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
- B. Color: As selected by Architect from manufacturer's custom range.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

### **3.02 INSTALLATION**

- A. Perimeter Weather Barrier Transition Flashing: Install in backside of glazing pocket to seal window unit to weather barrier system for air and water barrier.
- B. Curtain Wall Framing Installation:
  - 1. Install wall system in accordance with manufacturer's instructions.
  - 2. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
  - 3. Provide alignment attachments and shims to permanently fasten system to building structure.
  - 4. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
  - 5. Provide thermal isolation where components penetrate or disrupt building insulation.
  - 6. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
  - 7. Install firestopping at each floor slab edge.
  - 8. Install foamed-in insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- C. Pressure Plate Framing: Install glazing in accordance with Section 08 80 00, using exterior dry glazing method.
- D. Install perimeter sealant in accordance with Section 07 90 05.
- E. 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 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

**3.04 FIELD QUALITY CONTROL**

- A. Provide the services of the manufacturer's field representative to observe installation and make report.
- B. Test installed curtain wall for water leakage in accordance with AAMA 501.2.
- C. Replace curtain wall components that have failed field testing and retest until performance is satisfactory.

**3.05 ADJUSTING**

- A. Adjust operating sash for smooth operation.

**3.06 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. Take care to remove dirt from corners. Wipe surfaces clean.

**3.07 PROTECTION**

- A. Protect installed products from damage during subsequent construction.

**END OF SECTION**

**SECTION 08 54 13  
FIBERGLASS WINDOWS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Factory fabricated fiberglass windows with fixed sash and factory installed glazing.
- B. Nailing flanges, perimeter sealant, other accessories and hardware required for complete installation.

**1.02 REFERENCE STANDARDS**

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors; 2011.
- B. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- C. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- D. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- E. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2000 (Reapproved 2008)

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Convene at least two weeks before starting work of this Section.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, anchorage and fasteners, glass, internal drainage details, finishes and hardware.
- C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements.
- D. Samples:
  - 1. Submit full range of finishes samples for selection.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years of experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.
- B. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

**1.07 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F.

- B. Maintain this minimum temperature during and after installation of sealants.

### **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for term and additional warranty requirements.
- B. Provide (10) ten-year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of color finish.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Fiberglass Windows:
  - 1. All Ultrex Integrity Windows by Marvin Windows.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 WINDOW UNITS**

- A. Fiberglass Windows: Hollow, tubular, multi-layer fiber reinforced material; factory fabricated; with vision glass, related flashings, anchorage and attachment devices.
  - 1. Performance Requirements: AAMA/WDMA/CSA 101/I.S.2/ A440.
  - 2. Configurations:
    - a. Fixed non-operable: Custom sizes, shapes and mulled unit configurations as indicated per the Drawings.
  - 3. Colors: As selected by Architect from full range.
  - 4. Frames: 3-3/32 inch wide x 1-3/8 inch deep profile.
- B. Performance Requirements:
  - 1. System Design: Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of window.
    - a. Design Wind Speed: 100 mph.
    - b. Wind Importance Factor  $I_w = 1.15$ .
    - c. Wind Exposure: B.
  - 2. Deflection: Limit member deflection to 1/200 of the longer dimension with full recovery of glazing materials.
  - 3. Assembly: To accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.
  - 4. Air Infiltration: Limit air infiltration through assembly to less than 0.3 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.
  - 5. Vapor Seal: No vapor seal failure at interior static pressure of 1 inch, 72 degrees F, and 40 percent relative humidity.
  - 6. Water Leakage: None, when measured in accordance with ASTM E331.
  - 7. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
  - 8. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound. Position thermal insulation on exterior surface of air barrier and vapor retarder.
  - 9. Thermal Movement: Design sections to permit movement caused by thermal expansion and contraction of fiberglass to suit glass, infill, and perimeter opening construction.

### **2.03 COMPONENTS**

- A. Fasteners: Stainless steel.
- B. Glass in Exterior Lights: Factory installed; Low E-366 Type, 11/16" thickness insulating panels, IGCC certified.
- C. Perimeter Sealant and Backing Materials: Type as specified in Section 07 90 05.

D Foam Insulation Sealant: As specified in Section 07 21 00..

## **2.04 FABRICATION**

- A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
- B. Form sills in one piece. Slope sills for wash.
- C. Form snap-in glass stops, closure molds, weather stops, and flashings for tight fit into window frame section.
- D. Form weather stop flange to perimeter of unit.
- E. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- F. Arrange fasteners to be concealed from view.
- G. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
- H. Factory glaze window units.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

### **3.02 INSTALLATION**

- A. Install window units in accordance with manufacturer's instructions.
- B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities. NOTE: Windows shall not come into direct contact with chemically treated wood or asphalt products, including peel and stick flashings.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- D. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- E. Install operating hardware.

### **3.03 FIELD QUALITY CONTROL**

- A. Test installed windows for compliance with performance requirements for water penetration, in accordance with ASTM E1105 (AAMA 502) using uniform pressure and same pressure difference as specified for laboratory tests.
  - 1. Test 5 percent of installed windows.
  - 2. If any window fails, test additional windows at Contractor's expense.
- B. Replace windows that have failed field testing and retest until performance is satisfactory.

### **3.04 CLEANING**

- A. Remove protective material from pre-finished surfaces.
- B. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
- C. Remove excess sealant by moderate use of materials acceptable to window and sealant manufacturer.

**END OF SECTION**



**SECTION 08 62 23  
TUBULAR SKYLIGHTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Tubular skylights, consisting of skylight dome, reflective tube, diffuser assembly and accessories; configuration as indicated on the Drawings.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 – Wood Blocking & Curbing.
- B. Section 07 53 00 - Elastomeric Membrane Roofing: Flashing-in of skylight base.

**1.03 REFERENCE STANDARDS**

- A. ASTM A463 - Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process; 2010.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
- D. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- E. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- F. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including preparation instructions and recommendations, storage and handling requirements and recommendations, installation methods.
  - 1. ICC-ES evaluation report.
- C. Shop Drawings: Submit shop drawings showing layout, profiles, components, anchorage, flashings and accessories.
- D. Test Reports: Independent testing agency reports verifying compliance with specified performance requirements.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Engaged in manufacture of tubular skylights for minimum of 10 years.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

**1.07 FIELD CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Skylights: Manufacturer's standard warranty for 10 years.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Type T1: Solatube International, Inc.; Product: 330 (open and closed ceilings).
- B. Type T2: Solatube International, Inc.; Product: 750 DS-C (open and closed ceilings).
- C. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 TUBULAR SKYLIGHTS**

- A. Tubular Skylights: Transparent roof-mounted skylight dome and curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces.
  - 1. All components made and assembled by one manufacturer.
  - 2. Uniform Load Test, ASTM E330: Design to withstand the following loads without breakage or permanent damage to any parts:
    - a. Live load of positive 150 psf and negative load of 70 psf on dome with a positive safety factor of 3 and a negative safety factor of 2.
  - 3. Hurricane Resistance, ASTM E1886 and ASTM E1996: Passes.
  - 4. Skylights: OSHA Fall Protection Standard 1910.23 and International Building Code roof live load for roof surfaces subject to maintenance workers (1607.1) compliant.
  - 5. Air Infiltration, ASTM E283: Maximum 0.30 cfm per foot of crack length at 1.57 psf pressure differential.
  - 6. Water Resistance, ASTM E331: No uncontrolled water leakage at 10.5 psf pressure differential with water rate of 5 gallons/h/sf, design to ensure that water will not accumulate inside assembly.
  - 7. Thermal Movement: Fabricate to allow for thermal movement resulting from temperature differential from minus 30 to 180 degrees F.
  - 8. Flammability:
    - a. Roof-Top Components: Class B when tested in accordance with ASTM E108 or UL 790.
    - b. Smoke Developed Index, ASTM E84: Maximum of 450.
    - c. Combustibility - Light Transmitting Parts, ASTM D635: Burning extent of 1 inch or less (ICC Class CC-1).
    - d. Combustibility - Non-Light Transmitting Parts, ASATM D635: Minimum 2.5 inches/min (ICC Class CC-2).
- B. Roof Assemblies: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
  - 1. Glazing: Polycarbonate plastic, 0.125 inch minimum thickness.
  - 2. Outer Dome Glazing: Type DA, 0.125 inch minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV A), impact modified acrylic blend.
  - 3. Inner Dome Glazing: Type DPI, 0.115 inch minimum thickness polycarbonate classified as CC1 material.
  - 4. Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
  - 5. Base Material: Sheet steel, aluminized ASTM A463, 0.028 inch thick, minimum.
  - 6. Base Height:
    - a. Type T1: 11 inches, manufacturer standard.
    - b. Type T2: Not Applicable. See drawings.
  - 7. Base Curb Flashing Turret Extension:

- a. Type T1: 12 inches, manufacturer standard.
- b. Type T2: Provide custom insulated curb.
  - 1) Insulation: 2 inch rigid polyisocyanurate, located on inside hollow curb.
  - 2) Provide flashing flanges, nailing curb and profiles as indicated per the drawings.
- 8. Total Curb Height: 24 inches, minimum. See drawings.
- 9. Dome Ring: Attached to top of base section; 0.090 inch nominal thickness injection molded high impact ABS; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing; weather seal of medium density pile weather stripping.
- C. Reflective Tube: ASTM B209, aluminum sheet, thickness between 0.015 inch and 0.020 inch.
  - 1. Interior Finish: Exposed interior surfaces of high reflectance specular finish; specular reflectance 92, total reflectance 95 percent.
  - 2. Tube Diameter: 21 inches.
    - a. Type T1: 21 inches, diameter.
    - b. Type T2: 29 inches, diameter.
- D. Diffuser Assemblies: Supporting light transmitting surface at bottom termination of tube, with compression seal to minimize condensation and bug or dirt infiltration.
  - 1. Ceiling Ring: Edge trim for ceiling opening; injection molded high impact ABS.
  - 2. Diffuser Trim: Edge and attachment trim for diffuser lens; injection molded high impact ABS.
  - 3. Diffuser Shape in Lay-In Ceiling Grid: Square, 24 by 24 inches, to fit grid; metal transition box.
  - 4. Lens: OptiView Diffuser.
  - 5. Seal: Closed cell EPDM foam rubber

### **2.03 ACCESSORIES**

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.
- B. Clamps, rings, extension tubes (straight and offset), suspension kits, miscellaneous components and accessories as recommended by manufacturer for a complete installation assembly.
  - 1. Special Attention: Contractor to include all components necessary in coordination of the tubular skylight placement at roof level in relationship to diffuser placement as a component of the interior ceiling design. Request for additional costs to provide necessary offsets, extensions or other related components and accessories for such coordination will not be accepted.
- C. Joint Sealant: As specified in Section 07 90 05.

## **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 the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's printed instructions.
- B. Seal joints exposed to weather using procedures specified in Section 07 90 05.

- C. Conduct field test for water tightness; conduct water test in presence of Architect. Correct defective work and re-test until satisfactory.

**3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

**SECTION 08 71 00**  
**FINISH HARDWARE, LOW VOLTAGE WIRE AND WIRING**

**PART 1 –GENERAL**

**1.01 RELATED DOCUMENTS**

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

**1.02 DESCRIPTION OF WORK**

- A. The work of this section includes, but is not limited to, the following:
1. Providing hardware for all doors, except doors provided with their own hardware.
  2. Providing lock cylinders for all work requiring cylinders.
  3. Providing the services of a qualified hardware consultant to prepare detailed schedules of hardware required for the project.
  4. Provide all low voltage wiring from lock or exit device to frame header.
  5. Coordinate hardware with Section 08 72 00 card access system.

**1.03 RELATED WORK**

- A. Carefully examine all of the Contract Documents for requirements which affect the work of this section. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
1. Section 08 11 13 – Hollow Metal Doors and Frames; work requiring template coordination, metal astragals for fire-rated doors.
  2. Section 08 16 14 – Clad Wood Doors; work requiring template coordination, metal astragals for fire-rated doors.
  3. Section 08 72 00 – Access Control
  4. Section 08 72 10 – Intercom
  5. Section 08 73 20 – CCTV

**1.04 INTENT**

- A. A major intent of the work of this section is to provide hardware for every door in the project, except as indicated, so that each door functions correctly for its intended use. Provide only hardware that complies with applicable codes and requirements of authorities having jurisdiction including requirements for barrier-free accessibility.

**1.05 QUALITY ASSURANCE**

- A. Hardware supplier shall have in his employ one or more members of the Door and Hardware Institute to include at least one Certified Architectural Hardware Consultant in good standing, who shall be responsible for preparation of the Finish Hardware Schedule. This Consultant shall be acceptable to the Architect and is to ensure that the intent requirement of this specification is fulfilled, and certify that the work of this section meets or exceeds the requirements specified in this section and the requirements of authorities having jurisdiction.
- B. Hardware supplier shall warrant and guarantee, in writing, that hardware supplied is free of defective material and workmanship. Supplier shall further warrant and guarantee for a period of one year from Owner's Use and Occupancy that the hardware shall function in a satisfactory manner without binding, collapse, or dislodging of its parts, provide the installation is made to the manufacturer's recommendations.
- C. The hardware supplier shall repair or remedy, without charge, any defect of workmanship or material for which he is responsible hereunder.

**1.06 SUBMITTALS**

- A. Submit the following in accordance with Section 01 30 00 – Administrative Requirements
  - 1. Schedule: Submit to the Architect six (6) copies of the complete hardware schedule within the fourteen (14) days after receipt of contract award. Submit therewith complete catalog cuts and descriptive data of all products specifically scheduled therein. No materials shall be ordered or templates issued until the hardware schedule has been approved by the Architect. Form and detail of hardware schedule shall be in vertical format in conformance to the door and hardware industry standards. All hardware sets shall be clearly cross-referenced to the hardware set numbers listed in the specifications.
  - 2. Samples: If requested, submit to the Architect for approval, a complete line of samples as directed. Samples shall be plainly marked giving hardware number used in this specification, the manufacturer's numbers, types and sizes. The Architect will deliver approved samples to the project site to be stored. Samples will remain with the Architect until delivery of all hardware to the project is complete, after which time they will be turned over to the General Contractor for incorporation into the work.
  - 3. Keying System Submission: Before cylinders are ordered, submit a complete proposed keying system for approval. This should be done after a keying meeting has been held with the owner's representative.
- B. Close-out Documents:
  - 1. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
  - 2. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
  - 3. Catalog pages for each product, contact information for local representative for each manufacturer.
  - 4. As-installed hardware schedule, as-installed wiring diagrams and final keying schedule.
  - 5. All warranties and certification that electronic security hardware has been inspected and proper operation has been verified.
- C. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 60 00 - Products, for additional provisions.
  - 2. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

**1.07 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Delivery of hardware shall be made to the project by the Hardware Supplier in accordance with the instructions of the General Contractor.
- B. The finish hardware shall be delivered to the jobsite and received there by the General Contractor. The General Contractor shall prepare a locked storage room with adequate shelving, for all hardware. The storage room shall be in a dry, secure area, and shall not include storage of other products by other trades.
- C. The General Contractor shall furnish the Hardware Supplier with receipts for all hardware and accessory items received, and shall send copies of these receipts to the Architect, if requested.

**1.08 REGULATORY REQUIREMENTS**

- A. Conform to all applicable codes. Provide all throws, projections, coatings, knurling, opening and closing forces, and other special functions required by State and Local Building Codes, and all applicable Handicap Code requirements.

- B. For fire rated openings, provide hardware complying with NFPA 80 and NFPA 101 without exception. Provide only hardware tested by UL for the type and size of door installed and fire resistance rating required.

### 1.09 SPECIAL REQUIREMENTS

- A. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.
- B. The Hardware Schedule shall list the actual product series numbers. Bidders are required to follow the manufacturers' catalog requirement for the actual size of door closers, brackets and holders. All door opening sizes are as noted on the Door Schedule and all hardware shall be in strict accordance with requirements of height, width, and thickness.

### 1.10 WARRANTY

- A. See Section 01 78 10 - Warranties, for additional warranty requirements.
- B. All finish hardware shall be warranted against manufacturing defects and faulty workmanship for a period of two years from the date of Substantial Completion, except for the following:
1. Non-electronic door closers shall be warranted for twenty-five years.
  2. Non-electrified exit devices shall be warranted for five years.
  3. Hinges shall be warranted for the life of the building.
  4. Continuous hinges shall be warranted for ten years.
  5. Mortised locks and latches shall be warranted for ten years.
  6. Overhead concealed closers shall be warranted for two years.
  7. Electromechanical door hardware shall be warranted for two years.
- C. The hardware supplier, at his expense, shall adjust, repair, or replace, including labor for installation, any finish hardware supplied under this Section, which is found to be malfunctioning or defective during the above warrantee periods, except due to abuse.

## PART 2 – PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

Hinges	McKinney Stanley	Scranton, PA New Britain, CT
Locksets	Sargent Schlage	New Haven, CT Colorado Springs, CO
Exit Devices	Sargent Von Duprin	New Haven, CT Indianapolis, IN
Door Closers	Sargent LCN	New Haven, CT Princeton, IL
Door Stop	Glynn Johnson Ives Rockwood	Indianapolis, IN New Haven, CT Rockwood, PA
Push/Pulls	Rockwood Burns Ives	Rockwood, PA Erie, PA New Haven, CT



Protective Plates	Rockwood Burns Ives	Rockwood, PA Erie, PA New Haven, CT
Thresholds/ Weatherstripping/ Rain Drips	NGP Pemko Reese	Memphis, TN Memphis, TN Rosemount, MN
Silencers	Ives Glynn Johnson Rockwood	New Haven, CT Indianapolis, IN Rockwood, PA

**2.02 MATERIALS AND QUALITY**

- A. All hardware shall be of the best grade of solid metal entirely free from imperfections manufacturer and finish.
- B. Qualities, weights, and sizes given herein are the minimum that will be accepted. It is the responsibility of the Hardware Supplier to supply the specified size and weight of hardware and the proper function of hardware in each case and to provide UL approved hardware at all fire rated doors.
- C. Provide, as far as possible, locks of one lock manufacturer and hinges of one hinge manufacturer. Modifications to hardware that are necessary to conform to construction shown or specified shall be provided as required for the specified operation and functional features.

**2.03 HARDWARE DESIGNATIONS**

- A. All items of hardware are referenced by manufacturer's names and numbers. The manufacturer's names and numbers are used to define the function, design, and the quality of the material to be supplied.

Substitution of products other than those listed shall be submitted to the Architect at least ten (10) days PRIOR to the bid date. The Architect shall be the sole judge of any proposed substitution. See Section 01 60 00 – Product Requirements.

**2.04 TEMPLATES**

- A. Hardware supplier shall immediately, but not later than three (3) days after approval of his Schedule by the Architect, furnish the General Contractor with complete template information necessary for the fabrication of doors, frames, etc. No templates shall be furnished prior to the approval of the hardware schedule.

**2.05 HARDWARE FOR LABELED FIRE DOORS, EXIT DEVICES AND SMOKE DOORS**

- A. Hardware shall conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Labeling and listing by UL Building Materials Directory, for class of door being used will be accepted as evidence of conformance to these requirements. Install minimum latch throw as specified on label of individual doors. Provide hardware listed by UL except where heavier materials, larger sizes, or better grades are specified herein under paragraph entitled "Hardware Sets". In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements. Specific hardware requirements of door or frame manufacturers which exceed sized or weights of hardware herein listed shall be provided with no additional charge.

**2.06 KEYS AND KEYING**

- A. The hardware supplier shall review the specific hardware functions with the Architect and owner at the time of the keying review, to assure the appropriateness of each of

the hardware functions. Failure to make this review does not relieve the hardware supplier from providing the proper functions.

- B. Key System: All cylinders shall be Masterkeyed and/or Grandmaster Keys: to Furnish six (6) keys for each set.
1. Master keys, Grandmaster Keys: Furnish six (6) keys for each set.
  2. Furnish three (3) change keys for each cylinder keyed differently; six (6) change keys for each set keyed alike, and in sets where only (2) cylinders are keyed alike, four (4) change keys will be required.
  3. All keying is to be done at the factory to avoid duplication of the new cylinders.
  4. Master Keys shall be sent to the Owner by registered mail, return receipt required.
  5. Supply a bitting list for all change keys and master keys to the Owner.
  6. All lock cylinders shall be set to Construction key for use by the Contractor during the construction period. Furnish ten (10) Construction keys and two (2) voiding the Construction key feature.

## **2.07 FASTENERS**

- A. Manufacture hardware to conform to published templates, generally prepared for machine screw installation.
- B. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Furnish exposed screws to match the hardware finish, or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible, except as otherwise indicated.
- C. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed fasteners. Do not use thru-bolts unless specifically approved by the Architect.
- D. All hardware shall be installed only with fasteners supplied by manufacturers of specific products.

## **2.08 PACKING AND MARKING**

- A. All hardware shall have the required screws, bolts and fastenings necessary for proper installation and shall be wrapped in the same package as the hardware item for which it is intended and shall match finish of hardware with which to be used.
- B. Each package shall be clearly labeled indicating the portion of the work for which it is intended.

## **2.09 ENVIROMENTAL CONCERN FOR PACKING**

- A. The hardware shipped to the jobsite is to be packaged in biodegradable packs such as paper or cardboard boxes and wrapping. If non-biodegradable packing such as plastic, plastic bags or large amounts of Styrofoam is utilized, then the Contractor will be responsible for the disposal of the non-biodegradable packing to a licensed or authorized collector for recycling of the non-degradable packing.

## **2.10 FINISH HARDWARE DESCRIPTION**

- A. Hardware items shall conform to respective specifications and standards and to requirements specified herein.
- B. MATERIALS AND FINISH MATERIALS AND FINISHES SHALL BE:
1. Interior Butts: US26D
  2. Door Closers: Sprayed to Match Hardware Finish
  3. Exit Devices: US32D
  4. Kick, Push Plates: US32D
  6. All other hardware shall be: US26D as scheduled.
  7. Continuous Hinges CL
- C. HINGES

1. Number of hinges per door, two hinges for doors up to and including five feet in height and an additional hinge for each two and one half feet or fraction thereof.
2. Hinges shall be as follows:

Exterior	McKinney	TA2314	4 ½ x 4 ½ NRP
	Stanley	FBB191	4 ½ x 4 ½ NRP
Interior	McKinney	TA2714	4 ½ x 4 ½
	Stanley	FBB179	4 ½ x 4 ½
Elec	McKinney	TA2714-QC12	
Continuous Hinges		MCK-12HD (SER-12)	

3. Provide Electro Lynx harnesses and components for wood doors.
4. Provide 15'-0" harness QC-C1500P harness from hinge location up the jamb to above ceiling or up and around full lite wood doors.

D. DOOR CLOSERS:

1. Door closers shall have fully hydraulic, full rack and pinion action. Cylinder body shall be 1-1/2" in diameter, and double heat treated pinion shall be 11/16" in diameter.
2. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and hydraulic back-check.
4. All closers shall have solid forged steel main arms (and forged forearms for parallel arm closers).
5. Closer arms (metal covers) shall have a polished chrome finish (US26).
6. Provide drop, mounting plates, where required.
7. Do not locate closers on the side of doors facing corridors, passageways or similar type areas. Where it is necessary, due to certain conditions and approval of the Architect, to have closers in corridors, provide such closers with parallel or track type arms.
8. All door closers shall be adjusted by the installer in accordance with the manufacturer's templates and written instructions. Closers with parallel arms shall have back-check features adjusted prior to installation.
9. Closers shall conform to all applicable code requirements relative to setting closing speeds for closers and maximum pressure for operating interior and exterior doors.
10. Door closers meeting this specification are as follows:

	LCN	Sargent
Exterior	4111S-CUSH	281 – CPS
	4111S-H-CUSH	281 – CPSH
Interior	4011	281- 0
	4111	281 – P10
	4040SE	2407 Series
	4000T	281 – OT x spec. TEMP.

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FINISH HARDWARE, LOW VOLTAGE WIRE AND WIRING

4310ME-SF	2980
4040SE-DE	2477

**E. EXIT DEVICES:**

1. Shall be Sargent as follows or equal by Von Duprin:

Function	Sargent
A	16-8804
B	8810
C	12 55 8876-12V ETMD
D	55 8810
E	12-8804 ETMD
F	12-8813 ETMD
G	12-8815 ETMD
H	12 56 8804 ETMD
I	12 55 NB 8710
J	12 55 NB 8774-24V ETMD
K	55 56 NB 8713 ETMD
L	49-12-8816 ETMD
M	12-NB 8713 ETMD
N	CD8710 x 306
O	12-8713 ETMD
P	12-8715 ETMD
Q	12-PP/PR8710
R	12-NB8715 ETMD
S	12-55 56 NB 8713 ETMD
T	12-55 NB 8710
U	55 56-12 8813 ETMD
V	55 56 8710 x 306 CONTROL
W	55 56 8710
X	55 56 8804
Y	55 56 8810

NOTE: Lever design shall match lock trim

**F. MORTISE LEVER HANDLE LOCKSETS STUDIO COLLECTION:**

1. Locksets for this project shall be mortise type with solid cast stainless steel lever handle sectional trim.
2. The lockset case shall be 12 gauge heavy duty wrought steel with zinc dichromate finish.
3. Locksets shall have a simple reversibility of the hand by utilizing a screwdriver without disassembly of the lock case.
4. Latchbolt shall be a stainless steel 3/4" one-piece, anti-friction and reversible.
5. Strikes shall be non-handed curved lip stainless steel ANSI Standard A115.1, 4 7/8" x 1 1/4".
6. Locks and cylinders shall be manufactured and supplied by the same manufacturers. All locksets and cylinders for this project shall be manufactured in the United States of America by a recognized and reputable lock manufacturer.

7. The following is a guide to the manufacturers and designs acceptable for this project. Sargent 8200 Series LNMD.
8. Lock functions as indicated in the hardware schedule shall be as follows:

Function	Sargent
A(Storeroom)	04
B(Storeroom) Tactile Warning	04
C(Office)	05
D(Passage)	15
E(Vestibule)	16
F(Classroom)	37
G(Office)	25
H(Privacy)	65
I(Spec Classroom)	49-38
J(Elec Lock)	IDP NAC 82271-24V LNMD
K(Elec Lock)	RX71
L(Privacy)	49-66 (185P)
M(Deadlock)	4877

G. PUSH PLATES, DOOR PULLS, PUSH/PULL BARS:

1. Shall be as manufactured by Rockwood, Burns or Ives.
  - a. Push plates shall be 4" x 16" x .050 thickness unless otherwise listed in hardware sets.

Rockwood	70 Series
Burns	50 Series
Quality	40 Series

- b. Door pulls shall be 1" x 10"

Type A

Rockwood	BF157
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H. KICK PLATES, ARMOR PLATES, MOP PLATES:

1. Kick plates shall be 8 in. high. Armor plates shall be 34 in. high. Mop plates shall be 4 in. high. All plates shall be 2 in. less the width of door. Plates shall be .050 thickness, bevel 4 edges, screws shall be oval head counter-sunk.

I. STOPS

1. Shall be furnished at all doors. Wherever and opened door or any item of hardware thereon strikes a wall, at 90 degrees. Provide wall bumpers, unless otherwise indicated in hardware sets.
2. Where wall bumpers cannot be effectively used, a floor stop shall be furnished and installed.
3. Provide roller bumpers for each door where two doors interfere with each other in swinging.

Manufacturer	Wall Bumpers	Floor Stops	Roller Bumpers
Rockwood	409	440, 442	456
Ives	407 ½	436B, 438B	470 Series

Glynn Johnson

WB 50XT

FB13, FB14

RB-3

4. Where overhead stops are listed they shall be the surface mounted type as follows:

Manufacturer	Series
Sargent	1540

J. THRESHOLDS, WEATHERSTRIP, SEAL:

- Thresholds shall be as detailed and furnished on all doors where shown on drawings. Thresholds shall be aluminum unless otherwise indicated. Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Section 07 90 05 - Joint Sealers.
- Weatherstripping shall be furnished on all exterior doors unless otherwise indicated.

Product	Pemko	NGP
Threshold	as detailed	
Brush Seal	45062AP	A626A
Auto. Door	430CR	420
Bottom		
Door Sweep	345AV	101AV
Set Astragals	351C x 351CP	140 x 140P
Astragal	357SP	139SP
Rain Drip	346C	16A
Sound Seals	319	134N

3. Smoke Seals

Jamb Seals	S88D	5050 CL
Astragal Seals	S77C	5070 CI

K. FLUSH BOLTS:

- Shall be self-latching or automatic type at label doors, manual flush bolts at non-label doors.

		Glynn Johnson	Door Controls	Rockwood
Manual	HM	FB6	780	555
	WD	FB6W	790	557
Self Latching	HM	FB51P	845	1845
	WD	FB61P	945	1945
Automatic	HM	FB31P	842	1842
	WD	FB41P	942	1942
Coordinator			600	1600

- L. LOW ENERGY OPERATOR:
  - 1. Provide Horton 4100 low energy operator. Push button actuators to be hard wired.
  - 2. Provide MC-25 interface switch.
  - 3. Provide exterior pedestal for push button controls as required model #10BOLLARDBLK.
- M. POCKET FRAME:
  - 1. Provide pocket frame equal to Stanley model #PDFC150N
  - 2. Provide surface pulls equal to Rockwood model #106
- N. FLOOR CLOSERS:
  - 1. Equal to Rixson model #40
  - 2. Provide top pivot model #340

**2.11 KEY CONTROL SYSTEM**

- A. Provide a key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of the number of locks required for the Project.
  - 1. Provide complete cross index system set up by the hardware supplier, and place keys on markers and hooks in the cabinet as determined by the final key schedule.
  - 2. Provide hinged-panel type cabinet for wall mounting.

**2.12 FIRE DEPARTMENT LOCK BOX**

- A. Supplier to submit product data to Fire Department for approval. Submit AHJ written approval to Architect for record.
- B. Verify final location and position in field with Rockland Fire Department and the Architect prior to installation.
- C. Fire Department Secure Exterior Key Box:
  - 1. Key Boxes: Two locations, exterior mounted, U.L. Listed, black, fully recessed, 4"H x 5"W x 3- 3/4" D, high security key box. Provide key box tamper switch connected to fire alarm, wiring provided by the Electric Contractor.
    - a. Product: Knox-Box 3271 Series by Knox. No Substitutions.
- D. Keys: Supply a minimum of (10) ten Master Keys.
  - a. Key Delivery: All change keys, masters and grandmaster keys shall be shipped directly from the factory to the Owner, registered mail, confidential.

**PART 3—EXECUTION****3.01. INSPECTION**

- A. It shall be the general contractors responsibility to inspect all doors openings and doors to determine that each door and door frame has been properly prepared for the required hardware. If errors in dimensions or preparation are encountered, they are to be corrected by the responsible parties prior to the installation of hardware.

**3.02 PREPARATION**

- A. All doors and frames, requiring field preparation for finish hardware, shall be carefully mortised, drilled for pilot holes, or tapped for machine screws for all items of finish hardware in accordance with the manufacturers templates and instructions.

**3.03 INSTALLATION/ADJUSTMENT/LOCATION**

- A. All materials shall be installed in a workmanlike manner following the manufacture's recommended instructions.



- B. Exit Devices shall be carefully installed so as to permit friction free operation of crossbar, touch bar, lever. Latching mechanism shall also operate freely without friction or binding.
- C. Door Closers shall be installed in accordance with the manufacturer's instructions. Each door closer shall be carefully installed, on each door, at the degree of opening indicated on the hardware schedule. Arm position shall be shown on the instruction sheets and required by the finish hardware schedule.
- D. The adjustments for all door closers shall be the installer's responsibility and these adjustments shall be made at the time of installation of the door closer. The closing speed and the latching speed valves, shall be adjusted individually to provide a smooth, continuous closing action without slamming. The delayed action feature or back check valve shall also be adjusted so as to permit the correct delayed action cycle or hydraulic back check valve shall also be adjusted so as the opening cycle. All valves must be properly adjusted at the time of installation. Each door closer has adjustable spring power capable of being adjusted, in the field from size 2 thru 6. It shall be the installers' responsibility to adjust the spring power for each door closer in exact accordance with the spring power adjustment chart illustrated in the door closer installation sheet packed with each door closed.
- E. Installation of all other hardware, including locksets, push-pull latches, overhead holders, door stops, plates and other items, shall be carefully coordinated with the hardware schedule and the manufacturer's instruction sheets.
- F. Locations for finish hardware shall be in accordance with dimensions listed in the pamphlet "Recommended locations for Builders' Hardware" published by the Door and Hardware Institute.

#### **3.04 FIELD QUALITY CONTROL**

- A. Upon completion of the installation of the finish hardware, it shall be the responsibility of the finish hardware supplier to visit the project and to examine the hardware for each door on which he has provided hardware and to verify that all hardware is in proper working order. Should he find items of hardware not operating problem he should make a report, in writing, to the general contractor, advising him of the problem and the measures required to correct the problem.

#### **3.05 PROTECTION**

- A. All exposed portions of finish hardware shall be carefully protected, by use of cloth, adhesive backed paper or other materials, immediately after installation of the hardware item on the door. The finish shall remain protected until completion of the project. Prior to acceptance of the project by the Architect and owner, the general contractor shall remove the protective material exposing the finish hardware.

#### **3.06 CLEANING**

- A. It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

#### **3.07 INSTRUCTIONS AND TOOLS**

- A. It shall be the responsibility of the finish hardware supplier to provide installation and repair manuals and adjusting tools, wrenches, etc... for the following operating products.
  - 1. Locksets (all types)
  - 2. Exit Devices (all types)
  - 3. Door Closers

**3.08 HARDWARE SETS**

- A. Each Hardware Set listed below represents the complete hardware requirements for one opening. (Single Door or Pair of Doors). Furnish the quantities required for each set for the work.

HW 1

Doors #120B

Each Leaf Shall Have: Continuous Hinges, Exit Device (Function B, B), Door Closer (Cush N Stop Arm), Removable Mullion, Threshold, Drop Plate  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 2

Doors #ST4.1A

Each Leaf Shall Have: Continuous Hinges (SER-12), Electro Lynx Harness Door and Frame, Exit Device (Function X, Y), Removable Mullion, Door Closers (Cush N Stop Arm), Threshold, Cylinders, Drop Plate, Pulls  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 3

Door #107

Each Leaf Shall Have: Continuous Hinge (SER-12), Electro Lynx Harness Door and Frame, Lockset (Function J), Door Closer (Cush N Stop Arm), Kick Plates, Cylinders, Threshold, Drop Plate  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 4

Door #118B

Each Leaf Shall Have: Continuous Hinge, Exit Device (Function A), Door Closer (Cush N Stop Arm), Kick Plate, Threshold, Cylinder, Drop Plate, Pulls  
(Balance of Hardware by Aluminum Door Supplier)

HW 5

Doors #140C, 150C, 160C, 170C, ST3.1B

Each Leaf Shall Have: Continuous Hinge, Exit Device (Function B), Door Closer (Cush n Stop Arm), Kick Plate, Threshold, Drop Plate  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 6

Doors #135B

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Lockset (Function J), Door Closer (Cush N Stop Arm), Kick Plate, Threshold, Drop Plate  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 7

Doors #100B, ST2.1, ST2.1A, ST2.1B

Each Leaf Shall Have: Hinges, Exit Device (Function R, R), Door Closers, Kick Plate, Door Stops

HW 8

Doors #121A, 121B, 180A

Each Leaf Shall Have: Hinges, Exit Device (Function M, M), Door Closers, Kick Plates, Sound Weatherstrip, Auto Door Bottoms, Astragals, Door Stops, Cylinders

HW 9

Doors #100Ac

Each Leaf Shall Have: Hinges, (2) Electric Hinges, Electro Lynx Harness Door and Frame, Exit Device (Function K, K), Door Closers, Kick Plates, Gasketing, Astragal, Cylinders  
(Balance of Hardware Section 08720)

HW 9A

Doors #100Db, 100Da

Each Leaf Shall Have: Continuous Hinges (SER-12), Electro Lynx Harness Door and Frame, Removable Mullion, Exit Device (Function X, Y), Pulls, Door Closers (Cush N Stop Arm), Kick Plates, Threshold, Cylinders, Drop Plates  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 9B

Doors #241B

Each Leaf Shall Have: Hinges, Lockset (Function I), Door Closers, Kick Plates, Door Stops

HW 9.1

Doors #288

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Exit Device (Function U), Door Closers, Kick Plates, Door Stops, Cylinders  
(Balance of Hardware Section 08720)

HW 9.2

Doors #241A

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Lockset (Function J), Auto Flush Bolts, Coordinator, Door Closers, Kick Plates, Gasketing, Astragal, Cylinder  
(Balance of Hardware Section 08720)

HW 10

Doors #100Aa, 100Ab

Each Leaf Shall Have: Continuous Hinges (SER-12), Electro Lynx Harness Door and Frame, Exit Devices (Function X, Y), Pulls, Auto Operator (Active Leaf), Door Closer, Removable Mullion, Cylinders, Drop Plates  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 11

Doors #100D

Each Leaf Shall Have: Hinges, (2) Electric Hinges, Electro Lynx Harness Door and Frame, Exit Device (Function T, T), Door Closers, Kick Plates, Door Stops, Cylinders, Sound Seals, Auto Door Bottoms, Set Astragals  
(Balance of Hardware Section 08720)

HW 12

Doors #101Ba, 101Bb

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Lockset (Function J), Door Closer, Kick Plates, Smoke Gaskets, Door Stops, Cylinders  
(Balance of Hardware Section 08720)

HW 13

Doors #142, 143, 152, 161, 182, 190B, 123, 286

Each Leaf Shall Have: Hinges, Lockset (Function I), Flush Bolts, Door Closers, Kick Plates, Door Stops

HW 14

Doors #151A, 192

Each Leaf Shall Have: Hinges, Lockset (Function A), Flush Bolts, Door Closers, Kick Plates, Door Stops

HW 14A

Doors #191

Each Leaf Shall Have: Hinges, Lockset (Function A), Flush Bolts, Door Closer, Kick Plates, Door Stops, Sound Seals, Auto Door Bottoms, Astragal

HW 15

Doors #117B

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Lockset (Function J), Door Closers, Auto Flush Bolts, Coordinator, Kick Plates, Door Stops  
(Balance of Hardware Section 08720)

HW 16

Doors #100F, ST3.1A

Each Leaf Shall Have: Hinges, Exit Device (Function G), Door Closer, Kick Plate, Door Stop

HW 17

Doors #118A

Each Leaf Shall Have: Hinges, Exit Device (Function E), Door Closer, Kick Plate, Door Stop, Pulls, Cylinders

HW 18

Doors #150A, 160A, 170A, 180B, 110, 130, 140A, 120A

Each Leaf Shall Have: Hinges, Lockset (Function I), Door Closer, Kick Plate, Door Stop, Cylinders

HW 19

Not Used

HW 20

Doors #ST4.2

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Exit Device (Function U), Door Closer, Kick Plate, Smoke Gasketing, Door Stop, Cylinders  
(Balance of Hardware Section 08720)

HW 21

Doors #101Bc, 102B, 270

Each Leaf Shall Have: Hinges, (1) Electric Hinge, Electro Lynx Harness Door and Frame, Lockset (Function J), Door Closer, Kick Plate, Smoke Gasketing, Door Stop  
(Balance of Hardware Section 08720)

HW 22

Doors #201, 208A, 208B

Each Leaf Shall Have: Hinges, Lockset (Function I), Flush Bolts, Door Stops

HW 23

Doors #131, 190A, 193, 209A, 230, 171, 112A, 135A, 290, 196B, 196A, 210, 250A, 250B, 250C, 260A, 261A, 281, 282A, 284, 285, 292

Each Leaf Shall Have: Hinges, Lockset (Function I), Door Closer, Kick Plate, Smoke Gasketing, Door Stop

HW 24

Doors #107A, 119, 133, 117A, 116, 144, 151B, 170B, 172, 141A, 195, 233, 283A, 283B, 180C, 265, 263, 264, 232B

Each Leaf Shall Have: Hinges, Lockset (Function A), Door Closer, Kick Plate, Door Stop

HW 24A

Doors #234C

Each Leaf Shall Have: Hinges, Lockset (Function A), Door Closer, Kick Plate, Sound Seals, Auto Door Bottom, Door Stop

HW 25

Doors #204A, 204B, 205A, 205B, 220, 221, 282B

Each Leaf Shall Have: Hinges, Lockset (Function F), Door Stop

HW 25A

Door #ST3.1C

Each Leaf Shall Have: Hinges, Exit Device (Function G), Door Closer, Kick Plate, Smoke Gasketing, Door Stop

HW 26

Doors #106A, 106B

Each Leaf Shall Have: Hinges, Lockset (Function L), Door Closer, Smoke Gasketing, Door Stop

HW 27

Doors #262, 260B, 261B, 232A

Each Leaf Shall Have: Hinges, Lockset (Function F), Door Stop

HW 27A

Doors #234A

Each Leaf Shall Have: Hinges, Lockset (Function F), Sound Seals, Auto Door Bottom, Door Stop

HW 28

Doors #102a, 103, 104, 105, 114, 115, 137, 136, 181, 183, 202, 223, 209B, 231, 291A, 291B, 271, 272, 273, 274

Each Leaf Shall Have: Hinges, Lockset (Function C), Door Stop

HW 29

Doors #234B

Each Leaf Shall Have: Heavy Weight Hinges, Lockset (Function D), Auto Flush Bolts, Coordinator, Door Closers, Kick Plates, Sound Weatherstrip, Auto Door Bottoms, Astragals, Door Stops

HW 30

Doors #107B

Each Leaf Shall Have: Continuous Hinge, Continuous Hinge (SER-12), Lockset (Function J), Door Closer (Cush N Stop Arm), Flush Bolts, Threshold, Armor Plates  
(Balance of Hardware by Aluminum Door Supplier and Section 08720)

HW 31

Doors #203

Each Leaf Shall Have: Hinges, Lockset (Function D), Flush Bolts, Door Stops

HW 32

Doors #201A, 210A, 207, 138, 113

Each Leaf Shall Have: Hinges, Lockset (Function H), Door Stop

HW 33

Doors #206, 109A, 109B

Each Leaf Shall Have: Hinges, Push Plate, Pull, Door Closer, Kick Plate, Door Stop

HW 34

Doors #222A, 222B

Each Leaf Shall Have: Floor Closer, Pivots, Push Plates, Kick Plates (Both Sides), Flush Bolts, Deadlock (Function M)

HW 35

Door #104A

Each Leaf Shall Have: Hinges, Lockset (Function A), Door Stop

HW 36

Doors #108

Each Leaf Shall Have: Hinges, Lockset (Function F), Door Closer, Kick Plate, Door Stop

HW 37

Doors #110A, 180D, 141B, 122

Each Leaf Shall Have: Hinges, Lockset (Function A), Flush Bolts, Door Stops

HW 38

Door #132

Each Leaf Shall Have: Heavy Weight Hinges, Lockset (Function A), Flush Bolts, Door Stops

HW 39

Doors #108A, 108B, 100Fb, 150B, 160B, 140B, 100Eb

Each Leaf Shall Have: Cylinders to Suit Lock

HW 40

Doors #110B, 108B, 100Fa, 170D, 100Ea, 130A, 130B, 110C

Each Leaf Shall Have: Cylinders to Suit Lock, Card Readers  
(Balance of Hardware Section 08720)

HW 41

Doors #251, 260C

Each Leaf Shall Have: All Hardware by Door Supplier

**END OF SECTION**



**SECTION 08 72 00  
ACCESS CONTROL****PART 1 –GENERAL****1.01 RELATED DOCUMENTS**

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

**1.02 DESCRIPTION OF WORK**

- A. The work of this section includes, but is not limited to, the following:
  - 1. Providing electronic hardware for doors with access control.
  - 2. Providing wiring to all electronic access control devices.
  - 3. Providing controllers and all control hardware for access control.
  - 4. Providing configuration and training on access control system.

**1.03 RELATED WORK**

- A. Carefully examine all of the Contract Documents for requirements which affect the work of this section. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
  - 1. Section 08 71 00 – Door Hardware
  - 2. Section 08 72 10 – Intercom
  - 3. Section 08 72 20 – CCTV

**1.04 INTENT**

- A. A major intent of the work of this section is to provide a system to control access to areas by time, personnel, or other factors via software configuration.

**1.05 QUALITY ASSURANCE**

- A. Access Control supplier shall be fully licensed and competent in systems install and service.
- B. Access Control supplier shall warrant and guarantee, in writing, that hardware supplied is free of defective material and workmanship. Supplier shall further warrant and guarantee for a period of one year from Owner's Use and Occupancy that the hardware shall function in a satisfactory manner without binding, collapse, or dislodging of its parts, provide the installation is made to the manufacturer's recommendations.
- C. The Access Control supplier shall repair or remedy, without charge, any defect of workmanship or material for which he is responsible hereunder.

**1.06 SUBMITTALS**

- A. Submit the following in accordance with Section 01 30 00 – Administrative Requirements.
  - 1. Samples: If requested, submit to the Architect for approval, a complete line of samples as directed. Samples shall be plainly marked, the manufacturer's numbers, types and sizes.
  - 2. Submit names of technicians, relevant certifications, licenses and years of experience who may be assigned to this project.
  - 3. Submit on-going license, hosting, monitoring and any other fees incurred for normal use of this system as designed.

**PART 2 – PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

Controllers	Mercury	Long Beach, CA
Software Package	RS2 Feenics Vanderbilt Industries	Munster, IN Ontario, Canada Parsippany, NJ
Power Supplies	Life Safety Altronix	Mundelein, IL Brooklyn, NY
Card Readers	HID Farpointe	Austin, TX Sunnyvale, CA
Request to Exit	Bosch Honeywell	Stuttgart, Germany Morris Plains, NJ
Door Position Sensors	GE Honeywell GRI	Boston, MA Morris Plains, NJ Kimball, NE
Card Style Credentials	HID Farpointe	Austin, TX Sunnyvale, CA
Panic Button	Interlogix Safety Technology Securitron	Jupiter, FL Waterford, MI Phoenix, AZ
Siren	Honeywell Elk Amseco / Potter	Morris Plains, NJ Hildenbran, NC Mansfield, TX
Garage Door Wireless	Liftmaster	Oak Brook, IL

**2.02 MATERIALS AND QUALITY**

- A. All products shall be of the best grade entirely free from imperfections manufacturer and finish.
- B. Provide, as far as possible, devices of one manufacturer. Modifications to devices that are necessary to conform to construction shown or specified shall be provided as required for the specified operation and functional features.

**2.03 MINIMUM REQUIREMENTS**

- A. CONTROLLERS
  - a. Controllers shall be Mercury hardware; no substitutions will be accepted without substitution request form submission prior to bid date. System shall

- be BACnet open protocol, allowing modifications and support by multiple manufacturers.
- b. Controllers shall be wall mounted in IT office Room 261
- c. Controller shall interface with Dialer capable of signaling Central Station
- B. SOFTWARE PACKAGE
  - a. Software Package shall be compatible with Mercury Hardware
  - b. Software shall have capacity for 25% additional openings
  - c. Software shall have capacity for 2500 card holders
  - d. Software shall be capable of 10 concurrent users
  - e. Software shall be capable of sending email notifications
  - f. Software shall be capable of CCTV integration
  - g. Software shall have a configurable 'Lockdown' feature
- C. POWER SUPPLIES
  - a. Power Supplies shall be sufficient for 25% expansion
  - b. Power Supplies shall be contained within UL Rated Cabinet
  - c. Power Supplies shall be monitored by Access Control System for trouble conditions
- D. CARD READERS
  - a. Card Readers shall be 26bit Wiegand format
  - b. Card Readers shall mount to a 1-gang box and cover box from view
  - c. Card Readers mounted to mullion frames shall not be wider than mullion
  - d. Card Readers shall be consistent in color and finish
- E. REQUEST TO EXIT
  - a. REX shall be compatible with Mercury hardware and selected software
- F. DOOR POSITION SENSOR
  - a. DPS shall be compatible with Mercury hardware and selected software
  - b. DPS shall be  $\frac{3}{4}$ " recessed style
- G. CARD STYLE CREDENTIALS
  - a. Cards shall be compatible with selected card readers
  - b. Cards shall be plain white cards capable of badge printing
- H. PANIC BUTTON
  - a. Panic button shall require two actions to engage
  - b. Panic button shall remain in locked position after engaged
  - c. Panic button shall have two separate relay contacts
    - i. One will transmit to dialer
    - ii. One will transmit to Access Control System
- I. SIREN
  - a. Siren shall be powered from Mercury Hardware outputs
  - b. Siren shall mount to 1-gang box and cover box from view
  - c. System shall be set-up for silent alarm features
- J. GARAGE DOOR WIRELESS
  - a. Garage door wireless openers shall transmit wig and data to access control.
  - b. Garage door openers shall be configurable for use during certain hours and only upon activation of card access.
  - c. Garage door openers shall save audit data within access control

### **PART 3—EXECUTION**

#### **3.01. INSPECTION**

- A. It shall be the general contractor's responsibility to inspect all devices for proper function and installation.

**3.02 INSTALLATION/ADJUSTMENT/LOCATION**

- A. All materials shall be installed in a workmanlike manner following the manufacturer's recommended instructions.
- B. The adjustments for all equipment shall be the installer's responsibility and these adjustments shall be made at the time of installation.
- C. No wiring shall be exposed or visible at door locations.
- D. All wiring leaving the building shall be rated for direct burial.

**3.03 FIELD QUALITY CONTROL**

- A. Upon completion of the installation of the system, it shall be the responsibility of the Access Control supplier to visit the project and to examine the system for each view on which he has provided camera view and to verify that all devices are in proper working order. Should he find items not operating properly he should make a report, in writing, to the general contractor, advising him of the problem and the measures required to correct the problem.

**3.04 CLEANING**

- A. It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

**3.05 INSTRUCTIONS AND TOOLS**

- A. It shall be the responsibility of the supplier to provide installation and repair manuals and adjusting tools, wrenches, etc... for all products.
- B. It is understood the Owner has no current access control system and the system supplier, in cooperation with the manufacturer, shall provide Owner training; supervised and video-taped by the Contractor.
- C. It is understood the Owner will lease space to a tenant and the system supplier, in cooperation with the manufacturer, shall provide Owner training on creating and programming user cards for different user groups.

**3.06 FUNCTIONAL REQUIREMENTS**

- A. Access Control shall initiate a configurable lock-down sequence upon trip of a panic button. Sequence shall perform the following operations:
  - 1. Close and lock doors specified by the Owner
  - 2. Dial Emergency Services via Central Station
    - a. Dialer shall auto-test daily to Central Station

**3.07 ACCESS CONTROL LOCATIONS**

- A. See Electrical Drawings.
- B. See ELECTRONIC HARDWARE SETS

**3.08 INSTRUCTIONS AND TOOLS**

- A. It shall be the responsibility of the Access Control supplier to provide installation and repair manuals and adjusting tools, keys, wrenches, etc... for the following operating products.
  - 1. Panels (all types)
  - 2. Exit Devices (all types)

**3.09 CARD STYLE CREDENTIALS**

- A. 300 Card style credentials shall be included.

### **3.10 ELECTRONIC HARDWARE SETS**

- A. Each Hardware Set listed below represents the complete hardware requirements for one opening. (Single Door or Pair of Doors). Furnish the quantities required for each set for the work.

#### **EHW-1:**

Doors: 120B  
2 – Door Position Sensor

#### **EHW-2:**

Doors: ST4.1A  
1 – Card Reader  
1 – Request to Exit Device  
2 – Door Position Sensor  
1 – Power Supply  
1 – Wiring Diagram

#### **EHW-3:**

Doors: 107  
1 – Card Reader  
1 – Request to Exit Device  
1 – Door Position Sensor  
1 – Power Supply  
1 – Wiring Diagram

#### **EHW-4:**

Doors: 118B  
1 – Card Reader  
1 – Request to Exit Device  
1 – Door Position Sensor  
1 – Power Supply  
1 – Wiring Diagram

#### **EHW-5:**

Doors: 140C, 150C, 160C, 170C, ST3.1B  
1 – Door Position Sensor

**EHW-6:**

Doors: 135B

- 1 – Card Reader
- 1 – Request to Exit Device
- 1 – Door Position Sensor
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-9:**

Doors: 100Ac, 241A

- 1 – Card Reader
- 1 – Request to Exit Device
- 2 – Door Position Sensor
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-9A:**

Doors: 100Db

- 1 – Card Reader
- 1 – Request to Exit Device
- 2 – Door Position Sensor
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-9.1:**

Doors: 288

- 2 – Card Reader
- 2 – Door Position Sensor
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-10:**

Doors: 100Aa

- 1 – Card Reader

- 1 – Request to Exit Device
- 2 – Door Position Sensor
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-11:**

- Doors: 100D
- 2 – Card Reader
  - 2 – Door Position Sensor
  - 1 – Power Supply
  - 1 – Wiring Diagram

**EHW-12:**

- Doors: 101Ba
- 1 – Card Reader
  - 1 – Door Position Sensor
  - 1 – Request to Exit Device
  - 1 – Power Supply
  - 1 – Wiring Diagram

**EHW-15:**

- Doors: 117B
- 1 – Card Reader
  - 2 – Door Position Sensor
  - 1 – Request to Exit Device
  - 1 – Power Supply
  - 1 – Wiring Diagram

**EHW-20:**

- Doors: ST4.2
- 2 – Card Reader
  - 1 – Door Position Sensor
  - 1 – Power Supply
  - 1 – Wiring Diagram

**EHW-21:**

- Doors: 101Bc, 102B, 270
- 1 – Card Reader
  - 1 – Door Position Sensor

- 1 – Request to Exit Device
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-30:**

Doors: 107B

- 1 – Card Reader
- 2 – Door Position Sensor
- 1 – Request to Exit Device
- 1 – Power Supply
- 1 – Wiring Diagram

**EHW-40:**

Doors: 110B, 108B, 100Fa, 170D, 100Ea, 130A, 130B

- 1 – Card Reader
- 1 – Overhead Door Contact
- 1 – Garage Door Receiver
- 1 – Garage Door Transmitter

**END OF SECTION**



**SECTION 08 72 10  
INTERCOM****PART 1 –GENERAL****1.01 RELATED DOCUMENTS**

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

**1.02 DESCRIPTION OF WORK**

- A. The work of this section includes, but is not limited to, the following:
  - 1. Providing electronic intercom devices.
  - 2. Providing wiring to all intercom control devices.
  - 3. Providing controllers and all control hardware for intercom control.
  - 4. Providing configuration and training on intercom system.

**1.03 RELATED WORK**

- A. Carefully examine all of the Contract Documents for requirements which affect the work of this section. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
  - 1. Section 08 71 00 – Door Hardware
  - 2. Section 08 72 00 – Access Control
  - 3. Section 08 72 20 – CCTV

**1.04 INTENT**

- A. A major intent of the work of this section is to provide a system to communicate with users at door stations and remotely grant them access where applicable.
- B. Systems will be integrated with access control system.

**1.05 QUALITY ASSURANCE**

- A. Intercom supplier shall be fully licensed and competent in systems install and service.
- B. Intercom supplier shall warrant and guarantee, in writing, that hardware supplied is free of defective material and workmanship. Supplier shall further warrant and guarantee for a period of one year from Owner's Use and Occupancy that the hardware shall function in a satisfactory manner without binding, collapse, or dislodging of its parts, provide the installation is made to the manufacturer's recommendations.
- C. The intercom supplier shall repair or remedy, without charge, any defect of workmanship or material for which he is responsible hereunder.

**1.06 SUBMITTALS**

- A. Submit the following in accordance with Section 01 30 00 – Administrative Requirements.
  - 1. Samples: If requested, submit to the Architect for approval, a complete line of samples as directed. Samples shall be plainly marked, the manufacturer's numbers, types and sizes.
  - 2. Submit names of technicians, relevant certifications, licenses and years of experience who may be assigned to this project.
  - 3. Submit on-going license, hosting, monitoring and any other fees incurred for normal use of this system as designed.

**PART 2 – PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

Master Station	Aiphone Talkaphone	Japan Niles, IL
Door Station	Aiphone Talkaphone	Japan Niles, IL

**2.02 MATERIALS AND QUALITY**

- A. All products shall be of the best grade entirely free from imperfections manufacturer and finish.
- B. Provide, as far as possible, devices of one manufacturer. Modifications to devices that are necessary to conform to construction shown or specified shall be provided as required for the specified operation and functional features.

**2.03 MINIMUM REQUIREMENTS**

- A. MASTER STATION
  - a. Video and Audio 2 way communication
  - b. Door release capability
  - c. Capable of expanding to 6 total Master Stations
  - d. Desk Mount Style
- B. DOOR STATION
  - a. IP66 rated
  - b. Video and Audio 2 way communication
  - c. Vandal resistant
  - d. Capable of mounting to pedestal

**PART 3—EXECUTION****3.01. INSPECTION**

- A. It shall be the general contractor's responsibility to inspect all intercom components for proper installation and functionality

**3.02 INSTALLATION/ADJUSTMENT/LOCATION**

- A. All materials shall be installed in a workmanlike manner following the manufacture's recommended instructions.
- B. The adjustments for all cameras and equipment shall be the installer's responsibility and these adjustments shall be made at the time of installation.
- C. No wiring shall be exposed or visible at door station locations.
- D. All wiring leaving the building shall be rated for direct burial.

**3.03 FIELD QUALITY CONTROL**

- A. Upon completion of the installation of the system, it shall be the responsibility of the intercom supplier to visit the project and to examine the system for each view on which he has provided camera view and to verify that all devices are in proper working order. Should he find items not operating properly he should make a report, in writing, to the

general contractor, advising him of the problem and the measures required to correct the problem.

### **3.04 CLEANING**

- A. It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

### **3.05 INSTRUCTIONS AND TOOLS**

- A. It shall be the responsibility of the supplier to provide installation and repair manuals and adjusting tools, wrenches, etc... for all products.

### **3.06 INTERCOM LAYOUT**

1. System 1:
  - a. System shall provide Audio and Video communications as well as door release functions.
    - i. System shall include 2 Master Stations and 2 Door Stations.
  - b. Exterior at Door 107C:
    - i. Door station intercom with audio, video and door release
  - c. Interior Master Station in room 105
    - i. Master station to communicate audio, video and door release to Door station at 107C only
    - ii. Shall be desk mountable
2. System 2:
  - a. System 2 shall provide Audio and Video communications as well as door release functions. System shall include a total of 6 Master Stations and 2 Door Stations.
  - b. Front Entry Area
    - i. Door Station shall be an integrated Video, Audio and door release as well as Card Reader compatible with system listed in 08 72 00 all in one unit.
    - ii. Intercom/Card reader shall be mounted on pedestal listed in 08 72 00.
  - c. Front Entry at Door 100Aa
    - i. Reception area will have 2 desk mounted Master Stations capable of Audio, Video communications with 100Aa as well as door release.
    - ii. Reception area will be prewired for 2 additional Master Stations with the same capabilities to be added on Reception counter at a later time.
    - iii. Office 202 will have 1 desk mounted Master Station capable of Audio, Video communications as well as door release with door station at door 100Aa

**END OF SECTION**

**SECTION 08 72 20**  
**CCTV****PART 1 –GENERAL****1.01 RELATED DOCUMENTS**

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

**1.02 DESCRIPTION OF WORK**

- A. The work of this section includes, but is not limited to, the following:
  - 1. Providing CCTV devices, hardware and systems.
  - 2. Providing wiring to all CCTV devices.
  - 3. Labor to install parts provided by Owner (relocating existing CCTV cameras)
  - 4. Providing servers and software.
  - 5. Providing configuration and training on CCTV system.

**1.03 RELATED WORK**

- A. Carefully examine all of the Contract Documents for requirements which affect the work of this section. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
  - 1. Section 08 71 00 – Door Hardware
  - 2. Section 08 72 00 – Access Control
  - 3. Section 08 72 10 – Intercom

**1.04 INTENT**

- A. A major intent of the work of this section is to provide a system to monitor premise both live and forensic video footage.

**1.05 QUALITY ASSURANCE**

- A. CCTV supplier shall be fully licensed and competent in systems install and service.
- B. CCTV supplier shall warrant and guarantee, in writing, that hardware supplied is free of defective material and workmanship. Supplier shall further warrant and guarantee for a period of two years from Owner's Use and Occupancy that the hardware shall function in a satisfactory manner without binding, collapse, or dislodging of its parts, provide the installation is made to the manufacturer's recommendations.
- C. The CCTV supplier shall repair or remedy, without charge, any defect of workmanship or material for which he is responsible hereunder.

**1.06 SUBMITTALS**

- A. Submit the following in accordance with Section 01 30 00 – Administrative Requirements.
  - 1. Samples: Submit a complete list of samples for each product. Samples shall be plainly marked, the manufacturer's numbers, types and sizes.
  - 2. Submit names of technicians, relevant certifications, licenses and years of experience who may be assigned to this project.
  - 3. Submit on-going license, hosting, monitoring and any other fees incurred for normal use of this system as designed.

**PART 2 – PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

Cameras	Axis Arecont Vision Samsung Panasonic	Lund, Sweden Glendale, CA Seoul, South Korea Kadoma, Japan
VMS Software	ExacqVision Video Insight Salient Solutions OpenEye	Fishers, IN Houston, TX Austin, TX Liberty Lake, WA
Server	Dell Seneca	Round Rock, TX Centennial, CO
Network Switches	Allied Telesis Netgear	Bothell, WA San Jose, CA
Monitors	NEC LG Samsung	Itasca, IL Seoul, South Korea Seoul, South Korea

**2.02 MATERIALS AND QUALITY**

- A. All products shall be of the best grade entirely free from imperfections manufacturer and finish.
- B. Provide devices from one manufacturer. Modifications to devices that are necessary to conform to construction shown or specified shall be provided as required for the specified operation and functional features.

**2.03 MINIMUM REQUIREMENTS**

- A. CAMERAS
  - a. All cameras to be hardwired with wiring as specified in Electrical Section
  - b. All cameras to have field adjustable views
  - c. All cameras powered via PoE
  - d. Indoor cameras are to be vandal resistant dome style mounted horizontally
  - e. Exterior cameras to be IP66 rated
  - f. Minimum picture quality 3MegaPixel
  - g. 17 Exterior cameras will be provided by the Owner for reuse: Axis P1354
  - h. Pole mounted cameras in parking lot shall include:
    - i. 12MP Resolution
    - ii. 4x2.8mm lenses
    - iii. 3-axis Gimbal
    - iv. Remote Focus
    - v. True Day/Night
    - vi. IK10 Vandal Resistant
    - vii. Powered off 1 Cat5e cable
    - viii. WDR
- B. VMS Software
  - a. Capable of 10 simultaneous work stations
  - b. Capable of remote viewing
  - c. Capable of multiple configurable outputs for monitors
  - d. Capable of remote notification
  - e. Capable of accepting open platform IP cameras

- f. Access Control Integration
- C. SERVER
  - a. Multiple NIC cards for dual network
  - b. Solid State Hard Drive
  - c. Storage capable of 45 Days of video with the following requirements
    - i. 3MP record quality
    - ii. 8 Frames per second
    - iii. H.264 format
    - iv. Constant recording
  - d. Windows Operating system
  - e. Rack Mountable
- D. NETWORK SWITCHES
  - a. Rack Mountable
  - b. Managed Switches
  - c. 2 SFP ports per switch
  - d. POE+
- E. MONITORS
  - a. Commercial Grade
  - b. Capable of 24/7 continuous use
  - c. Two (2) 32" Monitor
  - d. Maximum height of 2' 4"
  - e. HDMI Input
  - f. To be either wall mounted or pendant mount, as required by the Owner.

### **PART 3—EXECUTION**

#### **3.01. INSPECTION**

- A. It shall be the general contractor's responsibility to inspect all camera locations for proper view and proper mounting.

#### **3.02 INSTALLATION/ADJUSTMENT/LOCATION**

- A. All materials shall be installed in a workmanlike manner following the manufacture's recommended instructions.
- B. The adjustments for all cameras and equipment shall be the installer's responsibility and these adjustments shall be made at the time of installation.
- C. No wiring shall be exposed or visible at camera locations.
- D. All wiring leaving the building shall be rated for direct burial.

#### **3.03 FIELD QUALITY CONTROL**

- A. Upon completion of the installation of the system, it shall be the responsibility of the CCTV supplier to visit the project and to examine the system for each view on which he has provided camera view and to verify that all devices are in proper working order. Should he find items not operating properly he should make a report, in writing, to the general contractor, advising him of the problem and the measures required to correct the problem.

#### **3.04 CLEANING**

- A. It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

**3.05 INSTRUCTIONS AND TOOLS**

- A. It shall be the responsibility of the supplier to provide installation and repair manuals and adjusting tools, wrenches, etc... for all products.

**3.06 DEVICE LOCATIONS**

- A. See Electrical Drawings.

**END OF SECTION**

**SECTION 08 80 00**  
**GLAZING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Glass, mirrors and insulating glass panels.
- B. Insulated metal glazing panels, glazing compounds and accessories.
- C. Sliding display case windows and glass shelves.
- D. Fire-rated glazing and frame system for installation as wall sections in interior fire wall openings.
- E. Plastic Films.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 90 05 - Joint Sealers: Sealant and back-up material.
- B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed borrowed lites.
- C. Section 08 43 13 - Aluminum-Framed Storefronts: Glazed framing and entrance doors.
- D. Section 08 44 13 – Glazed Aluminum Curtain Walls: Glazed framing and entrance doors.
- E. Section 08 54 13 - Fiberglass Windows: Glazing provided by window manufacturer.
- F. Section 10 28 00 - Toilet Accessories: Framed mirrors.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
- D. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2009e1.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
- I. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
- J. GANA - GANA Glazing Manual; Glass Association of North America; 2009.
- K. GANA - GANA Sealant Manual; Glass Association of North America; 2008.
- L. ICC - International Building Code; 2009.
- M. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; 2004.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Convene a pre-installation meeting one week before starting work of this Section; require attendance by all affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.



- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Shop Drawings:
  - 1. Submit glazing schedule indicating all openings to be glazed and type of glazing.
  - 2. Submit frame shop drawings including plans, elevations, and details, dimensions and attachment to structure.
- E. Samples: Submit samples 8x8 inch in size of each type of glass units.

**1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years documented experience.
- C. All heat strengthened, tempered and laminated glass shall be permanently labeled by such means as etching, sandblasting, firing of ceramic materials on the glass, or by other suitable means so as to be easily visible and legible. The label shall identify the nominal thickness, glass type and compliance with requirements of ANSI Z97.1 and with a certification label of the Safety Glazing Certification Council (SGCC) or other certifying agency acceptable to the Authority Having Jurisdiction.
  - 1. Fire-protection-rated glazing shall be permanently labeled per IBC requirements with name of manufacturer, test standard and rating identification.
- D. Fire-rated window glazing and frame assemblies shall comply with NFPA 80, labeled by UL for fire rating indicated based on testing per ASTM E119. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.

**1.07 DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store and handle as recommended by the manufacturer. At delivery inspect all containers for damage and examine glass and frame units for damage. Store glazing materials and frame units in original packing containers
  - 1. For fire-rated window glazing and frame assemblies, do not expose glazing material of frame units to sunlight and weather. Do not store horizontally. Place glass and frames upright, no less than 6 degrees from vertical. Store all materials in dry conditions, off the ground. Glass and frame units must be separated by non-abrasive pads such as cloth or cork. Do not stack containers.

**1.08 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

**1.09 WARRANTY**

- A. See Section 01 78 10 - Warranties.
- B. Sealed Glass Units: Provide a ten (10) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same. The warranty shall ensure that coatings will not crack, flake, peel or otherwise fail or degrade.
- C. Fire-rated window glazing and frame assemblies: Manufacturer's limited five-year warranty from Date of Substantial Completion.
- D. Laminated Glass: Provide a ten (10) year warranty to include coverage for delamination, including replacement of failed units.
- E. Polycarbonate Sheet Glazing: Provide a fifteen (15) year warranty to include coverage for breakage, coating failure, abrasion resistance, including replacement of failed units.

- F. Firestop Glass: Provide a five (5) year warranty to include coverage for defective materials and workmanship for all firestop glass.

## **PART 2 PRODUCTS**

### **2.01 GLAZING TYPES**

- A. Type IG-1 - Sealed Insulating Glass Units: Vision glazing.
1. Application(s): All exterior glazing unless otherwise indicated.
  2. Outboard Lite: Heat-strengthened float glass, or tempered glass where required by code or where indicated, 1/4 inch thick, minimum.
    - a. Tint: Clear.
    - b. Coating: Low-E type, on #2 surface.
  3. Inboard Lite: Annealed float glass or tempered glass where required by code or where indicated, 1/4 inch thick, minimum.
    - a. Tint: Clear.
  4. Total Thickness: 1 inch.
  5. Tempered Glass Applications: Provide this type of glazing in the following locations:
    - a. Glazed lites in exterior doors.
    - b. Glazed sidelights and panels next to doors.
    - c. Other locations required by applicable federal, State, and local codes and regulations.
    - d. Other locations indicated on the Drawings.
  6. Performance Requirements:
    - a. Visible Light Transmittance (VLT): 70%, nominal.
    - b. Winter U Value: 0.25 max.
    - c. Summer U Value: 0.25 max.
    - d. Light to Solar Gain Ratio (LSG): 1.85
    - e. Solar Heat Gain Coefficient (SHGC): 0.38 percent, nominal.
- B. Type IG-2 - Sealed Insulating Glass Units: Spandrel glazing.
1. Application: Exterior glazing where indicated.
  2. Outboard Lite: Heat-strengthened float glass and tempered glass where required by code or where indicated, 1/4 inch thick, minimum.
    - a. Coating: Same as on vision units, on #2 surface.
  3. Inboard Lite: Heat-strengthened float glass and tempered glass where required by code or where indicated, 1/4 inch thick.
    - a. Opacifier Color: To be selected by Architect from manufacturer's full range.
  4. Total Thickness: 1 inch.
  5. Safety (tempered) Glazing Applications: Provide this type of glazing in the following locations:
    - a. Glazed sidelights and panels next to doors.
    - b. Other locations required by applicable federal, State, and local codes and regulations.
  6. Other locations indicated on the Drawings.
- C. Type IG-3 – Same as Type IG-1, of indoor application; acoustic insulating, not thermal.
- D. Type IG-4 – Not Used.
- E. Type IG-5 - Sealed Insulating Glass Units: Vision glazing.
1. See Section 08 36 13 – Overhead Sectional Doors.
- F. Type S-1 - Single Vision Glazing: Non-fire-rated, clear, fully tempered.
1. Applications: All non-fire-rated interior glazing unless otherwise indicated.
  2. Thickness: 1/4 inch minimum, as required by panel size and guardrail loading.
- G. Type S-2 Fire-rated Safety Glazing: Laminated safety glass with intumescent interlayer, clear; 3/4" for 45 min; 1/4" for 20 min; barrier to heat; hose stream tested.

1. Applications and IBC Fire Protection Ratings:
  - a. Glazed lites in fire doors at 1 hour fire barriers: D-H-T-45 minimum.
  - b. Glazed lites in fire doors at 1 hour fire barriers: D-H-T-60 minute.
  - c. Glazed fire windows, borrowed lites, sidelights in 1 hour fire barriers: OH-45.
2. Fire Protection Ratings: As indicated on the Drawings.
3. Fire Window Frames: Fire-rated hollow metal, See Section 08 11 13.
4. Glazing Method: As required for fire rating.
- H. Type S-3 - Security Glazing: Clear, laminated glass with plastic interlayer, non-fire-rated.
  1. Applications: Interior where indicated.
  2. Thickness: 5/16 inch minimum.
- I. Type S-4 - Mirror Glass:
  1. Application: Wall mounted at locations indicated on the Drawings.
  2. Thickness: 1/4 inch.
- J. Type S-6 - Glass Door Panels:
  1. Applications: Interior display cases.
  2. Type: Clear, fully tempered float glass with polished edges and corners.
  3. Glazing Thickness: 1/4 inch. Thickness for large display doors as determined by engineering.
- K. Type P-1 - Plastic Glazing: Polycarbonate, clear.
  1. See Section 08 36 13 – Overhead Sectional Doors.

## 2.02 EXTERIOR GLAZING ASSEMBLIES

- A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with International Building code, 2009 edition.
  1. Design Wind Speed: See Structural Drawings.
  2. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
  3. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
  4. Thicknesses listed are minimum.
- B. Thermal and Optical Performance: Provide glass products with performance properties specified above. Performance properties shall be manufacturer's published data as determined according to the following procedures:
  1. Center of glass U-Value: NFRC 100 methodology using LBNL WINDOW 5.2 computer program.
  2. Center of glass solar heat gain coefficient: NFRC 200 methodology using LBNL-35298 WINDOW 5.2 computer program.
  3. Solar optical properties: NFRC 300.
- C. Insulating Glass shall comply with ASTM D 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation. Unit shall be certified for compliance by the IGCC.
- D. Unit Overall Thickness Tolerance: - 1/16" / + 1/32".
- E. Comply with ASTM E546 Standard Test Method for Frost Point of Sealed Insulating Glass Units and ASTM E576 for insulating glass units in the vertical position.
- F. Insulating glass units shall be double sealed with a primary seal of polyisobutylene and a secondary seal of silicone.
  1. Minimum thickness of secondary seal: 1/16".
  2. Target width of primary seal: 5/32".
  3. No primary seal voids or skips allowed.
  4. Gaps or skips between the primary and secondary sealants are permitted to a maximum width of 1/16" by maximum length of 2" with gaps separated by at least 18". Continuous contact between the primary seal and the secondary seal shall be provided.
  5. Primary and secondary sealant adhesion shall exhibit continuous, tenacious adhesion to both glass and spacer contact areas.

- G. Lite spacer shall be aluminum with three bent corners and one keyed-soldered corner or four bent corners and one straight butyl injected zinc plated steel straight key joint to provide a hermetically sealed and dehydrated space.
- H. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
  - 1. In conjunction with vapor retarder and joint sealer materials described in other Sections.
  - 2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

### **2.03 GLASS MATERIALS**

- A. Float Glass Manufacturers:
  - 1. AGC Flat Glass North America, Inc.
  - 2. Guardian Industries Corp.
  - 3. Pilkington North America Inc.
  - 4. PPG Industries, Inc.
- B. Float Glass: All glazing shall be float glass unless otherwise indicated.
  - 1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
  - 2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
  - 3. Tinted Types: Color and performance characteristics as indicated.
  - 4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- C. Fire-Protection-Rated Glazing (Type S-2): Type, thickness, and configuration as required to achieve indicated ratings.
  - 1. Safety Certification: 16 CFR 1201 Category II.
  - 2. IBC Fire Protection Rating: As indicated on drawings.
  - 2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
  - 3. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.
  - 4. Product: Pilkington Pyrostop by Technical Glass Products.
- D. Laminated Glass (Type S-3): Float glass laminated in accordance with ASTM C1172.
  - 1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
  - 2. Plastic Interlayer: 0.060 inch thick, minimum.
  - 3. Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.
  - 4. Manufacturers:
    - a. AGC Flat Glass North America, Inc.
    - b. Cardinal Glass Industries.
    - c. Viracon, Apogee Enterprises, Inc.
- E. Mirrored Glass (S-4): Laminated safety glass; ASTM C1503; ASTM C1036, Type 1, Class 1 quality Q1, single-side silver coated, hermetically sealed with uniform electroplated copper coating, protected by a coat of mineral oxide oil base paint.
  - 1. Ground edges.
  - 2. Pre-drill holes as required.

### **2.04 SEALED INSULATING GLASS UNITS**

- A. Manufacturers:
  - 1. IG-1 Basis of Design: Solar Screen Low E by Viracon.
  - 2. IG-2 Basis of Design: Viraspan Lead-Free Spandrel Glass by Viracon.
  - 3. IG-3 and IG-4: Any fabricator certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty, if any.
  - 4. Substitutions: Refer to Section 01 60 00 - Product Requirements.

### **2.05 FIRE-RATED WINDOW, DOOR, GLAZING AND FRAME ASSEMBLIES**

- A. Fire-Rated Window, Door Glazing and Frame Assembly: ASTM E119, UL listed and labeled glazing and steel frame system; NFPA 80 compliant. Type S-6 windows.
  - 1. UL labeled; 60 minute doors and 60 minute windows.
  - 2. Glazing Accessories: Manufacturer's standard gaskets, spacers, setting blocks, as required for complete installation.
- B. Glazing Product: Pyrostop by Pilkington.
- C. Warranty: Manufacturer's five year.
- D. Fire-Rated Doors: Narrow-profile, roll formed steel architectural grade specialty fire doors, complete with manufacturer's hardware for double out-swinging doors with exit devices. Key cylinder provide by Section 08 71 00.
- E. Fire-Rated Frames: Steel profiled formed tubing permanently welded.
  - 1. UL labeled; ratings as indicated.
  - 2. Size: Perimeter Face: 3-1/8 inch; Horizontal and Vertical Mullion Face: 4-1/8 inch; Depth as required for rating and profile.
  - 3. Insulation: Insulate framing system against effects of fire, smoke, and heat transfer from either side. Insulate profiled steel tubing using a shell construction that incorporates Promatect-H intermediate interlayer. Firmly pack perimeter of framing system to rough opening with mineral wool fire stop insulation or appropriately rated intumescent sealant.
  - 4. Steel Glazing Beads: Extruded steel beads with dimensions recommended by manufacturer to securely hold glazing material in place.
  - 5. Fasteners: Type recommended by manufacturer
  - 6. Frame Finish: Factory powder coat finish, AAMA 2603 compliant; color as selected from manufacturer's full range.
  - 7. Doors and Frame System Product: Fireframe Heat Barrier Series by Technical Glass Products.
    - a. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.07 INSULATED SOLID GLAZING PANELS**

- A. Type M-1 – Insulated Aluminum Glazing Panels: Opaque panels of balanced laminated construction; 1 inch thickness.
  - 1. Panel Surface: Exterior and interior surfaces 0.032 inch aluminum anodized. Return edges to conceal inner core.
  - 2. Adhesive: Permanently elastic type; neoprene or rubber base suitable for exterior use and covering 100% of the surfaces to be laminated.
  - 3. Panel Core Composition:
    - a. 1/8 inch thermoplastic core.
    - b. Polyisocyanurate foam, 5/8 inch minimum.
    - c. 1/8 inch thermoplastic core.
  - 4. Basis of Design: Endurex 500 Series Architectural Panels by Nudo.
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.
  - 6. Type M-2: See Section 08 36 13 – Overhead Sectional Doors.

## **2.08 GLAZING COMPOUNDS**

- A. Glazing Compound: Elastic type.
  - 1. Bostik Inc.
  - 2. Momentive Performance Materials, Inc.
  - 3. Pecora Corporation.
  - 4. BASF Construction Chemicals-Building Systems.
  - 5. DAP Inc..
  - 6. Dow.
  - 7. Substitutions: Refer to Section 01 60 00 - Product Requirements.

## **2.09 GLAZING ACCESSORIES**

- A. Glazing Materials: Select glazing compounds, sealants, tapes, gaskets and additional glazing materials of proven compatibility with other materials they will contact, including glass products,

seals of insulating glass units and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

- B. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining.
  - 1. Product: Silpruf SCS2000 by GE Sealants.

## **2.10 PLASTIC FILMS**

- A. Plastic Film (PF-1): Dry erase polyester film with permanent acrylic pressure sensitive adhesive for application on glass; 4 mm thickness, Class A fire-rated.
  - 1. Product: Solyx Writeable Dry Erase Film - Whiteout by Decorative Films, LLC.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.11 MISCELLANEOUS ACCESSORIES**

- A. Display Case Sliding Glass Door Hardware: For doors up to 60". Clear anodized. Provide components as follows in quantities recommended by the manufacturer for each application. Manufacturer: Knappe & Vogt or Style Mark.
  - 1. Upper Channels: K&V 1093.
  - 2. Shoes: K&V 1095
  - 3. Rollers: K&V 1097
  - 4. Guides: K&V 1085
  - 5. Bumpers: K&V 1087
  - 6. Lower Track: K&V 1099.
  - 7. Ratchet Locks: K&V 963, key alike.
  - 8. Pulls: K&V 836.
- B. Corner Brackets for Butt Glazing: Brass, approximately 1-1/2" x 1-1/2" x 1/8" for through bolting. Provide brackets at approximately 24 inches on center.
- C. Mirror Trim: Brushed stainless steel "J" trim, wrapping all exposed perimeter edges and lapping approximately 1/4" onto face of glass. Trim shall fit snugly, without damaging mirror coating.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance. Glass sizes indicated on the Drawings are approximate only.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.02 PREPARATION**

- A. All frames shall be checked prior to glazing to make certain openings are square, plumb and secure in order that uniform face and edge clearances are maintained.
- B. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.
- C. Install sealant in accordance with manufacturer's instructions.

### **3.03 GLAZING METHODS**

- A. All glazing shall be performed in accordance with standards of FGMA, AAMA and SIGMA, latest editions. Glass clearance dimensions shall be based on the type and thickness of the glass as determined by the FGMA Glazing Manual, or as hereinafter specified.
- B. No glass shall be installed where it may be damaged unless it is properly protected at all times. Any damaged or defective glass shall be removed and replaced with new perfect glass at no additional cost to the Owner.
- C. Install fire-rated glass in strict accordance with tested assemblies and the manufacturer's instructions and recommendations.

- D. Fire-rated glazing shall not be field cut. Do not install damaged, chipped or field tampered panels.

#### **3.04 INSTALLATION – FILM**

- A. Clean application surfaces thoroughly prior to installation. Install in accordance with manufacturer's instructions. Cut film edges neatly and square at a uniform distance of 1/8 inch to 1/16 inch from window sealant. Spray slip solution on glass and adhesive to facilitate proper positioning of film. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- B. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

#### **3.05 MIRRORS**

- A. Mirrors shall be adhered directly to back-up walls as recommended by the manufacturer. Provide additional mechanical fastening devices as required and approved by the Architect.
- B. Mirrors shall be installed with top and bottom continuous chrome glazing channels.

#### **3.06 CLEANING**

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

**END OF SECTION**

**SECTION 08 91 00**  
**LOUVERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Louvers, frames, and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 25 00 - Weather Barriers: Sealing frames to weather barrier installed on adjacent construction.
- B. Section 08 43 13 - Aluminum Storefronts: Prepared openings for louvers.

**1.03 REFERENCE STANDARDS**

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- C. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2012.
- D. AMCA 511 - Certified Ratings Program for Air Control Devices; 2010.
- E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- D. Samples: Submit two samples 2 by 2 inches in size illustrating finish and color of exterior surfaces.
- E. Test Reports: Independent agency reports showing compliance with specified performance criteria.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this Section, with minimum fifteen years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience .

**1.06 WARRANTY**

- A. See Section 01 78 00 - Project Close-out, for additional warranty requirements.
- B. Provide twenty year manufacturer warranty against distortion, metal degradation, and failure of connections.
  - 1. Finish: Include coverage against degradation of exterior finish.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Louvers:



1. Ruskin Manufacturing
2. Airolite Company, LLC
3. Construction Specialties, Inc
4. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 LOUVERS

- A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories ; AMCA Certified in accordance with AMCA 511.
  1. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf (100 MPH) without damage or permanent deformation.
  2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
  3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
  4. Screens: Provide bird screens at all louvers.
  5. Sizes to fit into aluminum storefront frames or wall systems; as detailed on Drawings.
- B. Stationary Louvers : Horizontal blade, extruded aluminum construction , with intermediate mullions matching frame.
  1. Free Area: 47 percent, minimum.
  2. Blades: V-shaped, sight-proof.
  3. Frame: 4 inches deep, channel profile; corner joints mitered and , with continuous recessed caulking channel each side.
  4. Aluminum Thickness: Frame 12 gage, 0.0808 inch minimum; blades 12 gage, 0.0808 inch minimum.
  5. Aluminum Finish: Superior performing organic coatings .

## 2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M) .

## 2.04 FINISHES

- A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
  1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss as indicated on drawings.
- B. Color: Custom, to match approved aluminum curtainwall sample.

## 2.05 ACCESSORIES

- A. Blank-Off Panels: Aluminum face and back sheets, polyisocyanurate foam core, 1 inch thick , painted black on exterior side. Blank-off panel to be sealed to louver frame. Duct connection to louver is required to be smaller than louver frame. Duct to seal against blank-off panel.
- B. Bird Screen: Interwoven wire mesh of steel, 14 gage, 0.0641 inch diameter wire, 1/2 inch open weave, diagonal design.
- C. Fasteners and Anchors: Stainless steel.
- D. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.
- E. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.

**3.02 INSTALLATION**

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb, sealed on all sides in continuous bed of sealant.
- C. Set sill members and sill flashing in continuous bead of sealant.
- D. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- E. Secure louver frames in openings with concealed fasteners.
- F. Install perimeter sealant and backing rod in accordance with Section 07 90 05.
- G. Coordinate with installation of mechanical ductwork.

**3.03 CLEANING**

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

**END OF SECTION**

**SECTION 09 05 61**  
**COMMON WORK RESULTS FOR FLOORING PREPARATION**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Preparation of new concrete floor slabs for installation of floor coverings.
- B. Testing of concrete floor slabs for moisture and pH.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds and finish for concrete slabs to receive finish flooring. Concrete Moisture Vapor Reduction Admixtures.
- C. Section 09 65 00 - Resilient Flooring.
- D. Section 12 48 13 – Entrance Floor Mats.

**1.03 REFERENCES**

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- B. ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.

**1.04 SUBMITTALS**

- A. Product Data: Floor covering and adhesive manufacturers' product data for each specific combination of substrate, floor covering, and adhesive to be used, submit:
  - 1. Manufacturer's recommended slab moisture and pH limits.
  - 2. Manufacturer's required bond/compatibility test procedure.
- B. Field Reports:
  - 1. Submit visual observation report for substrates to receive flooring.
  - 2. Submit contractor's field adhesive bond and compatibility test results.
- C. Test Reports:
  - 1. Admixture scientific testing reports as a portion of Concrete Moisture Vapor Reduction Admixtures (Barrier 1) specified in Section 03 30 00 – Concrete: Indicate performance of Admixtures meet or exceed manufacturer standard requirements.
  - 2. Review of scientific testing process and acceptance by both the Floor Covering & Adhesive Manufacturer and flooring subcontractor stating compatibility of and acceptance of admixtures with installation of products specified.
  - 3. Provide copies of admixture test results and written acceptance of results as an approved substrate for flooring products indicated by flooring manufacturer and installer.

**1.05 QUALITY ASSURANCE**

- A. Moisture and pH testing shall be performed by an independent testing agency employed and paid for by Contractor.
- B. Contractor shall perform adhesive and bond test with his own personnel or hire a testing agency.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
  - 1. Provide access for and cooperate with testing agency.
  - 2. Confirm date of start of testing at least 10 days prior to actual start.
  - 3. Allow at least 4 business days on site for testing agency activities.
  - 4. Achieve and maintain specified ambient conditions.
  - 5. Notify Owner when specified ambient conditions have been achieved and when testing will start.

- D. Applicator Qualifications: Companies specializing in performing the work of this Section with minimum five years of experience and approved by the manufacturer.

#### **1.06 PRE-INSTALLATION MEETING**

- A. Convene a pre-installation meeting after the results of slab testing are available and at least two weeks before starting finish flooring installation; require attendance by the Contractor, a technical representative from each flooring manufacturer, flooring installer, Architect and Owner, to review slab moisture levels, floor surface conditions and preparation requirements, materials, installation procedures and coordination of related work.
1. A field report summarizing the findings and recommendations from this meeting shall be issued by the technical representatives and copied to the Owner and Architect.
  2. Written certification from each flooring manufacturer that condition of sub-floor is acceptable for flooring installation shall be issued and copied to the Owner and Architect.
  3. If a slab moisture sealer or other remedial work is required to make the condition of the sub-floor acceptable for the flooring installation, such measures shall be reviewed with the manufacturer's technical representatives and the Contractor shall be instructed to correct the floors at no cost to the Owner.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

#### **1.08 FIELD CONDITIONS**

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Patching Compounds: Cementitious type recommended by adhesive material manufacturer and flooring manufacturer. Calcium sulphate, plaster or gypsum based toppings, leveling and patching compounds are not acceptable.
1. Product:
    - a. K-15 by Ardex. (Slope / Build-up Product: SD-P by Ardex).
    - b. Drytek Premium Skimcoat Patch Underlayment with Primer by Laticrete.
    - c. Substitutions: See Section 01 60 00 – Product Requirements.
- B. Self-leveling Cementitious Underlayment: Portland cement-based self-leveling underlayment.
1. Substrate preparation and conditions shall be reviewed and confirmed with the manufacturer's technical representative prior to installation.
  2. Slab primer as recommended by the underlayment manufacturer.
  3. Products:
    - a. K-15 by Ardex.
    - b. Premium Self-Levelign Underlayment by Loster American Corp.
    - c. Supercap by Laticrete.
    - d. Substitutions: See Section 01 60 00 – Product Requirements.

### **PART 3 EXECUTION**

#### **3.01 CONCRETE SLAB PREPARATION AND TESTING**

- A. Perform following operations in the order indicated:

1. Visual observation of floor slab for adhesion, water damage, alkaline deposits, and other defects.
2. Preliminary cleaning for all slabs.
- B. Contractor's testing agency shall test concrete slab surfaces. Test results shall be made available to the contractor for determination of acceptability by the flooring and adhesives manufacturers. Contractor shall obtain instructions from flooring manufacturers if test results are not within their recommendation limits. Testing shall include:
  1. Internal relative humidity rates per ASTM F1869
  2. Alkalinity, pH rates per ASTM 710.
  3. Scientific Testing of Concrete Moisture Vapor Reduction Admixtures specified in Section 03 30 00.
- C. Contractor shall verify that concrete slabs conform to ASTM F710. Perform adhesive bond tests and water absorption tests.
- D. Testing Agency's Report: Include description of areas tested; include floor plans and photographs if helpful; summary of conditions encountered; copies of specified test methods; certification of accuracy by authorized official of testing agency; and:
  1. Moisture and pH test reports.
  2. Recommendations for remediation of unsatisfactory surfaces.
  3. Submit report directly to Owner not more than two business days after conclusion of testing.
- E. Subfloor surfaces shall not vary more than plus or minus 1/8" in any 10' dimension. Neither shall they vary at a rate greater than 1/16" per running foot. Leveling compound shall be used for larger areas. For subfloor surfaces intended to slope to floor drains, build-up product shall be installed precisely to create proper pitch. Floor pitch shall be laser verified with results submitted to the Architect and Owner.
- F. Any conditions that could adversely affect the flooring installation shall be corrected, prior to proceeding with the Work. Commencement of the installation of flooring shall be considered acceptance of the concrete slab as being suitable for the intended application. Any conditions that could adversely affect the flooring installation shall be brought to the Contractor's attention, for resolution, prior to proceeding with the Work.

### **3.02 SUBSTRATE PREPARATION**

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond. Do not use solvents or other chemicals for cleaning. Do not fill expansion joints or other moving joints.
- B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate. Verify slab substrates conform to ASTM F710.
- C. Subfloor surfaces shall not vary more than plus or minus 1/8" in any 10' dimension. Neither shall they vary at a rate greater than 1/16" per running foot. Leveling compound shall be used for larger areas and for floor areas to receive large format flooring.
  1. For subfloor surfaces intended to slope to floor drains, build-up product shall be installed precisely to create proper pitch. Floor pitch shall be laser verified with results submitted to the Architect and Owner.
  2. Substrate surface pitch shall be confirmed with a laser level for conformance to pitch requirements. Report results to Architect and Owner.
- D. Prepare subfloor surfaces as recommended by flooring and adhesive manufacturers.
- E. Any conditions that could adversely affect the flooring installation shall be corrected, prior to proceeding with the Work. Commencement of the installation of flooring shall be considered acceptance of the concrete slab as being suitable for the intended application. Any conditions

that could adversely affect the flooring installation shall be brought to the Contractor's attention, for resolution, prior to proceeding with the Work.

- E. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor patching compound to achieve smooth, flat, hard surface. Provide transition strips directly over construction joints between new and existing floor slabs where applicable.

### **3.02 UNDERLAYMENT PREPARATION & INSTALLATION**

- A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.
- B. Vacuum clean surfaces. Prime substrate in accordance with manufacturer's instructions. Allow to dry.
- C. Install products in accordance with manufacturer's instructions.
- D. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

### **END OF SECTION**

**SECTION 09 21 16**  
**GYPSUM BOARD ASSEMBLIES**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Performance criteria for new gypsum board assemblies.
- B. Interior metal stud wall framing, shaftwall and miscellaneous framing.
- C. Interior metal channel ceiling and soffit framing.
- D. Acoustic Construction, including installation of acoustic insulation and sealing of joints at framing and gypsum board.
- E. Installation of fire safing insulation at all tops of all stud walls and partitions and as specified herein.
- F. Gypsum wallboard.
- G. Marking and identification of fire-rated assemblies.
- H. Joint treatment, expansion and control joints, special shapes and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 40 00 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing and exterior sheathing.
- B. Section 06 10 54 - Wood Blocking and Curbing: Wood blocking for support of wall-mounted equipment.
- C. Section 07 21 00 - Thermal Insulation: Acoustic insulation.
- D. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire rated walls.
- E. Section 07 90 05 - Joint Sealers: Acoustic sealant.
- F. Section 09 30 00 - Tiling: Tile backer board.

**1.03 REFERENCE STANDARDS**

- A. AISI S100- North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; current edition.
- B. ANSI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions.
- C. D.ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2013.
- D. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- E. ASTM A1003 - Standard Specification for Steel Sheet, Carbon, Metallic-Coated and Nonmetallic-Coated for Cold-Formed Framing Members; 2005.
- F. ASTM C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002 (Reapproved 2007).
- G. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2008.
- H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
- I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2011.
- J. 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; 2011.

- K. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007 (Reapproved 2013).
- M. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.
- N. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets; 2008b.
- O. ASTM C1396- Standard Specification for Gypsum Board; 2011.
- P. ASTM C1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2006.
- Q. ASTM C1658 - Standard Specification for Glass Mat Gypsum Panels; 2012.
- R. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- S. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
- T. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- U. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- V. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.
- W. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2012.
- X. UL - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, runners, head tracks, shaftwall, gypsum board, plaster board, accessories, and joint finishing system
  - 1. Submit manufacturer's metal stud load tables for typical stud partition loading and deflection criteria, identifying stud height, size and thickness selections.
- C. Shop Drawings:
  - 1. Submit fully engineered shop drawings of all partitions with special loading conditions including but not limited to: wall mounted cabinets, shelving, grab bars, counters and other wall mounted equipment specified herein. Submit design criteria, calculations, size and thickness designations, type, location, spacing, connection to building structure, supplemental bracing or accessories, fasteners and details required for proper installation. Shop drawings shall bear the license seal of a professional structural engineer licensed to practice in the State of Maine.
  - 2. Submit color coded floor plans with partition colors keyed to stud manufacturer's color coding system indicating extents of each stud / partition assembly type.
- D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- E. Samples: Upon request, submit samples of all materials and accessories.

#### **1.05 QUALITY ASSURANCE**

- A. Panel Products and Finishing Manufacturer: Unless otherwise indicated, gypsum board and other panel products, accessories and finishing materials shall be from a single manufacturer.
- B. Metal Framing Manufacturer: Unless otherwise indicated, steel framing for gypsum board assemblies shall be from a single manufacturer.
- C. Installer Qualifications: Company specializing in performing steel stud erection, gypsum board application and finishing, with a minimum of 5 years of documented experience and at least



one project with a value of gypsum board assemblies within 60 percent of the cost of gypsum board assemblies for this Project.

- D. Framing components and assemblies required to be engineered and detailed on shop drawings shall include proper accommodations for all live and dead loads, differential building movement, etc. Provide industry standard safety factors as suited to specific job conditions. To the extent that component types and sizes are indicated in the Contract Documents, they shall be considered minimum requirements to be verified and increased (but not decreased) as determined to be necessary by the metal stud contractor's engineer. Framing member depths indicated on the Drawings shall not be altered without the Architect's prior written authorization.

#### **1.06 PRE-INSTALLATION MEETING**

- A. Convene a pre-installation meeting at least 3 weeks prior to start of installation of metal framing systems at the project site, require attendance by the Contractor, gypsum board assembly sub-contractor, installers of other work including door and window frames, mechanical and electrical work, and Architect. Review areas of potential interference and conflicts, coordinate layout, methods to ensure installation of required stud types in appropriate locations, and support provisions for interfacing work.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. All materials shall be delivered to the job site in their original unopened containers or bundles, stored flat under conditions providing adequate protection from damage and exposure to elements and adequately protected from foul weather conditions.
- B. Steel framing and related accessories shall be stored and handled in accordance with AISI Code of Standard Practice.
- C. All fire-rated materials shall bear testing agency labels and required classification numbers.

#### **1.08 WARRANTY**

- A. See Section 01 78 10 - Warranties for term and other warranty requirements.

### **PART 2 PRODUCTS**

#### **2.01 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216. See PART 3 for finishing requirements.
- B. Interior Partitions Indicated as Acoustic: Provide completed assemblies with STC ratings as indicated on the Drawings, calculated in accordance with ASTM E413 by a qualified independent testing agency, based on tests conducted in accordance with ASTM E90.
- C. Shaft Walls: Provide completed assemblies with the following characteristics:
  - 1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
  - 2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- D. Fire Rated Assemblies: Provide completed assemblies as indicated on the Drawings. Materials and construction shall be identical to assemblies whose fire resistance rating has been determined per ASTM E119 by a testing and inspection service acceptable to the Authority Having Jurisdiction. Materials provided shall meet or exceed flame, fuel and smoke requirements of ASTM E84 surface burning characteristics for finish materials.
  - 1. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
  - 2. UL Assembly Numbers: Comply with requirements listed for each particular assembly in the current UL Fire Resistance Directory.
- E. Design Requirements:
  - 1. Steel partition stud maximum spacing: 16 inches on center.
  - 2. Steel partition stud lateral deflections:

- a. Typical gypsum board faced partitions: L/240.
- b. Ceramic tile faced partitions: L/720.
- c. Stone and masonry veneer faced partitions: L/720.
3. Steel partition stud uniform lateral loads:
  - a. Typical gypsum board faced partitions: 5 PSF.
  - b. Ceramic tile faced partitions: 8 PSF.
  - c. Stone and masonry veneer faced partitions: 15 pounds per sq ft.
4. Steel partition stud special loads in addition to uniform lateral loads:
  - a. At a minimum, all partitions with gypsum board finish shall be capable of wall mounted cabinet loading.
  - b. Wall mounted cabinets: Minimum 60 PLF applied vertically 6" from the face of the wall (for a 12" deep cabinet).
  - c. Wall mounted shelving: Minimum 20 PLF per shelf applied vertically 6" from the face of the wall for number of shelves indicated spaced 12" apart with top shelf at 6 feet AFF (for a 12" deep shelf).
  - d. Wall mounted counters: Minimum 100 PLF applied vertically 12" from the face of the wall (for a 24" deep counter) and applied vertically 15" from the face of the wall (for a 30" deep counter).
  - e. Wall mounted video monitors: Minimum of 60 pounds, over area of wall indicated on the Drawings, applied vertically 4" from the face of the wall (for 8" deep monitor).
  - f. Wall mounted handrails: Minimum concentrated force of 200 pounds applied at any point in any direction and, but not simultaneously, a uniform load of 50 PLF applied in any direction 4" from the face of the wall.
  - g. Wall mounted stationary grab bars: Minimum concentrated force of 250 pounds applied at any point in any direction 4" from the face of the wall.
  - h. Walls supporting interior glazed partitions acting as guardrails shall be Cold-Form Metal Framing under Section 05 40 00. See Section 05 51 00 for guardrail loading requirements.
  - i. Wall mounted coat rod rack at Welding Lockers 160A: Minimum 70 PLF of rack applied vertically 6" from the face of the wall.
5. Steel soffit and ceiling framing studs lateral deflection:
  - a. Gypsum board: L/240.

## 2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
  1. Dietrich Metal Framing.
  2. Marino\Ware
  3. EB Metals
  4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Framing System Components: ASTM C 645, roll-formed steel.
  1. Protective Coating: ASTM A653 minimum G60 (Z180) hot-dip galvanized corrosion resistant coating.
  2. Sizes: Sizes and properties necessary to comply with ASTM C 754 and for the spacing, deflection and load conditions indicated, but in no case less than 18 mils (0.0179 inches) minimum thickness.
  3. Studs: C shaped with flat or formed webs, 1-1/4" legs (flanges) with knurled faces; web depths as indicated on the Drawings.
  4. Runners: U shaped, sized to match studs.
  5. Slip-Type Head Track Options:
    - a. Single Long-Leg Runner System: ASTM C645 top runner with 2 inch deep flanges in thickness as required by engineering but not less than stud thickness, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
    - b. Double-Runner System: ASTM C645 top runners, inside runner with 2 inch deep flanges in thickness as required by engineering and fastened to studs, and outer

- runner sized to friction fit inside runner and in thickness as required by engineering but not less than stud thickness.
- c. Deflection Track: Steel sheet top runner to accommodated deflection of structure above; in thickness as required by engineering but not less than stud thickness and in width to accommodate depth of studs.
  6. Ceiling Carrying Channels: C shaped, minimum 54 mils (0.0538 inches); minimum 1/2 inch wide flanges; depth 3/4", 1-1/2", 2", 2-1/2" and as indicated on the Drawings.
  7. Furring Channels: Hat-shaped sections, depth of 7/8 inch with 1/2 inch wide flanges; 22 ga (0.269 inch).
  8. Channel Bridging and Bracing: U shaped; 54 mils thickness; minimum 0.5 inch wide flanges; depth as indicated or required.
  9. Flat Strap and Backing Plates: Continuous straps or plates of electro-galvanized sheet steel, widths as indicated, but not less than three (3) inches in wide. Actual size and thickness shall be as engineered by the stud manufacturer considering weight or loading resulting from items to be supported.
- C. Shaft Wall Studs and Accessories: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 and specified performance requirements.
1. Shaft wall assemblies shall be engineered by the manufacturer/fabricator and shall be tested by an approved testing agency for fire-rating requirements as indicated on the Drawings. Deflection and load requirements as per paragraph 2.01 above.
  2. All materials shall come from a single source.
  3. Manufacturers - Shaft Wall Studs and Accessories:
    - a. Same manufacturer as other framing materials.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Ceiling and Soffit Suspension Systems: Comply with ASTM C754.
1. Interior Ceilings and Soffits:
    - a. Carrying Channels, Furring Channels, Resilient Channels: See above.
    - b. Flat steel hangers: Zinc coated sheet steel; type and size as specified in ASTM C754 for spacing required; minimum size 1 inch x 3/16 inch by length required.
    - c. Wire Hangers: ASTM A641, Class 1 zinc coating, soft temper, sized for the specific application, but in no case less than 0.162 inch diameter.
    - d. Tie Wire: ASTM A641, Class 1 zinc coated, soft temper, sized for the specific application, but in no case less than 0.0625 inch or double strand of 0.0475 inch diameter wire.
    - e. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E488.
  2. Acoustic Isolators: (For hangers where ACT Type 1A indicated). Space in accordance with manufacturer's load carrying recommendations based on the weight of the ceiling assembly including; framing, gypsum board, acoustic panels and lighting.
    - a. Products (Basis of Design): Model AF-200 with AF Hangers by Peabody Noise Control (Kinetics Noise Control)
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. FP Clips (For securing head tracks to structural components intended to receive sprayed-on fireproofing): Galvanized steel, depth as required for thicknesses of fireproofing, size and thickness as determined by system engineering.
- F. Partition Head To Structure Connections (Deflection Head Tracks): Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as determined by the fabricator/installer's engineering. In no case shall tracks be less than 33 mils

**2.03 BOARD MATERIALS**

- A. Gypsum Board: ASTM C1396, Type X, 5/8" thickness, gypsum panels; sizes to minimize joints in place; tapered edges and ends square cut.
  - 1. Application: General use for all vertical surfaces and ceilings, unless otherwise indicated.
  - 2. Products:
    - a. ProRoc Brand Gypsum Board by CertainTeed Corp.
    - b. ToughRock Fireguard, and ToughRock FireGuard C by G-P Gypsum.
    - c. Gold Bond Brand Gypsum Wallboard by National Gypsum Co.
    - d. Sheetrock Brand Gypsum Panels by USG Corp.
    - e. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Mold-Resistant Gypsum Board: Type X, 5/8" thickness; ASTM D3273 score of 10.
  - 1. Applications: Walls and ceilings at toilet rooms, kitchen, culinary, and baking areas, Carport Vestibule adjacent to Stair 2, Multi-Lab Areas, and plumbing walls at other locations.
  - 2. Products:
    - a. ProRoc Brand Moisture & Mold Resistant Gypsum Board by CertainTeed Corp.
    - b. ToughRock Mold-Guard Type X Gypsum Wallboard by G-P Gypsum.
    - c. Gold Bond Brand XP FireShield Gypsum Board with Sporgard by National Gypsum Co.
    - d. Sheetrock Brand Mold Tough Gypsum Panels by USG Corp.
    - e. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Abuse Resistant (AR) Gypsum Board: ASTM C1396, Type X, 5/8" thickness, impact-rated gypsum panels; sizes to minimize joints in place; tapered edges and ends square cut. Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C1629.
  - 1. Application: Where indicated on the Drawings, and below 8ft AFF in circulation spaces, walkways, corridors, Lab Work spaces, student commons & display areas, demonstration crit area, café, multi-fixture restrooms, mechanical and utility spaces; except for locations where stud wall protection is provided in the form of soap block veneer, CMU veneer, wall panels / laminates, or display / tack panels.
  - 2. Products:
    - a. Gold Bond Hi-Impact Brand XP Wallboard by National Gypsum Co.
    - b. Fiberock Brand Panels--VHI Abuse-Resistant by USG Corp.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Shaftwall Coreboard: Glass Mat Faced; ASTM C1658; Type X; mold-resistant; 1 inch thick by 24 inches wide, beveled long edges, ends square cut, glass mat shaftliner gypsum panel or glass mat coreboard gypsum panel.
  - 1. Mold Resistance, ASTM D3273: Score of 10.
  - 2. Products:
    - a. DensGlass Shaftliner (mold-resistant) by G-P Gypsum.
    - b. Gold Bond Brand e2XP Extended Exposure Shaftliner, National Gypsum Co.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

**2.04 ACCESSORIES**

- A. Acoustic and Firestop Insulation: As specified in Section 07 21 00.
- B. Acoustic and Smoke Sealant: As specified in Section 07 90 05.
- C. Fire-stop Sealant: As specified in Section 07 84 00.
- D. Finishing Accessories for Wallboard: ASTM C1047, galvanized steel or rolled zinc, not less than 26 gage, unless otherwise indicated.
  - 1. General Types: As detailed or required for finished appearance.
  - 2. "J" Beads: Channel shaped with a concealed wing not less than 1-1/8" wide and an exposed wing, equal to Type 400. "J" beads may be used only where specifically identified on the Drawings or otherwise approved by the Architect. All other edge trim shall be Casing Beads.

3. Casing and Trim Beads: Channel and angle types as required, screwed into place and suitable for finishing with joint compound, equal to Type 200.
  - a. Vinyl Rip Bead L Trim is acceptable.
4. Corner Beads: Angle-shaped with 1-1/4" width wings, and perforated for screwing and joint treatment, equal to Type 103. Use Multi-Flex, steel reinforced, tape bead for corners less than or greater than ninety degrees.
5. Edge Beads: (For use at perimeter of ceilings) Channel or angle-shaped with wings not less than 3/4" wide. Exposed wing edge shall be folded flat, with bead for taping and floating, equal to Type 200.
6. Reveal Trim: Channel shaped with wings for screwing and joint treatment. Finished reveal shall be depth of wallboard by 1/2" wide.
7. Control Joints: Zinc extrusions and deep rigid PV extrusions. Type 093 and Type 093V by Trimtex for larger joints.
8. Corner Trim Type CG-1: Corner with reveal; 6063T5 aluminum. For use at ALL outside corners in corridors and circulation traffic areas without soap block and CMU veneer. Not required within rooms.
  - a. Product: Softforms SO-ER-90 by Pittcon Industries.
8. Miscellaneous Shapes: In addition to conventional cornerbead and control joints, provide other configurations indicated or as otherwise required for a complete and proper job. At exterior locations provide exterior grade rigid PVC trims.
- E. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
  1. Tape: 2 inch wide, creased paper tape for joints and corners for all interior locations.
  2. Ready-mixed vinyl-based joint compound.
- F. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish for semi-gloss painted surfaces.
  1. Product: Tuff-Hide manufactured by USG.
- G. Screws for gypsum board attachment to Steel Members Less Than 0.03 inch thickness; to Wood Members; ASTM C1002; self-piercing tapping type, Type W for wood studs and Type S for steel studs, 1-1/4" length.
  1. Coatings: Black oxide coated for general use; Zinc plated chromate for areas of potential dampness.
- H. Screws for gypsum board attachment to Steel Members From 0.033 to 0.112 Inch in thickness: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.
  1. Size, penetration and spacing shall be in strict accordance with the stud manufacturer's recommendations and the stud fabricator's engineering requirements. Penetration through joined steel materials shall not be less than 3 exposed threads or 3/8".
  2. Coatings:
    - a. General interior areas: Corrosion resistant, zinc plated with chromate complying with ASTM B633 and B117.
    - b. Potentially damp interior areas: High performance polymer coating, complying with ASTM B117; salt spray test result of no rust or other base metal corrosion after a minimum of 800 hours.
      - 1) Products: Stahlgard by ELCO, Kwik-Cote by Hilti, or approved equal.
- I. Anchorage to Substrate: Anchorage of tracks to the structure (size, penetration, type and spacing) shall be in strict accordance with the stud fabricator/installer's engineering requirements for the specific application and shall rigidly secure materials in place.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this Section to commence.

**3.02 SHAFT WALL INSTALLATION**

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
  - 1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
  - 2. Install firestopping sealant in a continuous application at the perimeter of the shaftwall in coordination with framing installation and Section 07 84 00.
  - 3. Install J-runners or E-studs on columns and beams before fireproofing installation. Remove all fireproofing over-spray from shaft wall framing before installing gypsum liner panels.
  - 4. Install studs at spacing required to meet performance requirements. C-H studs shall be sized 3/8 inch to 1/2 inch less than the floor-to-ceiling height, and installed between liner panels. Install full length E-studs or J-runners vertically at T intersections, corners, door jams, and columns. Install full length E-studs over gypsum liner panels both sides of closure panels. For openings, frame with vertical E-stud or J-runner at edges and horizontal J-runner at head and sill. Frame all openings as required to maintain structural support of wall. Isolate framing from transfer of lateral and vertical structural loading to the system. Provide movement relief type joints per manufacturer's instructions to attain proper lateral support.
  - 5. For openings, frame with vertical E-stud or J-runner at edges and horizontal J-runner at head and sill. Frame all openings as required to maintain structural support of wall.
  - 6. Support elevator hoistway door opening equipment independently of shaftwall framing system. Frame opening for elevator hoistway door frame in accordance with requirements of elevator and shaftwall manufacturer.
  - 7. Install supplemental framing and bracing to support fixtures, equipment, services, heavy trim, etc which cannot be adequately supported directly on shaftwall framing.
- B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.
- C. Horizontal Shaftwall Systems: Studs for horizontal systems shall be sized to accommodate partition dead loads as well as other applicable loads.
- D. Seal perimeter of shaft wall and penetrations with firestop sealant.
- E. Shaft Wall With Finish on One Side:
  - 1. Install gypsum board in a double layer on one side, either horizontally or vertically.
  - 2. Install the first layer of gypsum board horizontally with approved fasteners spaced 24 inches o.c. and 3 inches from all edges.
  - 3. Offset the horizontal joints minimum 12 inches from any splice joints in the liner board panels.
  - 4. Install the face layer of gypsum board parallel to the framing with approved fasteners spaced minimum 12 inches o.c. and 6 inches from all edges.
  - 5. Finish joints with tape and compound.

**3.03 FRAMING INSTALLATION**

- A. Metal Framing: Comply with ASTM C754, fabricator's engineering drawings and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated and in accordance with fabricator's engineering drawings. Suspend carrying channels from structure above at not more than 4 feet on center and within 6 inches of walls. Attach furring channels to the carrying channels at no more than 16 inches on center and within 2 inches of walls.
  - 1. Level ceiling system to a tolerance of 1/8" in 10 feet'.
  - 2. Install hangers plumb and free of contact with other objects that are not part of the supporting system for the ceiling. Install supplemental suspension members where width of ducts or other construction interferes with hanger locations.
  - 3. Provide control and expansion joints as indicated on the Drawings, or otherwise required.

4. Laterally brace entire suspension system. Reinforce openings in suspension system which interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing a minimum of 24 inches past each opening.
  5. NOTE: At the Contractor's option, drywall direct suspension systems may be used, in lieu of the carrying/furring channel system specified, subject to review and acceptance by the Architect. Direct suspension systems shall be complete with main beams, cross channels, wall angles, clips, and hangers, and shall be as recommended by the gypsum board manufacturer for the proposed installations. Systems shall be suitable for fire-rated installations as required.
  7. Fasteners for hanger wires shall be of types and sizes that will resist corrosion, and provide lasting anchorage without pullout or failure. Verify compatibility with structure to receive fasteners prior to proceeding. Do not attach hangers to steel roof deck or steel deck tabs.
- C. Runner Tracks: Install continuous tracks sized to match stud, aligned accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer and engineered design for type of construction involved.
- D. Coordination with sprayed on fireproofing: Before sprayed on fireproofing is applied, attach offset clips to steel surfaces per engineered shop drawings.
- E. Studs: Space studs at 16 inches on center unless closer spacing is required by the fabricator's engineering. Spacing shall not exceed 16 inches without the Architect's prior written authorization.
1. Extend partition framing to structure in all locations.
  2. Partitions Terminating at Structure: Provide deflection head track at all locations where metal framing is attached to or otherwise affected by the deflection of other structural building components. Secure the top of studs in such a way as to allow movement of the deflection head track with respect to the studs. Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging, or as otherwise required by the fabricator's engineering drawings.
  3. Provide minimum clear space as indicated on the partition types on the Drawings for deflection.
- F. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs of all window and door openings and shall be located not more than 2 inches from frames jambs. Two jamb studs shall be used for any opening larger than 2 feet square. Over door frames install a cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs and securely screw-attached to adjacent studs. A cut-to-length stud extending from door frame header to ceiling runner shall be positioned over the door frame.
1. Provide additional framing as required by engineered design to reinforce headers for adequate stability.
  2. Unless otherwise indicated on the Drawings, partitions above and below door and window openings shall be the same construction as adjacent partitions.
- G. Blocking: As part of the scope of Section 06 10 54 - Wood Blocking and Curbing, install wood blocking for support of:
1. Framed openings.
  2. Wall mounted cabinets.
  3. Toilet partitions.
  4. Toilet accessories.
  5. Wall mounted door hardware.
  6. Grab bars and hand rails
  7. Wall mounted countertops
  8. Folding walls, coiling doors, and window treatments
  9. AV display monitors (at AV outlet locations mounted at 66" AFF or higher)

10. Projection screens
  11. Door Hardware
  12. Mounted equipment – see Mechanical and Electrical Drawings
  13. Signage
  11. Other wall or ceiling mounted equipment
- H. Supplemental Framing: Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the walls or partitions. Where type of supplementary support is not otherwise indicated by the engineered design, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported, for firm and rigid construction.
- I. Penetration and Opening Insulation: Install firesafing insulation as required to meet firestop product manufacturer's tested assemblies for all openings and penetrations in fire-rated construction, smoke partitions and at acoustic sealing. Openings shall include steel deck flutes, structural penetrations, mechanical, electrical, piping, etc. Provide any necessary extra studs, furring channels or stick-clips to ensure that insulation will remain in proper alignment and fit around items penetrating partitions.
- J. Expansion and Control Joints: Provide studs at each side of all horizontal and vertical joints. Space studs to align with width of joints. Stuff voids between studs full with firesafing insulation at all locations.
- K. Fire-resistive Wall and Ceiling Assemblies: Where fire-rated assemblies are required, provide materials and construction identical to the Underwriters Laboratories (U.L.) tested assemblies as referenced on the Drawings.

### **3.04 ACOUSTICAL CONSTRUCTION**

- A. The following requirements shall apply to all non-fire rated ceilings and partitions indicated on the Drawings to be "Acoustical Construction". Special attention shall be paid to the proper installation of acoustical construction components.
- B. 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. Prior to installation of gypsum board, verify that acoustical insulation is in place and secure, completely filling all voids.
- C. Acoustic Sealant (at non-fire-rated construction): Install in accordance with manufacturer's instructions. Seal all cracks, joints, deck flutes, piping, conduit, duct penetrations and voids in "Acoustical Construction" air tight with sound sealing products.
1. Place continuous bead at perimeter of each layer of gypsum board.
  2. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.
- D. Acoustical Hangers: Install in accordance with manufacturer's instructions. There should be no rigid contact of the gypsum board to other elements of the building. Provide non-hardening acoustical sealant at all perimeters. Spacing and grid layout configurations per manufacturer guidelines engineered to ceiling configurations indicated per the drawings.

### **3.05 BOARD INSTALLATION**

- A. General: Inspect materials to which gypsum board is to be applied. Remedy all defects prior to installation of gypsum materials. Maintain a uniform room temperature between 55 and 65 degrees F during application and until completely dry or occupied. Provide adequate ventilation to carry off excess moisture.
- B. Field verify the layout of all walls and partitions prior to proceeding with the Work, in order to avoid dimensional errors and confirm proper placement. Verify that all required insulations are properly in place prior to covering up.



- C. Where the Drawings indicate multiple partition or wall types back-to-back, each scheduled type shall be complete. Inner layers of insulation or gypsum board shall not be omitted.
- D. Comply with ASTM C840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
  - 1. Gypsum wallboard shall be cut by scoring and breaking, or by sawing, working from the face side. Scribe neatly to projecting surfaces and fit wallboard neatly around pipes, ducts and other penetrations.
  - 2. Apply wallboard first to soffits (ceilings) then to walls. Allow 1/4" maximum space between bottom of wall sheets and floor, unless otherwise noted. Apply wallboard at interior soffits with long dimensions of board perpendicular to axis of supports.
  - 3. At ductwork and piping provide a 1/2 inch gap between the drywall and the penetrating element to minimize any vibration noise transmission to the partition. Void shall be acoustically sealed.
- E. Single-Layer Non-Rated: Install gypsum board perpendicular to framing, with ends and edges occurring over firm bearing.
- F. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- G. Fastening Gypsum Wall and Soffit Board: Wallboard shall be held in firm contact with the supports while the fasteners are being driven. Fasteners shall proceed from central portion of board towards ends and edges. Fasteners shall be driven home with the heads slightly below the surface of the board in a dimple formed by the driving tool. Care shall be taken to avoid breaking the paper face. Improperly driven fasteners shall be removed.
  - 1. In general, drywall screws shall be spaced not to exceed 16 inches o.c. At fire-resistive construction, space screws 12 inches o.c. in field and 8 inches o.c. at board perimeters, unless otherwise required by the applicable U. L. fire-rated assembly.
- H. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- I. Fire-Rated and STC Rated Assemblies: Provide assemblies continuous without interruption of wallboard layers required.
  - 1. At Intersection of exterior wall partitions: Extend fire-rated/ STC rated partitions within exterior wall stud cavity to backside of exterior sheathing. Seal intersection of wallboard per assembly type requirements.
  - 2. Intersection of non-rated/non-acoustical partitions with fire-rated/STC rated partitions: Install required wallboard layers continuous across intersection of stud partitions. Tape/seal all joints and seams as required per assemblies indicated. Butt non-rated/non-acoustical partitions to face of fire-rated/STC rated partition wallboard. Finish all seams per specifications.

### 3.06 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces, as recommended by the gypsum board manufacturer, and as indicated. Locations not indicated on the Drawings shall be located by the Contractor subject to the Architect's prior approval. Provide control joints or expansion joints where partitions, walls, ceilings, or soffits cross construction or building joints in stud framing or other supporting materials.

Note: All locations to be verified with Architect prior to installation.

- 1. At building expansion joints,
- 2. At intersections of dissimilar substrates or finish materials,
- 3. At floor lines,
- 4. At ceiling and soffit intersections with a structural element or the vertical penetration,
- 5. At ceiling wings of "L", "U" and "T" shaped ceiling areas,
- 6. At openings more than 6 feet long,

7. Adjacent to corners and intersections of walls within a distance equal to half the general control joint spacing noted above.
  8. At walls not more than 30 feet apart and ceilings over 30 feet long without relief,
  9. At walls with tile finish, no more than 16 feet apart in either direction,
  10. At exterior soffits, not more than 20 feet apart in both directions,
  11. At locations where concentrated stress or movement is anticipated,
  12. At all locations identified on the Drawings,
  13. At locations as recommended by the board manufacturer.
- B. Control joint width shall be as required to accommodate anticipated movement.
- C. Control joint in fire-rated construction shall meet requirements of the fire-resistive tested assemblies.
- D. Wall boards shall be discontinuous at the joint, sealant shall fill the gap and control joint trim shall be fastened at both flanges along the entire length of the joint.
- E. Corner Beads: Install with screws at external corners, using longest practical lengths.
- F. Casing Beads: Install at locations where gypsum board abuts dissimilar materials and as indicated.
- g. Special Shapes: Install in strict accordance with the manufacturers printed instructions and recommendations. Field verify all dimensions and conditions. Components of maximum practical size shall be used so that an absolute minimum number of end joints occur. Enclosures shall be engineered to withstand all applicable loads. Provide all internal brackets, posts and bracing required. At fire-rated construction, provide a continuous layer of gypsum board below the layer of gypsum board with special shapes to maintain the integrity of the fire-rated construction.

### 3.07 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 5: On walls that are double height (2-story) tall and pass over the wall-to-floor deck transition; and other areas indicated per the Drawings.
  2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  2. Level 3: On walls to receive protective finish (soap CMU, wall protection, etc.), areas above the ceiling or not accessible in the completed construction, and temporary partitions viewed by building occupants.
- 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.
  2. Taping, filling and sanding is not required at base layer of double layer applications, except as required in fire-rated applications.
- D. All wallboard in fire-rated and smoke sealed construction shall be sealed when penetrated by pipes, conduits, wire, structure, etc.
1. Smoke sealed assemblies shall be sealed tight to abutting construction with sealant products.
  2. Fire-rated assemblies shall be sealed tight to abutting construction with firestopping products in order to provide continuous, uninterrupted fire protection.
- E. 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.

### 3.08 MARKING OF FIRE AND SMOKE RESISTIVE CONSTRUCTION

- A. Prepare stenciled signs for painted marking of all fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions as identified on the Code Analysis Drawings, above accessible

ceilings, in attics and in accessible concealed floor spaces, at intervals not exceeding ten (10) feet measured horizontally. Where wall partitions are exposed finish to underside of deck above coordinate placement of markings in field with Architect.

1. Lettering shall be 3 inches high, of contrasting color to the application surface.
2. Sign text shall be as follows, as applicable:
  - a. FIRE BARRIER - 2 HR - PROTECT ALL OPENINGS
  - b. FIRE BARRIER - 1 HR - PROTECT ALL OPENINGS
  - c. SMOKE PARTITION - PROTECT ALL OPENINGS

### **3.09 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

**SECTION 09 51 00**  
**ACOUSTICAL CEILINGS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical tiles.
- C. Existing suspended ceiling tiles to be removed shall be recycled by the acoustic tile manufacturer. See Section 01 74 19 - Construction Waste Management and Disposal.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 31 00 - Steel Deck: Placement of special anchors or inserts for suspension system.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Recycling fiber ceiling tiles to be removed.
- C. Section 09 21 16 - Gypsum Board Assemblies: Drywall soffits.
- D. Division 21 - Fire Suppression.
- E. Division 23 - HVAC.
- F. Division 26 - Electrical.

**1.03 REFERENCE STANDARDS**

- A. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2007.
- B. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2008.
- C. ASTM E580 - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2011.
- D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.
- E. CAL - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at [www.chps.net/](http://www.chps.net/).
- F. GEI - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at [www.greenguard.org](http://www.greenguard.org)
- G. UL - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**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.
- B. Do not install acoustical tiles until after interior wet work is dry.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples:
  - 1. Submit samples 4x4 inch minimum in size, of selected acoustical tiles.
  - 2. Submit samples 8 inches minimum long, of suspension system main runner.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of Project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Acoustical Tiles: Quantity equal to 5 percent of total installed.

3. Extra stock shall match products installed and shall be packaged in protective covers for storage and identified with labels describing contents. Store as directed by the Owner. Send written notice to the Architect identifying the quantity and location of extra tile furnished. The tile shall not be used by the Contractor for corrective work during the warranty period.

#### **1.06 QUALITY ASSURANCE**

- A. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance indicated.
- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum fifteen years documented experience.
- C. Acoustical Tile Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum fifteen years documented experience.

#### **1.07 FIELD CONDITIONS**

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of no more than 70 percent prior to, during, and after acoustical unit installation. Acoustic materials shall reach room temperature and moisture content prior to installation. Operate ventilation system for not less than 48 hours beginning acoustical panel ceiling installation.

### **PART 2 PRODUCTS**

#### **2.01 ACOUSTICAL TILES**

- A. Manufacturers:
  1. Basis of Design: Armstrong World Industries and CertainTeed as indicated below.
  2. Acceptable manufacturers, products subject to review with substitutions process:
    - a. USG.
    - b. CertainTeed Corp.
    - c. Rockfon
- B. Acoustical Tile Type ACT-1: Painted mineral fiber, ASTM E 1264 Type IV, Class A.
  1. Type ACT-1A: Same acoustical ceiling product specified here-in. Designation indicated represents inclusion of an acoustical gypsum ceiling assembly above the acoustical ceiling plane. Gypsum ceiling assembly scope of work included under Section 09 21 16. See Drawings for additional details and clarifications.
  2. Locations: As indicated on the Drawings.
  3. VOC Content: Certified as Low Emission by one of the following:
    - a. GreenGuard Children and Schools.
    - b. Product listing in the CHPS Low-Emitting Materials Product List.
  4. Size: 24 x 24 inches.
  5. Thickness: 3/4 inches.
  6. Composition: Wet felted.
  7. Light Reflectance: not less than 0.90.
  8. NRC: not less than 0.75
  9. Ceiling Attenuation Class (CAC): not less than 35.
  10. Edge: Beveled tegular.
  11. Surface Color: White.
  12. Surface Pattern: Non-directional fissured.
  13. Products: ULTIMA Lay-In and Tegular # 1911 by Armstrong World Industries.
    - a. Substitutions: See Section 01 60 00 - Product Requirements.
  14. Suspension System: Exposed grid Type 1, color white.
- C. Acoustical Tile Type ACT-2: Painted mineral fiber, ASTM E 1264 Type III, Class A.
  1. Applications: Where indicated on the Drawings.
  2. VOC Content: Certified as Low Emission.
  3. Size: 24 x 24 inches.

4. Thickness: 3/4 inches.
5. Composition: Wet felted.
6. NRC: 0.55.
8. Ceiling Attenuation Class (CAC): 35.
9. Edge: Square lay-in.
10. Surface Color: Tech Black.
11. Surface Pattern: Medium texture.
12. Products: Fine Fissured by Armstrong World Industries.
  - a. Substitutions: See Section 01 60 00 - Product Requirements.
13. Suspension System: Exposed grid Type 1, color black.

## **2.02 SUSPENSION SYSTEMS**

- A. Manufacturers: Same as for acoustical tiles.
- B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- C. Exposed Steel Suspension System Type 1: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.
  1. Profile: Tee; 15/16 inch wide face.
  2. Construction: Double web.
  3. Finish: Factory painted, color as indicated above.
  4. Products:
    - a. Prelude XL 15/16 by Armstrong World Industries, Inc..
    - b. Classic Stab by Certainteed.
    - c. Donn DX by USC.
- D. Specialty Exposed Aluminum Suspension Perimeter System: Extruded 6063-T5 aluminum; system perimeter braces as/if required; splice plates, clips and brackets as required.
  1. Perimeter Trim Size: 6 inches, unless otherwise indicated on the Drawings.
  2. Configurations: Straight.
  3. Finish: White.
  4. Product: Axiom Classic Trim by Armstrong World Industries, Inc.

## **2.03 ACCESSORIES**

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
  1. Hanger wire: Galvanized soft temper, pre-stretched steel wire, per ASTM A641, with yield strength of at least 3 times design load, but not less than 12-gage diameter.
- B. Perimeter Moldings: Same material and finish as grid, size suitable for suspension system and ceiling unit profile. Molding shall be suitable for use in fire-rated ceiling systems.
  1. At Exposed Grid: 7/8" L-shaped molding for mounting at same elevation as face of grid.
- C. Accessory Moldings: Inside and outside corner pieces, and where applicable, matching fillers at bullnose corners.
- D. Other Accessories: As required, specifically designed for intended use with suspension components employed, in accordance with ASA specifications. Provide all special hardware required for fire-rated, sloped and vertical installations, as necessary to comply with applicable codes and standards of good practice.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify as-built conditions before starting work. Proceed with installation only after unsatisfactory conditions have been corrected.

- B. Verify that layout of hangers will not interfere with other work.
- C. Any questions or conflicts shall be brought to the attention of the Architect prior to proceeding with the Work.

### **3.02 INSTALLATION - SUSPENSION SYSTEM**

- A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M, and manufacturer's instructions and as supplemented in this Section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- D. Provide hanger clips during steel deck erection. Do not support ceiling directly from steel roof deck or tabs. Provide additional hangers and inserts as required. Connect hanger wires directly either to structure, or to inserts, eye screws or other devices that are secure and appropriate for the substrate. All hangers and supports shall be secured in such a way that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Install hangers plumb. Angle hangers only where required to miss obstructions. Any non-plumb hangers that result in horizontal forces shall be braced. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three (3) tight turns. Secure bracing wire to ceiling suspension members and to supports with a minimum of four (4) tight turns.
- G. 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. Alternatively, install supplemental suspension members and hangers in the form of trapeze or equivalent devices, sized to support ceiling loads.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
  - 1. Provide supplemental supports for grid where cubicle curtain tracks are attached to grids shall support a vertical test load of 50 lbs without visible deflection or damage to supports and safely support moving loads.
- J. Do not eccentrically load system or induce rotation of runners.
- K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
  - 1. Use longest practical lengths.
  - 2. Overlap corners.
- L. Provide additional hangers for the suspension system at each corner of light fixtures if independent support of fixtures is not required by Electrical documents. All light fixtures in excess of 56 lb shall be independently supported.
- M. Provide additional hangers for air terminal units or services weighing more than 20 lb but less than 56 lb in addition to positively attaching them to the ceiling suspension system. Units weighing more than 56 lb shall be independently supported to the building structure.
- N. Provide framing for recessed light fixtures, air outlets, diffusers, etc. See Architectural, Mechanical, and Electrical Drawings.
- O. Where approved by the Architect and where field conditions require lowering a portion of a ceiling to conceal piping or ductwork, the ceiling contractor shall provide a ceiling height change and transition at no additional cost to the Owner.

**3.03 INSTALLATION - SUSPENSION SYSTEM SEISMIC REQUIREMENTS**

- A. Provide suspension, bracing, and attachments in strict accordance with ASCE 7, current edition, ASTM C635, ASTM C636 and CISC Recommendations For Direct-Hung Acoustical Tile and Lay-in Panel Ceilings, most recent edition. The requirements for seismic bracing shall generally include, but not be limited to the following features:
  - 1. For Seismic Design Categories A, B and C: CISC requirements for Seismic Zones 0-2 and provisions in ASCE 7 Section 13.5.6.2.1.
    - a. For spaces less than 144 sq. ft. in size, no seismic restraint is required.
    - b. For spaces 144 sq. ft. and greater in size, in general provide:
      - 1) The total weight of the suspension system (grid), tiles, and other ceiling components (light fixtures, air terminals, etc) shall be no greater than 2.5 PSF, or other ceiling components shall be independently supported.
      - 2) The suspension system (grid) shall be designed, tested, and rated for ultimate load capacity as per ASCE 7.
      - 3) All sides of the space shall have tees cut back 3/8" at the perimeter to accommodate movement and shall not be attached to the perimeter molding. Perimeter moldings shall provide a minimum supporting ledge of 7/8" for tees or all tees shall be independently supported within 8" of the perimeter. All ends of main runners and cross members shall be tied together or shall have stabilizer/spacer bars attached to members to prevent spreading. Permanent attachment (i.e. pop rivets) for grid alignment shall not be permitted.
      - 4) Openings for sprinkler heads shall provide a minimum of 1/4" clearance on all sides of the piping. All other ceiling penetrations shall provide a minimum of 3/8" clearance.

**3.04 INSTALLATION - ACOUSTICAL TILES**

- A. Owner's Inspection: All areas above suspended ceilings shall be inspected by the Owner prior to installation of ceiling tiles. The Contractor shall obtain written permission from the Owner to proceed with ceiling tile installation. Failure to follow this procedure shall result in removal and reinstallation of ceiling panels to facilitate inspection at no additional cost to the Owner.
- B. Install acoustical tiles in accordance with manufacturer's instructions.
- C. Fit acoustical tiles in place, free from damaged edges or other defects detrimental to appearance and function.
- D. Lay directional patterned tiles with pattern parallel to longest room axis.
- E. Fit border trim neatly against abutting surfaces.
- F. Install tiles after above-ceiling work is complete. Do not install tile until mechanical and electrical systems are tested and complete and all firestopping and smoke seals have been inspected and accepted.
- G. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- H. Cutting Acoustical Tile:
  - 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.
- I. Where round obstructions occur, provide preformed closures to match perimeter molding.

**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. Clean soiled exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members as recommended by the manufacturer. Remove and replace damaged ceiling components that cannot be successfully cleaned and repaired.

**END OF SECTION**

**SECTION 09 54 23**  
**LINEAR METAL CEILING PANELS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Ceiling grid mounted linear metal acoustic panel system.
- B. Suspended metal mounting grid system, trim and accessories.
- C. Supplementary acoustical insulation over system units.

**1.02 REFERENCE STANDARDS**

- A. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; Current Edition.
- B. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; Current Edition.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; Current Edition.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate work of this Section with installation of tubular skylights, mechanical, fire protection and electrical components and with other construction activities affected by work of this Section.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Furnish for component profiles, materials, perforation pattern, finish, perimeter and integral trim.
- C. Shop Drawings: Indicate location of mechanical and electrical components, details of junction with dissimilar materials, and points of suspension.
- D. Samples: Submit samples 12 inches long illustrating selected color and finish of exposed to view components.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years' experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept factory-finished products on site in manufacturer's unopened factory packaging only; reject opened packages.
- B. Protect factory-finished products from damage to appearance by storing products in manufacturer's unopened factory packaging in dry storage area.

**1.07 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.

**PART 2 PRODUCTS****2.01 LINEAR METAL CEILING PANELS**

- A. Linear Metal Ceiling Panel System: Micro-perforated, smooth panels with acoustical infill, mounting grids, trim and accessories as required to provide a complete system for interior and exterior applications as indicated per the Drawings.

1. Products: Lay-In Metal Pans by Steel Ceiling Inc.
  2. Substitutions: See Section 01 60 00 - Product Requirements.
  3. Material:
    - a. Exterior Applications: Unperforated electro-galvanized steel, 0.028 inch thickness.
    - b. Interior Applications: Micro-perforated electro-galvanized steel, 0.028 inch thickness.
      - 1) Perforation Pattern: Selected by Architect from manufacturer's standard.
  4. Size:
    - a. Lengths: 48 inches.
    - b. Width: 24 inches.
  5. NRC: 0.90.
  6. Mounting: Drywall Grid System Main Beam and Clips by panel manufacturer.
  7. Fire-Rating: Class A.
  8. Edge: Reveal edge.
  9. Sight-exposed Surface Finish: Wood-look finish, from manufacturer's standard range.
- B. Edge Molding, End caps, and Splices: Same material, thickness, and finish as panels.
- C. Grid Members: Hot-dipped galvanized steel sheet, ASTM A653, with G90/Z275 coating; formed to resist imposed loads and to provide attachment for linear panels and accessories. Intermediate duty; 15/16".
- D. Insulation: ASTM C 665, 2" thick glass fiber insulation wrapped in flame retardant black polyfilm.

## **2.02 FABRICATION**

- A. Shop cut linear panels to accommodate skylight, mechanical, fire protection and electrical items.
- B. Factory-form internal and external corners of same material, thickness, finish, and profile to match exposed linear panels; back brace internal corners.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work. Verify that field measurements are as indicated.

### **3.02 INSTALLATION**

- A. Ceiling Panels:
1. Install ceiling panels and other system components in accordance with manufacturer's instructions.
  2. Install at interior locations tight to concealed construction.
  3. Install edge moldings at junctions with other finishes and at vertical surfaces; use maximum piece lengths.
  4. If site cutting is required, exercise care when cutting sight-exposed finished components to ensure surface finish is not defaced.
- B. Insulation: Install above panel members; fit tight between grid members.

### **3.03 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.
- C. Maximum Variation From Dimensioned Position: 1/4 inch.

### **3.04 CLEANING**

- A. Clean polished surfaces, and replace damaged or abraded components.

**END OF SECTION**

**SECTION 09 65 00  
RESILIENT FLOORING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Resilient tile flooring.
- B. Resilient sheet flooring.
- C. Resilient base.
- D. Resilient stair flooring and nosings.
- E. Substrate patching and leveling as required.
- F. Installation accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors. Concrete Moisture Vapor Reduction Admixtures.
- B. Section 09 05 61 – Common Work Results for Flooring Preparation.

**1.03 REFERENCE STANDARDS**

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.
- B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2012.
- D. ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- E. ASTM F2169 - Standard Specification for Resilient Stair Treads; 2012.
- F. ASTM F2195 - Standard Specification for Linoleum Floor Tile; 2013.
- G. CAL - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS).
- H. GEI GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute.
- I. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2011.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Samples:
  - 1. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
  - 2. Verification Samples: Submit samples, 6 x 6 inch in size illustrating colors and patterns for each resilient flooring product specified.
- D. Certification and Field Reports:
  - 1. Prior to installation of flooring, submit written certification by each flooring manufacturer that condition of sub-floor is acceptable.
  - 2. Submit copies of manufacturer's technical representative's field reports for each field visit.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials.

- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, and Section 01 78 00 - Project Close-out, for additional provisions.
  2. Extra Wall Base: 2 percent of each type and color.
  3. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.
  4. Materials shall be provided in unbroken packaging when job is complete. Notify the Architect in writing of the quantity and location of materials furnished. These materials may not be used by the Contractor for corrective work during the warranty period.

#### **1.05 QUALITY ASSURANCE**

- A. All resilient flooring shall comply with ASTM E84 Flame Spread Rating of Class II (75 or less) and ASTM E662 Smoke Developed (450 or less) unless otherwise indicated.
- B. All colors shall match as directed by the Architect and shall be from the same "color run" or "dye lot".
- C. All adhesives shall be as recommended by the flooring product manufacturer and shall be formulated low VOC and asbestos-free.

#### **1.06 MOCK-UPS**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Construct mock-up for each type of flooring transition to include leveling and shimming products, flooring on both sides of the transition and transition strips. Flooring transitions shall provide smooth, bump-free transitions to facilitate movement of wheeled equipment and minimize tripping hazards.
  1. Approved mock-ups may remain as part of the Work.

#### **1.07 PRE-INSTALLATION MEETING**

- A. Convene a pre-installation meeting after the results of slab testing are available and at least two weeks before starting work of this Section; require attendance by the Contractor, a technical representative from each flooring manufacturer, flooring installer, Architect, to review slab moisture levels, floor surface conditions and preparation requirements, materials, installation procedures and coordination of related work.
  1. A field report summarizing the findings and recommendations from this meeting shall be issued by the technical representatives and copied to the Architect.
  2. Written certification from each flooring manufacturer that condition of sub-floor is acceptable for flooring installation shall be issued and copied to the Architect.
  3. If a slab sealer or other remedial work is required to make the condition of the sub-floor acceptable for the flooring installation, slab preparation and slab sealer product installation shall be field reviewed by the manufacturer's technical representatives and application tested (thickness, adhesion, etc) to confirm compliance with product recommendations.

#### **1.08 DELIVERY, STORAGE, AND PROTECTION**

- A. Protect roll materials from damage. Store roll material as directed by the manufacturer. All resilient flooring materials shall be stored in undamaged condition as packaged by the manufacturer, with manufacturer's seals and labels intact.
- B. 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.

#### **1.09 FIELD CONDITIONS**

- A. See Section 01 00 00 - General Requirements, for minimum indoor air quality improvement requirements.
- B. Maintain temperature in storage area between 65 degrees F and 90 degrees F.

#### **1.10 WARRANTY**

- A. See Section 01 78 00 - Project Close-out, for additional requirements.

- B. Provide manufacturer's product warranty. See product listings for term.

## **PART 2 PRODUCTS**

### **2.01 TILE FLOORING**

- A. Textile Composite Tile Type RF-1: Cushioned polyester felt backing thermally fused to a face fiber wear layer.
1. Critical Radiant Flux, ASTM E648: Class 1, minimum 0.45 watt per. sq. cm.
  2. Smoke Generation, ASTM E662: Pass, 450 or less.
  3. Air Quality Certification: CRI Green Label Plus.
  4. Size: See Finish Legend.
  5. Thickness: 0.185 inch.
  6. Wear Layer: Solution Dyed Polyester.
  7. Backing: Polyester Felt Cushion.
  8. Total Weight: 4.5 - 5.2 oz/sq ft.
  9. Patterns and Colors: See Finish Legend.
  10. Warranty: Lifetime product performance, colorfastness to light, stain removal and static protection. Lifetime backing edge ravel, delamination and dimensional stability.
  11. Basis of Design: Flotex Linear by Forbo
    - a. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Vinyl Composite Tile Type VT-1:
1. Critical Radiant Flux, ASTM E648: Class 1, minimum 0.45 watt per. sq. cm.
  2. Smoke Generation, ASTM E662: Pass, 450 or less.
  3. Size: 36 x 36 inches.
  4. Thickness: 0.125 inch.
  5. Finish: Satin, smooth and flat with neutral reflectance characteristics.
  6. Total Weight: 10.12 lbs per tile.
  7. Patterns and Colors: See Finish Legend.
  8. Warranty: Manufacturer standard (1) one year limited warranty.
  9. Basis of Design: TV Tile by Harlequin Floors
    - a. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 SHEET FLOORING**

- A. Vinyl Sheet Flooring Type SV-1: Slip-resistant; integrated bacteriostat; ASTM F1303.
1. Critical Radiant Flux, ASTM E648: Class 1, minimum 0.45 watt per sq cm.
  2. Smoke Developed, ASTM E662: Pass, 450 or less.
  3. Slip Resistance, ASTM D2047: Dry 0.92 dry / Wet 0.88.
  4. Sustainable Properties: Phthalate-free, contains rapidly renewable bio-based content, 100 percent recyclable, SCS FloorScore Certified.
  5. Total Thickness: 3.0 mm (0.12 inches) with non-directional pattern and slip retardant particulate suspended evenly throughout the product thickness.
  6. Sheet Width: 79 inches.
  7. Welded seams.
  8. Static Load Limit, ASTM F970: 2,000 psi.
  9. Type ICB-1: Integral coved base with cap strip, where scheduled.
  10. Backing: Non-woven polyester/cellulose, glass fiber reinforcement.
  10. Colors / Patterns: See Finish Legend.
  11. Warranty: (12) Twelve years, manufacturer's standard limited warranty.
  12. Products: Stronghold 30 by Altro.
    - a. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 STAIR COVERINGS**

- A. Stair Treads Type RF-2: Rubber Tread; FS RR-T-650; nosing not less than 1-5/8 inch deep.
1. Critical Radiant Flux, ASTM E648: Class 1, minimum 0.45 watt per sq cm.

2. Size: Full width and depth of stair tread in one piece. Provide equal length units for stairs exceeding manufacturer's maximum manufactured lengths.
3. Style: Contrasting color nosing strip.
4. Texture and Colors: See Finish Legend.
5. Products:
  - a. Satura by Nora
  - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Stair Landing Tile RF-2: Rubber
  1. Critical Radiant Flux, ASTM E648: Class 1, minimum 0.45 watt per sq cm.
  2. Size: 39.5" x 39.5".
  3. Texture and Colors: See Finish Legend.
  4. Products:
    - a. Satura by Nora.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.04 RESILIENT BASE**

- A. Resilient Base Type RB-1, -2 & -3: Type TP, rubber coated PVA, thermoplastic; pre-molded outside corners.
  1. Provide cove base at resilient flooring.
  2. Fire Resistance, ASTM E84: Class A.
  3. Critical Radiant Flux, ASTM E648: Class 1; minimum 0.45 watt per sq cm.
  4. Height: 4 inches as indicated in the Finish Legend.
  5. Thickness: 0.125 inch thick.
  6. Finish: Satin.
  7. Length: Roll.
  8. Colors: See Finish Legend.
  9. Warranty: Two years.
  10. Products:
    - a. Traditional Rubber Wall Base by Johnsonite, Inc.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.05 ACCESSORIES**

- A. Subfloor Patching Compounds: Cementitious type recommended by adhesive material manufacturer and flooring manufacturer. Calcium sulphate, plaster or gypsum based toppings, leveling and patching compounds are not acceptable.
  1. Slope / Build-up Product: SD-P by Ardex.
- B. Self-Leveling Underlayment: See Section 09 05 61 – Common Work Results for Flooring Preparation.
- C. Slab Moisture Barrier System: Epoxy slab coating for moisture vapor remediation and primer coat. System shall be surfaced with a self-leveling cementitious underlayment for resilient finish flooring.
  1. Moisture Vapor Control Coating: VOC regulation compliant; Low odor. VOC content <10 g/l
  2. Substrate preparation and conditions shall be reviewed and confirmed with the manufacturer's technical representative prior to installation.
  3. Products: As recommended by each flooring manufacturer for each flooring product.
    - a. VAP I 2000 coating, VAP I 06 primer by Koster.
    - b. Defender coating, MP Primer by Chapco, a division of H.B. Fuller.
    - c. AquArmor MCS by General Polymers - Sherwin Williams.
    - d. Moisture Limiter by Forbo.
- D. Primers, Adhesives, and Seaming Materials: Waterproof; low VOC types recommended by flooring manufacturers.
- E. Flooring Transitions:

1. At resilient flooring to resilient flooring transition: No transition strip. Use scribing felt at unequal thickness products.
  2. Concrete to resilient flooring: Vinyl transition strip.
  3. Products:
    - a. Reno Ramp by Schluter-Systems.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Adhesives: Low VOC type recommended by flooring manufacturers for project conditions.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Floor tile pattern layouts shall be as designed by the Architect. Flooring shall be placed so that fields or patterns center on area. The Architect shall select the pattern (direction of grain) to be used. See Interior Design drawings. ID drawings are created for the purpose of bidding and patterns are subject to change within similar percentage of pattern indicated.
- B. Base shall be continuous as scheduled unless otherwise approved by the Architect. Base shall return to door or window frames at all openings.
- C. Unless otherwise approved by the Architect, flooring materials shall extend below fixed casework and millwork to cover the entire floor areas. Where integral base is provided, it shall extend behind casework to form a watertight base.
- D. Work shall not be started until work of other trades, which goes through resilient flooring, has been completed.
- E. Thoroughly clean the flooring substrate.

### **3.02 EXAMINATION AND FIELD TESTING**

- 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. Concrete Slabs: Verify substrate conforms to ASTM F710. Perform adhesive bond tests and water absorption tests.
- 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. Substrate surface pitch shall be confirmed with a laser level for conformance to pitch requirements. Report results to Architect and Owner.
- D. Contractor shall test concrete slab surfaces prior to installation of any flooring. Test results shall be made available to the Owner, Architect and flooring contractor. Determination of acceptability by the flooring and adhesives manufacturers shall be submitted to the Architect. Contractor shall obtain instructions from flooring manufacturers if test results are not within their recommendation limits. Testing shall include:
  1. Internal relative humidity rates per ASTM F1869
  2. Alkalinity, pH rates per ASTM F710.
  3. Scientific Testing of Concrete Moisture Vapor Reduction Admixtures specified in Section 03 30 00.
- E. If remedial work is recommended by the flooring and adhesive manufacturers, the preparation for and installation of moisture control coatings shall be inspected by the product manufacturer's technical representative and tested for adequacy by the Contractor prior to resumption of the flooring installation.
- F. Any conditions that could adversely affect the flooring installation shall be corrected, prior to proceeding with the Work. Commencement of the installation of flooring shall be considered acceptance of the concrete slab as being suitable for the intended application. Any conditions that could adversely affect the flooring installation shall be brought to the Contractor's attention, for resolution, prior to proceeding with the Work.



**3.03 PREPARATION**

- A. Prepare subfloor surfaces as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor patching compound to achieve smooth, flat, hard surface. Provide transition strips directly over construction joints between new and existing floor slabs where applicable.
- C. Resilient flooring shall not be installed over floors that have been treated with chemical compounds. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by the manufacturer. Do not use solvents.
- D. Subfloor surfaces shall not vary more than plus or minus 1/8" in any 10' dimension. Neither shall they vary at a rate greater than 1/16" per running foot. Leveling compound shall be used for larger areas.
  - 1. For subfloor surfaces intended to slope to floor drains, build-up product shall be installed precisely to create proper pitch. Floor pitch shall be laser verified with results submitted to the Architect.
- E. Flooring work shall not be started until the work of other trades, which penetrates flooring area, has been completed.
- F. All flooring surface transitions shall be as smooth and level as possible. Resilient flooring shall be laid flush with all adjacent flooring materials. Fill edge of subfloor adjacent to higher flooring with approved crack and leveling filler as required to provide a smooth transition. Filler shall be feathered back to subfloor a minimum of one foot for each 1/16" of thickness.
- G. Prohibit traffic until filler is cured.

**3.04 INSTALLATION**

- A. Starting installation constitutes acceptance of sub-floor conditions. Installation surfaces shall be clean.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place; press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install terminations as identified above. In general, flooring substrates shall be shimmed to provide a level transition between flooring surfaces without transition strips.
- H. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- I. Scribe flooring to walls, columns and other appurtenances to produce tight joints.
- J. At movable partitions, install flooring under partitions without interrupting floor pattern.

**3.05 TILE FLOORING**

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise. Lay tile in pattern and grain direction as directed by the Architect.

**3.06 RESILIENT BASE**

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints. Install wall base in lengths as long as without gaps at seams and with tops of adjacent pieces aligned. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

- B. Miter internal corners. At external corners, use premolded units. Special attention shall be paid to firmly securing base around bull nose corners.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions. Install base on all built-in cabinets, locker bases, etc., unless specifically indicated otherwise. Base shall extend around all sides of cabinetwork.

### **3.07 STAIR COVERINGS**

- A. Stairs shall be filled with crack and leveling filler as required to properly form and level. Fill and grind tread and nosings as required.
- B. Install stair coverings in one piece for full width and depth of tread. A full depth tread shall be provided for the top nosing of all stairs.
- C. For stair widths that exceed the maximum manufactured length of treads, splice locations shall be reviewed with and approved by the Architect.
- D. Edges shall be firmly cemented into place. Special attention shall be paid to ensuring that nosings are tightly fitted and secure.
- E. Adhere over entire surface. Fit accurately and securely.

### **3.08 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.
- B. Manufacturer's Inspections: Following the requirements for pre-installation field meeting and sub-floor preparations for the flooring installation, inspections shall be made by technical representatives of each flooring system manufacturer at the following points in the flooring installation:
  - 1. First, early in the installation process to ascertain that flooring procedures and details discussed at the pre-construction meeting are being followed.
  - 2. Second, at the completion of the installation, to review the completed installation. Manufacturer's technical representative's field reports for each site visit shall be copied to the Owner and Architect.

### **3.09 CLEANING**

- A. Immediately after installation, remove excess adhesive and other blemishes from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.

### **3.10 PROTECTION**

- A. Prohibit traffic on resilient flooring for 48 hours after installation. Protect flooring against marks and damage from construction operations utilizing methods recommended by the flooring manufacturer. Cover tiles with undyed building paper until inspection for Substantial Completion.

**END OF SECTION**

**SECTION 09 84 00**  
**ACOUSTIC ROOM COMPONENTS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Painted sound absorption panels and mounting accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 – Hollow Metal Doors and Frames: Frames scheduled to receive acoustic panels.

**1.03 REFERENCE STANDARDS**

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
- C. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2005.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products including certified laboratory test reports and other data required to show compliance with these specifications.
- C. Shop Drawings: Fabrication and installation details.
- D. Samples: Submit 11-1/2 by 11-1/2 inch samples of representative panel with factory detailed edge, and representative samples of mounting devices.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company with not less than 5 years of experience in manufacturing acoustical products similar to those specified.

**1.06 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.
- B. Do not deliver materials to the building until wet and dust generating work, such as concrete, drywall finishing and plaster is completed and cured.
- C. Store panels flat, in dry, well-ventilated space; do not stand panels on end.
- D. Protect panel edges from damage.

**PART 2 PRODUCTS****2.01 ACOUSTICAL WALL PANELS**

- A. Acoustic Panels:
  - 1. Fire Resistance, ASTM E84: Flame spread index of 25 or less and Smoke developed index of 450 or less.
  - 2. Core Fiberglass Density: 6-7 lb/cu ft.
  - 3. Core laminated with 1/8 inch, 16 - 20 pcf molded glass fiber.
  - 4. Noise Reduction Coefficient (NRC): 0.90 average
  - 5. Edges: Half-bevel.

6. Panel Width: As indicated on the drawings.
7. Panel Thickness: 1 1/2 inches.
8. Panel Lengths: Maximum length to minimize seams. See Drawings.
9. Mounting: Adhered to interior face of metal frames as indicated.
10. Finish: Custom paint color selected by architect.
11. Warranty: Manufacturer standard 3-year limited warranty.
12. Product:
  - a. New Dimensions Acoustical Wall Panels by Conwed Designscape / Wall Technology.
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 FABRICATION**

- A. General: Fabricate panels to sizes and configurations indicated, with facing installed without sagging, wrinkles, blisters, or visible seams.
- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 in for thickness, overall length and width, and squareness from corner to corner.

**2.03 ACCESSORIES**

- A. Back-Mounting Accessories: Manufacturer's recommended adhesive for application indicated.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine substrates for conditions detrimental to installation of acoustical panels. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. Install acoustical panels in locations indicated, following installation recommendations of panel manufacturer. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
- B. Install panels to construction tolerances of plus or minus 1/16 in for the following:
  1. Plumb and level.
  2. Flatness.
  3. Width of joints.
- C. All panel handling shall be done using clean white gloves.

**3.03 CLEANING**

- A. Clean facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
- B. Remove surplus materials, trimmed portions of panels, and debris resulting from installation.

**3.04 PROTECTION**

- A. Provide protection of installed acoustical panels until completion of the work.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

**END OF SECTION**

**SECTION 09 90 00  
PAINTING AND COATING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. All necessary surface preparation.
- B. Field application of paints.
- C. Scope: Finish all exterior and interior surfaces exposed to view, unless fully factory-finished.
  - 1. Steel lintels and ledge angles.
  - 2. Mechanical and Electrical:
    - a. In finished areas, paint all exposed infrastructure, including insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
    - b. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
    - c. On the roof and outdoors, paint all equipment that are exposed to weather or to view, including that which is not factory-finished. Finish to match roof color, as reviewed and accepted by Architect.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically so 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, and operating parts of equipment.
  - 5. Roofing and flashing.
  - 6. Floors, unless specifically so indicated.
  - 7. Ground Face CMU, unless specifically so indicated.
  - 8. Glass.
  - 9. Acoustical materials, unless specifically so indicated.
  - 10. Concealed pipes, ducts, and conduits.
- E. Painting of exposed piping, pipe insulation, ductwork, conduit, wire mold, etc.
- F. Field testing compatibility of new paint with shop-applied primers, or finishes to be covered.
- G. The painting subcontractor shall examine all the Sections of the Specifications and shall thoroughly familiarize himself with all their provisions regarding painting and finishing.
- H. NOTE: All interior wood for stained finish shall be shop finished. See Division 6. All interior painted wood shall be shop primed and field painted.
- I. Finish Schedule: Refer to the Interior Design Drawings, Finish Legend and Schedule for color selections and product types.

**1.02 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; 2012.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. GreenSeal GS-11 - Paints.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "acrylic enamel").
  - 2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
  - 3. Manufacturer's installation instructions.
- C. Product Data: Submit data on all finishing products, including VOC content. List each product and cross-reference it to the specification's Part 2, Products.
- D. Samples: Submit initial selected colors on paper card, 8x8 inch in size, minimum. Follow-up with 24"x24" drywall sample for Owner and Architect review.
- E. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
  - 3. Label each container with color in addition to the manufacturer's label.
- G. Following the satisfactory completion of all painting, the Contractor shall prepare and submit to the Architect typed copies of a complete list of all materials and colors used for the Work. This list shall be sufficiently clear and complete for the Owner's use in purchasing materials required for touch-up and repainting.

**1.04 QUALITY ASSURANCE**

- A. Applicator Qualifications: Company specializing in performing the work of this Section with minimum five years experience and shall have completed similar painting system applications with a record of successful in-service performance.
- B. Material Data Sheet product information for all painting products shall be kept on file on the job site before work begins.
- C. All materials shall be thoroughly stirred. No materials shall be reduced or changed in any way. Any tinting or matching of colors shall be done to the satisfaction of the Architect. In all cases a sample shall be applied on the job and Architect must approve before work is actually begun. Execute work in accordance with manufacturer's printed instructions.

**1.05 MOCK-UP**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide a finished sample room, complete or in part, with all finish items completed in accordance with the Specification and in selected colors. Items not accepted shall be re-finished. When accepted, they shall serve as a standard for workmanship, appearance and materials for similar areas throughout this Project. Note colors may be changed after review of the Mock-up with no additional cost to the Owner.
- C. Accepted mock-ups may remain as part of the Work.

**1.06 PRE-INSTALLATION MEETING**

- A. A pre-installation meeting shall be held at the jobsite, including: Contractor, painting subcontractor, paint manufacturer's technical representative, and Architect. The purpose of the meeting shall be to review job conditions. The paint manufacturer's technical representative shall perform an on-site inspection to confirm compatibility and suitability of specified materials, following which he shall provide written certification that all materials specified are entirely suitable for their proposed applications.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in manufacturer's 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. 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 instructions.
- D. Store all materials used on the job in a single place. Keep storage place neat, dry and clean. All soiled or used rags, waste and trash must be removed from the building every night, and every precaution taken to avoid the danger of fire. All materials shall be protected from freezing.

**1.08 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 exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.
- F. The Owner and all subcontractors shall be kept informed of the use of products that may generate fumes in advance of the use of such products.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
  - 1. Basis of Design: Sherwin Williams Co.
  - 2. Acceptable Manufacturers:
    - a. Glidden Professional.
    - b. Benjamin Moore & Co.
    - c. PPG Architectural Finishes, Inc.
    - d. California Paints.
    - e. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 PAINTS AND COATINGS - GENERAL**

- A. All materials used on the Work shall be as specified in brand and quality. No claims as to unsuitability or unavailability of any materials specified, or unwillingness to use same, or inability to produce first class work with same, will be entertained unless such claims are made in writing and submitted prior to the receipt of proposals.
- B. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
  - 1. Provide paints and coatings 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 coating material in quantity required to complete entire project's work from a single production run.
  - 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

- C. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- D. Volatile Organic Compound (VOC) Content:
  - 1. Provide coatings that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
    - b. Architectural coatings VOC limits of State in which the project is located.
  - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

### 2.03 PAINT SYSTEMS - EXTERIOR

- A. Ferrous Metals, Acrylic, 3 Coats:
  - 1. Unprimed Ferrous Metals Surface Preparation: SSPC-Sp6 Blast Clean.
  - 2. Primer 1st coat; SW Pro-Cryl Universal Acrylic Primer, B66-310. 2-4 mils DFT.
  - 3. Semi-gloss: 2nd and 3rd coats; SW Sher-Cryl HPA Acrylic B66-350. 2.5-4 mils DFT/coat.

### 2.04 PAINT SYSTEMS - INTERIOR

- A. Wood, Opaque, Latex, 3 Coats:
  - 1. Applications: Woodwork.
  - 2. Primer 1st coat: SW Harmony Interior Latex Primer; 1.6 mils DFT.
  - 3. Semi-gloss: 2nd and 3rd coats: SW Harmony low Odor Latex B10-500 Series, 1.6 mils DFT/coat.
  - 4. Eg-shell: 2nd and 3rd coats: SW Harmony low Odor Latex B09-500 Series, 1.6 mils DFT/coat.
- B. Ferrous Metals, Pre-primed, Acrylic, 3 Coats:
  - 1. Applications: Items above 10 feet.
  - 2. Primer 1st coat: Reprime with compatible primer.
  - 3. Semi-gloss: 2nd and 3rd coats; SW ProClassic Water-borne Acrylic B31. 1.4 mils DFT/coat.
- C. Ferrous Metals, Water-based urethane, 3 Coats:
  - 1. Applications: Handrails and railings, hollow metal frames & doors, and stair structures.
  - 2. Primer 1st coat; SW Pro Industrial Pro-Cryl Universal Primer, B66-310, 2 to 4 mils DFT;
  - 3. Semi-gloss: 1st and 2nd coats: SW Waterbased Acrolon 100 and Part B Hardener B65-720, 2 to 4 mils DFT.
- D. Ferrous Metals, Acrylic, 3 Coats:
  - 1. Applications: Exposed conduit, piping, ductwork, cable trays, etc... infrastructure. Note: different colors are required for the various types of surfaces.  
NOTE: Special attention shall be paid to proper surface preparation.
  - 2. Primer 1st coat: Compatible primer.
  - 3. Satin: 2nd and 3rd coats; SW Pro Industrial Zero VOC Satin Acrylic B66-660, 2.5-4 mils DFT.
  - 4. Semi-gloss: 2nd and 3rd coat; SW Pro Industrial Zero VOC Semi-Gloss B66-650, 2.5-4 mils DFT.
- E. Gypsum Board, Latex, 3 Coats:
  - 1. Applications: Eggshell for general walls. Flat for ceilings and soffits.
  - 2. 1st coat primer; SW Harmony Low Odor Interior Latex Primer, 1.6 mils DFT.
  - 3. Eggshell: 2nd and 3rd coats: SW Harmony Low Odor Latex Egg-Shel, 1.6 mils DFT/coat.
  - 4. Flat: 2nd and 3rd coats; SW Harmony Low Odor Latex Flat. 1.6 mils DFT/coat.
- F. Gypsum Board, Acrylic-Epoxy, 3 Coats:
  - 1. Application: For walls designated Special Paint SP-1 on Finish Schedule.
  - 2. 1st coat primer; SW Prep-Rite 200 Latex Primer.



3. Semi-gloss: 2nd and 3rd coats; SW Water Based Catalyzed Epoxy B70. 3-4 mil DFT/coat.
- G. Fabrics/Insulation Jackets, Water-based Enamel, 3 Coats:
  1. 1st coat primer sealer; SW PrepRite 200 Latex Primer B28W200.
  2. Semi-gloss: 2nd and 3rd coats; SW ProClassic Waterborne Enamel B31. 1.4 mil DFT
- H. Concrete Floor Safety Paint, Opaque, Water Based Epoxy, 2 Coat.
  1. For laboratories, shops and other areas indicated. See Drawings for striping layout.
  2. Semi-Gloss: 2 Coats; Tnemec Series 287 Enviro-Pox, Water Based Epoxy-Amine 2-4 mils DFT/coat.
  3. Coordinate with the work of Section 03 35 13 Concrete Floor Finishing.
- I. Cementitious Spray-applied Fireproofing; 2 coats, Dry-fall latex.
  1. Application: Areas of exposed cementitious fire-proofing indicated to be painted.
  2. Cementitious fire-proofing and sealer per Section 07 81 00.
  3. 1st coat; SW Pro Industrial Waterborne Acrylic DryFall Flat, B42-181, 6 mils DFT/coat. Product shall be subject to acceptance by the fireproofing manufacturer.
- J. Fire-Retardant Coating, Intumescent, 2 Coat:
  1. Intumescent Coating per Section 07 81 23.
  2. Semi-gloss: 2nd and 3rd coat; SW Pro Industrial Zero VOC Semi-Gloss B66-650, 2.5-4 mils DFT. Product shall be subject to acceptance by the fireproofing manufacturer.
- K. Concrete / Masonry, Opaque, Water-based Epoxy, 3 Coats.
  1. Application: Special Paint "SP" designation for walls as indicated on Finish Schedule.
  1. Filler/Primer 1st coat; SW Heavy Duty Block Filler B42W46.  
At all light-weight aggregate CMU: Two coats Filler/Primer.
  2. Semi-gloss: 2nd and 3rd coats; SW Water Based Catalyzed Epoxy B70. 3-4 mil DFT/coat.
  3. Gloss: 2nd and 3rd coats; SW Water Based Catalyzed Epoxy B70. 3-4 mil DFT/coat.

## **2.05 ACCESSORY MATERIALS**

- A. Accessory Materials: Other materials not specifically indicated but required to achieve the finishes specified; commercial quality, "best grade" of "first line" made by reputable, recognized manufacturers, shall be compatible with related products and shall bear manufacturer's labels.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

### **3.01 WORKMANSHIP**

- A. Employ skilled mechanics to ensure the very best workmanship. Quality workmanship is required. Materials shall be applied by craftsmen experienced in the use of the specific product involved.
- B. All materials shall be applied in strict accordance with the manufacturer's printed instructions.
- C. Finish work shall be uniform and of the approved color. Paint and stain shall completely cover, be smooth and free from runs, sags, clogging, excessive flooding, or brush marks. Make edges of paint and stain adjoining other materials or colors sharp and clean without overlapping.

### **3.02 EXAMINATION**

- A. Do not begin application of coatings until substrates have been properly 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 are below the following maximums:

1. Gypsum Wallboard: 12 percent.
  2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
- F. Submit test results and action taken to the Architect prior to the application of paint products.
- G. Prime coats specified herein will not be required on items delivered with shop or factory prime coats already applied, providing that shop prime coats are equal in quality to those specified and the painting subcontractor determines their total compatibility with finish coats.

### 3.03 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. General: Do not begin painting on any surface until it is in proper condition to receive the paint or as specified. Should any surface be found unsuitable to produce a proper finish, the Architect and product manufacturer shall be notified in writing and no material shall be applied until the unsuitable surfaces have been made satisfactory.
- 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. New Concrete and Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry. Fill all minor irregularities with approved patching materials and rub to a texture similar to adjacent surfaces. New concrete and masonry shall not be coated for at least 28 days.
1. Testing: Determine alkalinity and moisture content of surfaces by performing appropriate tests. Submit results to the Architect. If the alkalinity of the surfaces could cause the paint to blister and burn, correct this condition before application. Do no paint surfaces where moisture content exceeds that permitted by the paint manufacturer.
- H. New Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound and sand to smooth level surface. Exercise care to avoid raising nap of paper. Spot prime defects after repair.
- I. For Previously Painted Gypsum Board Surfaces: Remove grease, dirt, and other foreign materials as necessary to receive paint. Lightly sandpaper to smooth and even surface and then dust off. Fill all minor irregularities with approved patching materials and sand to smooth level surface. Exercise care to avoid raising nap of paper. Prime paint any patched surfaces.
- J. New Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- K. New Shop-Primed Interior Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
- L. New Shop-Primed Exterior Steel Surfaces to be Finish Painted: Sand-blast to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Touch-up primer where disturbed.
- M. New Wood Items to Receive Opaque Finish: Sandpaper to smooth and even surface, then wipe off dust and grit prior to priming or staining. After priming or stain coat has been applied,

thoroughly fill all nail holes and other surface imperfections with putty tinted with primer Sand between coats. Back prime concealed surfaces, except floor panels, before installation.

- N. Non-compatible Shop Primers: Cover with suitable barrier coat or remove primer and re-prime as required.
  - 1. Testing: Apply a test patch of the new painting system to test for adhesion. Allow to dry one week before testing per ASTM D3359. If new painting system lifts, completely remove the existing finish.

### **3.04 APPLICATION**

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Spray painted wall surfaces shall be back-rolled. Adjacent areas shall be masked from sprayed areas to avoid different colors and paint types to telegraph through coatings.
- C. No interior painting or finishing shall be permitted until the building has been thoroughly dried out. See Environmental Requirements for application air temperature requirements. Relative humidity shall be 75% maximum. Moisture levels for painting shall be within 5 degrees F of the dew point and shall be determined by use of an electronic moisture meter.
- D. The atmosphere shall be relatively free of airborne dust. Each coat of paint shall be applied smoothly, worked out evenly and allowed to dry completely before the subsequent coat is applied. Follow manufacturer's labeled instructions for drying time between coats
- E. Apply products in accordance with manufacturer's instructions.
- F. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- G. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items or provide ample protection of such items. On completion of each area, replace items removed.
- H. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- I. Sand metal surfaces, enamels and varnishes lightly between coats to achieve required finish.
- J. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- K. Upon completion of painting, reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- L. All closets shall be finished the same as adjoining rooms, unless otherwise indicated.
- M. All doors and frames shall have the same finish and number of coats on both interior and exterior sides. Do not paint over door and frame fire-rating labels.
- N. All exposed steel stair components shall be painted, including but not limited to stringers, stair and landing pans, support structure, and railings.
- O. Upon completion, touch up and restore finish where damaged and leave in good condition.
- P. Paint shop-primed equipment.
- Q. Access panels, registers, cabinet heaters, radiators, and electrical panels and similar equipment shall be painted in colors as selected by the Architect.
- R. Exposed piping, conduit, wiremold, ductwork, pipe insulation, and hangers shall be painted in colors selected by the Architect.
- S. Wall surfaces to receive wall panels shall be primed.

### **3.05 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field testing.
- B. The Owner may provide field testing during the period that paint is being applied to sample paint materials being used and verify paint application thickness.

- C. If test results show material being used does not comply with the specified requirements, the Contractor may be directed to stop painting, remove non-complying paint, pay for testing and repaint surfaces coated with the rejected product.

**3.06 CLEANING AND PROTECTION**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

**3.07 PROTECTION**

- A. Protect finished coatings until completion of project.
- B. Provide drop cloths in all areas where painting is being done to protect floors and other work from damage during painting. Mask or otherwise protect smaller objects adjacent to painted surfaces.
- C. Waste materials shall not be disposed of in the existing sanitary system.
- D. When the Work of this Section is completed, remove all surplus materials and scaffolding from the premises and clean off all misplaced paint, varnish, stain and the like so as to leave the premises in perfect condition, free of all paint.

**END OF SECTION**

**SECTION 10 11 01**  
**VISUAL DISPLAY BOARDS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Marker boards.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Blocking and Curbing: Concealed wood blocking.
- B. Section 09 21 16 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

**1.03 REFERENCE STANDARDS**

- A. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.
- B. ANSI A208.1 - American National Standard for Particleboard; 2009.
- C. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. PS 1 - Structural Plywood; 2009.
- F. Porcelain Enamel Institute Specifications.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on marker board, trim, and accessories. Include surface burning test results. Submit sample warranty.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
  - 1. Take field measurements prior to fabrication and installation to ensure proper fitting and coordinate / confirm locations of any mechanical and electrical wall mounted devices.
- D. Samples: Submit color charts for marker board.
- E. Manufacturer's printed installation instructions.
- F. Maintenance Data: Include data on regular cleaning and stain removal.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum ten years documented experience.

**1.06 WARRANTY**

- A. See Section 01 78 01 - Warranties, for additional warranty requirements.
- B. Provide twenty (20) year warranty for marker board to include warranty against discoloration due to cleaning, crazing or cracking, and staining. Warranty shall cover replacement cost of the boards.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Visual Display Boards:
  - 1. Claridge Products and Equipment, Inc.
  - 2. Nelson Adams - Polyvision Corp.
  - 3. Aarco Products Inc.
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 VISUAL DISPLAY BOARDS**

- A. Marker boards: Porcelain enamel on steel, laminated to core.

1. Color: White.
2. Metal Face Sheet Thickness: 0.024 inch (24 gage).
3. Core: Particleboard, 3/8 inch thick, laminated to face sheet.
4. Backing: Aluminum sheet, laminated to core.
5. Size: As indicated on the Drawings. Boards shall be maximum possible lengths to eliminate vertical seams.
6. Frame: Min 0.062 inch thickness Extruded aluminum, with concealed fasteners.
7. Frame Profile: Snap-on trim, manufacturer's standard.
8. Frame Finish: Anodized, natural.
9. Accessories: Marker tray.
10. Provide manufacturer's standard scale lines at boards for music as indicated on the Drawings.

## **2.03 MATERIALS**

- A. Porcelain Enameled Steel Sheet: ASTM A424, Type I, Commercial Steel, with fired-on vitreous finish.
- B. Particleboard: ANSI A208.1; Grade 1-M-1, wood flakes, no urea-formaldehyde added waterproof resin binder, sanded faces.
- C. Aluminum Sheet Backing: 0.015 inch thick.
- D. Adhesives: Low VOC type used by manufacturer.
- E. Exposed Aluminum Finish: Comply with NAAMM Metal Finish Manual for Architectural and Metal Products.

## **2.04 ACCESSORIES**

- A. Marker Tray: Aluminum, manufacturer's standard profile one piece full length of chalk board, molded ends; concealed fasteners, same finish as frame.
- B. Mounting Brackets: Concealed.

## **2.05 FABRICATION**

- A. Face and backer sheets of marker boards shall be laminated to the core material under heat and pressure with manufacturer's standard flexible waterproof adhesive.
- B. Coordinate factory assembled units with trim and accessories. Join parts with a neat, precise fit. Make joints only where total length exceeds maximum manufactured length. Fabricate with a minimum number of joints, balanced around the center of the board. Provide manufacturer's standard vertical joint spline system between abutting sections of boards within a unified perimeter frame. Provide manufacturer's standard mullion trim at joints between boards in combination units.

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

## **3.02 INSTALLATION**

- A. Install boards in accordance with manufacturer's instructions.
- B. Marker boards installed on exterior wall surfaces shall be furred off the gypsum board to allow for ventilation.
- C. See Drawings for mounting height of boards. Any questions or conflicts shall be brought to the attention of the Architect.
- D. Secure units level and plumb.

- E. Carefully cut holes in boards for wall mounted devices.

**3.03 CLEANING**

- A. Clean board surfaces in accordance with manufacturer's instructions.

**END OF SECTION**

**SECTION 10 14 24**  
**INTERIOR SIGNAGE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. ADA compliant interior signage
- B. Vinyl wall graphics.

**1.02 REFERENCES**

- A. ANSI/ICC A117.1 - Accessible and Useable Buildings and Facilities; 2009.
- B. ADAAG - Americans with Disabilities Act, Accessibility Guidelines for Buildings and Facilities 2010.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature.
- C. Shop Drawings: Submit shop drawings showing to scale all sign types including lettering, layout and dimensions.
  - 1. Submit a sign schedule with all signs listed by door number location. Sign schedule shall include sign type, sign text and side of wall for mounting by room number.
- D. Selection Samples: One complete set of color chips representing manufacturer's full range of available colors.
- E. Verification Samples: Two full size samples, representing type, style and color specified including method of attachment.

**1.04 QUALITY ASSURANCE**

- A. Regulatory Requirements: Comply with requirements of ANSI/ICC A117.1 and ADAAG.

**1.05 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Inspect products upon receipt. Store products in manufacturer's packaging until ready for installation.

**1.07 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Best Sign Systems.
- B. Acceptable Manufacturers:
  - 1. Mohawk Sign Systems.
  - 2. Welch Architectural Signs.
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 INTERIOR ADA-COMPLIANT SIGNS**

- A. ADA-Compliant Interior Signage, Borderless:
  - 1. Style: HC200 ADA System by Best Sign Systems.
  - 2. Type: Three-in-one construction without borders; photopolymer signs with lettering and symbols raised 1/32 inch from sign plate face.



3. Sign Thickness: 1/8 inch thick or 1/4 inch thick as required.
  4. Construction: One-piece; added-on or engraved characters not acceptable.
  5. Lettering Style: Helvetica Medium, upper case.
  6. Braille: Grade 2 Braille, placed directly below last line of letters or numbers.
  7. Performance: Non-static, fire-retardant, and self-extinguishing.
  8. Contrast: Letters numbers and symbols shall contrast with background.
  9. Corners: Square.
  10. Color of Plastic: As selected from manufacturer's standard colors.
  11. Finish of Plastic: Matte.
  12. Color of Background: As selected from manufacturer's standard paint colors.
  13. Letter and Number Sizes:
    - a. Room numbers and text, 7/8 inch high.
    - b. Lettering for exit signs, 2 inches high.
  14. Sign Margins: Letters and numbers, 1/2 inch left margin and 3/8 inch top margin.
  15. Sign Sizes:
    - a. Room Number, Restroom, Exit signs, 8 by 8 inches.
    - b. Other Signs: As required, as approved by Architect.
- B. Sign Types: Numbers and text may change at a later date, but the Contractor's bid shall be based on the following:
1. Room Number Signs: One sign with room number and name for every door scheduled on the Door Schedule. All corridor door signs shall include the room name and the room number. Text at stairwell entrance doors shall be "Stair 1" for example, on each side of door.
  2. Toilet Room Signs: All toilet rooms shall be identified by name and number.
  3. Exit Signs: One sign with "EXIT" text at every door with a lighted exit sign. See the Electrical Drawings for locations of lighted exit signs.
  4. Provide an additional twenty (20) signs with text and number to be determined.
  5. Room Occupancy Capacity Signs: Provide 1 for all assembly spaces, including, but not limited to: café and café/village. Text: "Capacity XXX Persons". Located sign near the main entrance within the space, as directed by the Architect.
  6. All signs where door is adjacent to glass surfaces shall include a blank sign to mount on the opposite glass side of the sign.

## **2.03 INTERIOR VINYL WALL GRAPHICS**

- A. Vinyl Wall Graphics: U.V. resistant custom wall graphics composed of letters and custom logo graphics. Custom graphic images shall be furnished by Owner in electronic format for sign preparation. Six (6) wall graphics to be provided in locations designated by the Architect in the field.
1. Wall Areas to be Covered: 8 feet x 6 feet.
  2. Wall Surface Finish at Graphics: Painted gypsum board.
  3. Colors: Multiple colors as selected from full standard range.
  4. Products: Duratex Blockout Permanent Adhesive Vinyl with UV Laminate.
  5. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine installation areas to ensure that conditions are suitable for installation.
- B. Examine signage for defects prior to installation. Do not install damaged signage.

### **3.02 PREPARATION**

- A. Verify mounting heights and locations for interior signage will comply with referenced standards.

- B. Clean mounting locations of dirt, dust, grease or similar conditions that would prevent proper installation.

### **3.03 INSTALLATION**

- A. Install signs level, plumb, without distortion, and in proper relationship with adjacent surfaces using manufacturer's recommended standard mounting system.
  - 1. Mounting: Mount with tamper-resistant screws, minimum 4 per sign. All signs over ten (10") inches in length shall be furnished with additional intermediate screws (top and bottom). Signs mounted to glass shall be adhered using industrial strength tape.
- B. Mounting Height and Locations:
  - 1. Mounting locations shall be as determined by the Architect.
  - 2. In general, signs shall be mounted at 60" above the finish floor to the baseline of the highest character. This is a maximum limit and shall not be exceeded.
    - a. For locations where this cannot be done, the Architect shall review and provide location.
  - 3. For door signs, mounting shall be 5" from the door latch jamb; leaving 1" between the edge of frame and edge of sign. Signs shall not be located so as to be obscured by doors in the open position.
  - 4. Signs shall be located so that a person can approach a sign within three (3") inches without encountering obstacles or standing within the swing of the door.
- C. Clean signs and remove adhesive from exposed sign surfaces after installation as recommended by manufacturer.
- D. Replace damaged products before Substantial Completion.

**END OF SECTION**

**SECTION 10 14 25**  
**EXTERIOR SIGNAGE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Building mounted exterior signage.

**1.02 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature.
- C. Shop Drawings: Submit shop drawings showing to scale all sign types including fastening methods, lettering, layout and dimensions.
- D. Samples:
  - 1. Submit manufacturer's full range of colors for selection. A minimum of 40 colors shall be available for selection.
  - 2. Submit sign letter sample in color, size and font selected.

**1.03 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.

**PART 2 PRODUCTS**

**2.01 EXTERIOR BUILDING MOUNTED SIGNAGE**

- A. Cast Letters: Cast aluminum letters with baked enamel finish; 24" inch high capital letters and approximately 1 inch deep. Font style and color to be selected from manufacturer's full range. Concealed fasteners for rear mount bottom angle bracket mount system with individual character tie-backs. Secure, blindside, "hyphen" to adjacent characters.
  - 1. Signs Required: Exact text may change, but the following shall be assumed for bidding purposes:
    - a. (1) sign: MID-COAST SCHOOL OF TECHNOLOGY
- B. Manufacturers:
  - 1. Welch Signage
  - 2. Gemini Sign Company
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Examine installation areas to ensure that conditions are suitable for installation.
- B. Examine signage for defects prior to installation. Do not install damaged signage.
- C. Verify compatibility of sealants used with Section 07 53 00.

**3.02 PREPARATION**

- A. Verify mounting heights and locations for exterior signage with Architect.

**3.03 INSTALLATION**

- A. Install signs level, plumb, without distortion, and in proper relationship with adjacent surfaces using manufacturer's recommended concealed mounting system.
- B. Clean signs after installation if required as recommended by manufacturer.
- C. Replace damaged products before Substantial Completion.

**END OF SECTION**

**SECTION 10 21 13**  
**LAMINATE-CLAD PHENOLIC TOILET COMPARTMENTS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Laminate clad phenolic core toilet compartments.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Blocking and Curbing: Concealed wood blocking for compartment support.
- B. Section 10 28 00 - Toilet Accessories.

**1.02 REFERENCE STANDARDS**

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- C. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
- D. ANSI/ICC A117.1 - Accessible and Usable Buildings and Facilities, 2010.
- E. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Samples:
  - 1. Submit manufacturer's full range of color samples for selection.
  - 2. Submit samples of partition panels, 3x3 inch in size illustrating selected panel finish, color, and sheen.

**1.05 WARRANTY**

- A. See Section 01 78 10 - Warranties.
- B. Provide manufacturer's standard product warranty against delamination, corrosion or breakage for ten (10) years following date of Substantial Completion.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Laminate - Phenolic Core Compartments:
  - 1. Euroline Solid Phenolic Core Compartments by Ampco.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 MATERIALS**

- A. High Pressure Plastic Laminate: NEMA LD 3; 0.065 inch thickness.
- B. Solid phenolic core.
- C. Materials shall meet minimum interior finish classification off Class C as tested in accordance with NPFA 286, Standard Method of Test of Surface Burning Characteristics of Building Materials.

**2.03 COMPONENTS**

- A. Toilet Compartments: Laminate faced with phenolic core, floor mounted, overhead braced.
- B. Doors, Panels, and Pilasters: Solid phenolic core with high pressure laminate surface sheets fused at high temperature and pressure, with beveled corners, edges and cut-outs.
  - 1. Finish Colors: As selected by the Architect from the manufacturer's full color range.
- C. Door and Panel Dimensions:
  - 1. Door and Pilaster Panel Thickness: 3/4 inch.
  - 2. Compartment Panel Thickness: 1/2 inch.
  - 3. Door Width: 24 inch.
  - 4. Door Width for Accessible Use: 33 inches clear.
  - 5. Height: 72 inches.

**2.04 ACCESSORIES**

- A. Pilaster Shoes: Euro-style; formed ASTM A 666, Type 304 stainless steel with No. 4 finish, 3 inches high, concealing floor fastenings.
  - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
  - 2. Provide ceiling attachment using two adjustable hanging studs, attached to above-ceiling framing.
- B. Head Rails: Hollow anodized aluminum tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall brackets.
- C. Wall and Pilaster Brackets: Polished stainless steel.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
- E. Steel Plate Reinforcement: Carbon steel, prepared for fasteners, 1/8 inch thick.
- F. Hardware: Polished stainless steel:
  - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
  - 2. Thumb turn door latch with exterior emergency access feature.
  - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
  - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
  - 5. Provide door pull on both sides of doors for out-swinging doors.

**PART 3 EXECUTION****3.01 INSTALLATION**

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. For floor anchored and overhead braced systems, attach pilasters to floor with a minimum 2" penetration into floor. Level, plumb, and tighten the installation. Adjust pilaster shoes to fit flush with finish floor. Adjust doors parallel with overhead brace.
- C. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- D. Maintain 3/16 inch space between door and pilasters.
- E. Attach panel brackets securely to walls using anchor devices.
- F. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- G. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

**3.02 TOLERANCES**

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

**3.03 ADJUSTING**

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

**END OF SECTION**

**SECTION 10 21 23  
CUBICLES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Surface mounted overhead metal curtain track, guides and curtains.
- B. Industrial curtain walls: overhead suspension system, track, guides, curtain and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Concrete: Coordination of cast-in-place curtain anchors.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; National Fire Protection Association; 2010.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for curtain fabric characteristics and track system.
- C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes. Indicate floor plans showing layout of cast-in-place curtain anchors.
- D. Samples:
  - 1. Submit manufacturer's standard fabric swatches of full fabric line.
  - 2. Submit 12 x 12 inch sample patch of curtain cloth with representative hem stitch detail, heading with reinforcement, and carrier attachment to curtain header.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept curtain materials on site and inspect for damage.
- B. Store curtain materials on site and deliver to Owner for installation when requested.

**PART 2 PRODUCTS****2.01 INDUSTRIAL CURTAIN WALLS, TRACKS AND TRACK COMPONENTS**

- A. Manufacturers:
  - 1. Basis of Design: Industrial Curtain Walls by AmCraft Manufacturing Inc.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Track: Galvanized G-60 or better, 16 Gauge commercial grade low carbon steel; straight and curved sections of lengths to minimize joints; channel profile.
  - 1. Structural Performance: Capable of supporting vertical track test load of 15,000 psi, with an ultimate tensile strength of 3:1, without visible deflection of track or damage to supports, safely supporting moving loads, and sufficiently rigid to resist visible deflection and without permanent set.
  - 2. Suspension/Attachment System: 3/8-16 threaded rod suspension system; 5'-0" O.C. maximum spacing. Where manufacturer's engineering requires additional suspension support most stringent to apply. Beam Edge clamps and threaded rod track connectors as required for a complete installation.
  - 3. Track End Stop: To fit track section – flange up.

4. Track Bends: Factory bends, configurations as indicated on the Drawings; minimum 24 inch radius; fabricated without deformation of track section or impeding movement of carriers.
5. Finish: Commercial clear zinc plated.
- C. Curtain Trolleys/Carriers: Steel ball bearing roller with 1 inch hook design to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.
- D. All Curtain Materials:
  1. ASTM E84: Flame Spread Index of 25, max; Smoke Developed Index of 450, max.
  2. Naturally flame resistant or flame-proofed; capable of passing NFPA 701 test.
  3. Curtains: PVC coated vinyl curtain – fire retardant composed of an opaque lower panel, vision panel and opaque upper panel. Anti-mildew; UV treated.
    - a. Height: 144 inches.
      - 1) Upper Panel: 64 inches.
      - 2) Vision Panel: 52 inches.
      - 3) Lower Panel: 28 inches.
    - b. Length: One piece, in configurations as indicated on the Drawings.
  5. Colors: As selected from manufacturer's full color range. Architect may select up to (2) two different colors for contrasting upper and lower panel colors.
    - a. Finish: Smooth matte.
- E. Curtain Fabrication:
  1. Manufacture curtains sized 10 percent wider than track length. Terminate curtain 6 inches above finish floor.
  2. Top of fabric curtain shall be 150 inches above finish floor.
  3. Opaque Curtain Panels:
    - a. Weight: 18.5 oz/yd.
    - b. Grab Tensile: 375 x 375 lbs / 1".
    - c. Tongue Tear: 100 x 100 lbs / 1".
  4. Clear Vision Panels:
    - a. Gauge: 20 mil.
    - b. Tensile Strength: ASTM D882 260-300 PSI.
    - c. Elongation: ASTM D882 260-300%
- F. Accessories:
  1. Curtain Tie-Down Anchor: Manufacturer standard cast-in-place D-ring anchor. Zinc plated steel capable of a work load limit of 500 lbs or greater.
  2. Fasteners, Connectors and Miscellaneous Accessories: Manufacturer standard as required for a complete system installation for configurations indicated on the Drawings.

## **2.02 CURTAINS, TRACKS AND TRACK COMPONENTS**

- A. Manufacturers:
  1. Cubicle Tracks:
    - a. C/S General Cubicle.
    - b. Imperial Fastener Co., Inc.
    - c. Inpro Corp.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Track: Extruded aluminum straight and curved sections of lengths to minimize joints; I-beam profile.
  1. Structural Performance: Capable of supporting vertical test load of 50 lbs without visible deflection of track or damage to supports, safely supporting moving loads, and sufficiently rigid to resist visible deflection and without permanent set.
  2. Track End Stop: To fit track section.



3. Track Bends: Factory bends, configurations as indicated on the Drawings; minimum 12 inch radius; fabricated without deformation of track section or impeding movement of carriers.
4. Finish on Exposed Surfaces: White enamel finish.
5. Track Size: 3/4" H x 1-3/8" W.
6. Products:
  - a. Optitrac Track System by InPro Corp.
  - b. Track with 1026 N Carrier by General Carrier.
  - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Curtain Carriers: Nylon roller to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal; 2.2 carriers per foot of track length. Ball and chain with metal hooks.
- D. All Curtain Materials:
  1. ASTM E84: Flame Spread Index of 25, max; Smoke Developed Index of 450, max.
  2. Naturally flame resistant or flame-proofed; capable of passing NFPA 701 test.
  3. Curtains: Close weave polyester; anti-bacterial, self deodorizing, sanitized, preshrunk.
  4. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, same color as curtain.
  5. Colors: As selected from manufacturer's full color range.
- E. Curtain Fabrication:
  1. Manufacture curtains of one piece, sized 10 percent wider than track length. Terminate curtain 15 inches from floor.
  2. Include open mesh cloth at top of curtain for room air circulation. Top of fabric curtain shall be 84" AFF.
  3. Curtain Heading: Triple thickness 2 inches wide, with stitched button holes for carriers 6 inches on center, double fold bottom hem 2 inches wide with lead weights included. Lock stitch seams in two rows. Turn seam edges and lock stitch.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.
- B. Verify that field measurements are as indicated.

#### **3.02 INSTALLATION**

- A. Install curtain track to be secure, rigid, and true to ceiling line. Install end caps and stop device.
- B. Install curtains on carriers ensuring smooth operation.

#### **3.03 CLEANING**

- A. Clean soiled exposed surfaces of curtain assemblies and suspension system members as recommended by the manufacturer. Remove and replace damaged components that cannot be successfully cleaned and repaired.

**END OF SECTION**

**SECTION 10 26 01  
WALL AND CORNER PROTECTION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Corner guards.
- B. Wall protection panels.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 21 16 - Gypsum Board Assemblies: Metal stud wall construction.
- B. Section 09 90 00 – Painting: Priming of wall surfaces for wall protection panels.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- B. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2014.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.
- C. Shop Drawings: Submit seaming diagrams for all wall protection panels.

**PART 2 PRODUCTS****2.01 COMPONENTS**

- A. Corner Guards Type CG-1: See Section 09 21 16 Gypsum Board Assemblies.
- B. Wall Protection Panels Type WPP-1: 0.10" thickness, homogenous, 100% pure vinyl, extruded, semi-rigid PVCu sheet. Manufacturer's accessories.
  - 1. Fire Resistance: UL-723 Class A; Flame Spread of 20 or less; Smoke Developed of 400 or less.
  - 2. Top Edge: Beveled edge without trim
  - 3. Seams: Heat welded.
  - 4. Panel Height: Full height of wall.
  - 5. Panel Size: Maximum sheet size to minimize seams.
  - 6. Color/Texture: As selected by the Architect from manufacturer's full range.
  - 8. Adhesive: Water-based, low odor, as recommended by the panel manufacturer.
  - 9. Products:
    - a. Altro Whiterock PVCu by Altro.
  - 10. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Wall Protection Panels Type WPP-2: 0.090" thickness, Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319. Manufacturer's accessories.
  - 1. Fire Resistance: UL-723 Class A; Flame Spread of 20 or less; Smoke Developed of 400 or less.
  - 2. Top/End Edges: Satin Anodized aluminum trim; Edge A570 Marlite.
  - 3. Seams: Matching sealant for butt joints.
  - 4. Panel Height: As indicated on the Drawings.
  - 5. Panel Size: Maximum sheet size to minimize seams.
  - 6. Color/Texture: As selected by the Architect from manufacturer's full range.
  - 8. Adhesive: Water-based, low odor, as recommended by the panel manufacturer.

9. Products:
  - a. Artizan FRP by Marlite.
10. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Wall Protection Panels Type WPP-3: Same as WPP-1
- E. Item 52 - Bumper Rail: Factory fabricated, extruded EPDM Rubber.
  1. Color: Black.
  2. Size: 1 1/2 inch x 8 inch.
  3. Length(s): See Drawings.
  4. Product(s): Series E-1 Extruded Bumper by Pawlings Corporation
  5. Substitutions: See Section 01 60 00 - Product Requirements
- F. Fasteners, sealants, adhesives and other components as recommended by manufacturer for installation.

## **2.02 FABRICATION**

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

## **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.

### **3.02 INSTALLATION**

- A. Install components in accordance with manufacturer's instructions, level and plumb, at proper height.
- B. Wall Protection Panels:
  1. Verify wall surfaces are primed. See Section 09 90 00.
  2. Clean substrate surfaces to remove dust, debris and loose particles.
  3. Adhere panels to substrate with troweled on adhesive as recommended by the panel manufacturer. Smooth roll the surface.
  4. Apply panel moldings per manufacturer guidelines.
  5. Clean-up surfaces in accordance with manufacturers maintenance instructions.

### **3.03 TOLERANCES**

- A. Maximum Variation From Required Height: 1/8 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch; 1/8 inch for lengths 10 feet and less.

**END OF SECTION**

**SECTION 10 28 00  
TOILET ACCESSORIES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Accessories for toilet rooms, shower rooms, utility rooms and for sinks and other fixtures at locations indicated on the Drawings.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Blocking and Curbing: Concealed wood blocking.
- B. Section 09 21 16 - Gypsum Board Assemblies: Metal stud partitions for special loading including but not limited to that imposed by grab bars and shower seats.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- D. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.
- E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods. Provide verification by an independent testing organization of grab bar strength and installation.
- C. Samples: Submit one sample of each accessory, illustrating color and finish, if requested by Architect.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.
- E. Close-out Requirements: Submit maintenance data, operating instructions and keys required for each type of equipment and lock.

**1.06 PRODUCT HANDLING**

- A. Deliver items in manufacturer's original unopened protective packaging. Store materials as required to prevent soiling, damage, or wetting. Maintain protective covers on all units. Remove protective covers at final clean-up of installation.

**1.07 WARRANTY**

- A. See Section 01 78 10 – Warranties, for term and other warranty requirements.
- B. Provide manufacturer's standard product warranty for mirrors against silver spoilage for ten (10) years.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: Bobrick Washroom Equipment, Inc.
- B. Other Acceptable Manufacturers:
  - 1. Bradley Corp.
  - 2. McKinney Parker.
  - 3. Substitutions: Section 01 60 00 - Product Requirements.
- C. All items of each type to be made by the same manufacturer.

**2.02 MATERIALS**

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 3 keys for each accessory to Owner; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A 666, Type 304, 0.034 inch (22 gage) minimum thickness, unless otherwise indicated.
- D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653, with G90/Z275 coating.
- E. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- F. Adhesive: Two component epoxy type, waterproof.
- G. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof and of same materials as accessory where exposed.

**2.03 FINISHES**

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.
- C. Baked Enamel: Pre-treat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

**2.04 TOILET ROOM ACCESSORIES**

- A. NOTE: Accessory item numbers correspond to accessory symbol numbers on the Drawings.
- B. Item 1H - Jumbo Toilet Paper Dispenser: Surface mounted.
  - 1. Product: Furnished by Owner, installed by Contractor.
- C. Item 5B - Feminine Napkin Dispenser: Stainless steel, surface mounted.
  - 1. Product: Furnished by Owner, installed by Contractor.
- D. Item 6A - Feminine Napkin Receptacle: Stainless steel, all-welded construction, recessed mounted.
  - 1. Product: B-353 by Bobrick.
- E. Item 7A - Mirror: Stainless steel welded framed, 6 mm thick tempered glass mirror; non-absorptive backing filler and galvanized sheet steel backer plate; surface mounted. Size as indicated on the Drawings.
  - 1. Products: B-290 Series by Bobrick.
- F. Item 10B - Soap Dispenser: Foaming soap dispenser, top-filling deck-mounted on lavatory with vandal resistant locking cover and spout, with polyethylene container concealed below deck; piston and 4 inch spout of stainless steel with bright polished finish; chrome-plated deck escutcheon and mounting spacers.
  - 1. Minimum Capacity: 34 ounces.

2. Product: B-823 Soap Dispenser by Bobrick
- G. Item 11A - Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
  1. Products: B-76717 by Bobrick.
- H. Item 13B, 13E - Grab Bars: Stainless steel, nonslip grasping surface finish; standard duty; minimum rated point load of 250 pound-force.
  1. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
  2. Lengths and Configurations: As indicated on the Drawings.
  3. Product: B-5806 Series by Bobrick. (1-1/4")
- I. Item 14A - Shelf, Mop and Broom Holder: Surface mounted; 34" long, 3 spring loaded rubber cam holders, 4 hooks, one shelf.
  1. Products: B-239 by Bobrick.
- J. Item 15A - Hand Dryer: Traditional fan-in-case type, with downward nozzle. Automatic infrared optical sensor-operated on and off with 15 second run time. Surface mounted. tamper-resistant screw attachment of cover to mounting plate. Noise reduction 9dB feature. 120V, 1 phase, as required; 500 watt. Five-year warranty. Case color to be white epoxy, graphite textured, or brushed stainless steel as selected by Architect. Nominal 6.75" D x 11.75" W x 12.75" H.
  1. Xlerator Eco by Excel Dryer Inc.
- K. Item 21A - Shower Curtain Rod, Rings and Curtain:
  1. Product: Furnished by Plumber per Division 22 as a component of each shower enclosure assembly, installed by Contractor.
- L. Item 22A - Diaper Changing Station: Diaper Changing Station: Recessed mounted; ASTM F2255; folding horizontal style; supports concentrated force of 200 pounds applied at any point in any direction. Horizontal style; stainless steel shell with polyethylene body. Minimum rated load 200 lbs.
  1. Product: KB110-SSRE by Koala Kare-Bobrick.
- M. Item 90B - Coat Hooks: Aluminum double wardrobe hook. 1-1/16" high x 1-1/4" wide, 1-3/32" projection.
  1. Product: #582 by Ives.
- N. Item 95 – Closet Rod: Heavy duty commercial grade steel core with finished wrap. Finish: Chrome.
  1. Wall Thickness; 0.106 inches.
  2. Outside Diameter:
    - a. Typical: 1 1/16 inches.
    - b. Welding 160: 1 5/16 inches.
  3. Lengths and Configurations: As indicated on the Drawings.
  4. Wall-Mount Flanges: Series 734/764 by Knape & Vogt.
  5. Provide manufacturer center supports limiting spans to no greater than 32 inches, maximum.
  6. Product:
    - a. Typical unless otherwise specified: 770-1 Series Extra-Duty Round Closet Rod by Knape & Vogt.
    - b. Welding 160: 770-5 Series Extra-Duty Round Closet Rod by Knape & Vogt.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify existing conditions before starting work. Check opening scheduled to receive recessed units for correct dimensions, plumbness of blocking or frames, and preparation that would affect installation of accessories.

- B. Verify exact location of accessories for installation. Check for conditions that would affect placement, quality and execution of work.
- C. Verify that field measurements are as indicated on drawings. Verify spacing of plumbing fixtures and toilet partitions that affect installation of accessories.
- D. See Section 06 10 54 - Wood Blocking and Curbing, for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings. Do not begin installation of accessories until openings and surfaces are acceptable and adequate blocking has been provided

### **3.02 PREPARATION**

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

### **3.03 INSTALLATION**

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings.
- D. Secure all items to concealed blocking or anchor plates installed in walls. All anchors shall be fully concealed.
  - 1. Stationary grab bar mounting devices and supports within walls shall support a concentrated force of 250 pounds applied at any point in any direction 4" from the face of the wall.
  - 2. Diaper changing cabinet mounting devices and supports within walls shall support a concentrated force of 200 pounds applied at any point in any direction 11" from the face of the wall.
- E. All accessories installed in wet shower areas shall have fastener penetrations sealed with silicone sealant.
- F. Adjust accessories for proper operation. After completion of installation, clean and polish all exposed surfaces. Deliver keys and instruction sheet to Owner. All keys shall be clearly labeled.
- G. Paper towel and soap dispensers shall be installed at all sinks outside of restrooms, whether indicated or not on the Drawings.

### **3.04 PROTECTION**

- A. Protect installed accessories from damage due to subsequent construction operations.

**END OF SECTION**

**SECTION 10 44 00**  
**FIRE PROTECTION SPECIALTIES**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fire extinguishers, fire extinguisher cabinets and accessories.
- B. Fire blanket in wall mounted metal case.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 21 16 - Gypsum Board Assemblies: Roughed-in metal stud wall openings.

**1.03 REFERENCE STANDARDS**

- A. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.
- B. UL - Fire Protection Equipment Directory; current edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions and rough-in measurements for recessed cabinets. Verify that cabinets are sized to accommodate the type and capacity of extinguishers specified.
- C. Product Data: Submit fire extinguisher cabinet and extinguisher operational features, color and finish, and anchorage details.

**1.05 WARRANTY**

- A. See Section 01 78 10 - Warranties, for term and other warranty requirements.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: J L Industries.
- B. Acceptable Manufacturers:
  - 1. Larsen's Manufacturing.
  - 2. American Specialties Inc.
  - 3. Ansul, Inc.
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 FIRE EXTINGUISHERS**

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent. Provide extinguishers labeled by UL for the purpose specified and indicated.
- B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage; baked polyester powder coat
  - 1. Class: A:B:C.
  - 2. Size: 10 pound.
  - 3. Locations: General use as noted on Drawings.
- C. Wet Chemical Type: Stainless steel tank, with pressure gage.
  - 1. Class 2A:1B:1C:K.
  - 2. Size: 2.5 gallon.
  - 3. Location: Kitchen, Culinary, and Baking.



**2.02 FIRE EXTINGUISHER CABINETS**

- A. Cabinets: Formed primed steel sheet; 0.036 inch thick base metal, welded, fill and ground smooth with factory baked enamel finish. Color as selected by Architect from manufacturer's full range. Cabinet configurations recessed and semi-recessed type as indicated. Provide trim for 4" projection of semi-recessed cabinet. Size cabinets to accommodate accessories.
  - a. Door: Hollow core, reinforced for flatness and rigidity; latching with nylon catch. Hinge doors for 180 degree opening with continuous piano hinge. Full door glazing, 1/4 inch thick acrylic.
  - b. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
  - c. Provide ADAC option for cabinets located in fire-rated wall construction.
  - d. Product: Ambassador Series 1017 by JL Industries.

**2.03 FIRE BLANKETS AND CABINETS**

- A. Fire Blanket & Cabinet: Surface mounted emergency cabinet with fire blanket attached to a vertical roller to enable personal wrapping in one continuous motion. Metal cabinet with solid metal door; red factory epoxy painted finish, zinc-plated pull handles, roller catches and vertical white lettering. styles.
  - a. Size 6.5" W x 68" H x 4.5" D.
  - b. Product: Royal Series Model 9519S21 Vertical Roller Cabinet with Fire Blanket by JL Industries.
  - c. Science Lab, and locations shown on Drawings.

**2.04 ACCESSORIES**

- A. Extinguisher Brackets: Formed steel, chrome-plated. Provide wall brackets for all extinguishers not indicated to be in a cabinet. Brackets shall be as recommended by the fire extinguisher manufacturer for weight and size of the extinguisher to be hung. Finish shall match the extinguishers. Provide spring-type metal straps to secure the extinguisher on hook.
- B. Cabinet Signage: Plastic, 3-D tent type; 5 inches x 6 inches.
  - 1. Basis of Design: 24S by JL Industries Inc.

**PART 3 EXECUTION****3.01 INSTALLATION**

- A. Verify as-built conditions before starting work. Verify rough openings for cabinet are correctly sized and located.
- B. See Code Analysis Key Plan Drawings for fire extinguisher locations. Refer to the Drawings for locations of fire blanket cabinets, fire extinguisher cabinets and fire extinguishers (designated F.E.C.), wall mounted fire extinguishers without cabinets (designated F.E.). Locations shown on the Drawings are approximate. Verify all locations and mounting heights with the Architect prior to roughing-in of cabinets or mounting brackets. In general, fire extinguishers shall be installed no higher than 4'-0" AFF to top of unit.
- C. Install in accordance with manufacturer's instructions. Install cabinets plumb and level in wall openings, no higher than 4'-0" inches from finished floor to top of cabinet. Secure rigidly in place.
- D. Place extinguishers in cabinets and on wall brackets as indicated. All fire extinguishers shall be fully charged and inspected within one (1) month prior to date of Substantial Completion.
- E. Position cabinet signage at each extinguisher location. Verify placement in field with architect.

**3.02 SCHEDULE**

- A. In addition to locations indicated on the Drawings for fire extinguishers in cabinets and mounted on walls, fire extinguishers shall be provided in the following locations:
  - 1. One wall mounted fire extinguisher in all elevator machine room.
  - 2. One wall mounted fire extinguisher in boiler room.

**END OF SECTION**

**SECTION 10 51 00  
LOCKERS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Metal lockers with hinged doors.
- B. Phenolic lockers with hinged doors.
- C. Accessible lockers with hinged doors.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 54 - Wood Blocking and Curbing: Wood base construction.
- B. Section 06 20 00 – Finish Carpentry: Custom millwork surrounding lockers.
- C. Section 12 36 00 – Countertops.

**1.03 REFERENCE STANDARDS**

- A. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on locker construction, sizes, locks and accessories.
- C. Shop Drawings: Submit locker plan layouts including locations of accessible lockers, locker elevations, sections and all relevant details including numbering plan. Indicate gages, panel thicknesses and finishes of all materials.
  - 1. NOTE: Construction of adjacent masonry or stud partitions shall be coordinated with locker shop drawings to ensure a proper fit. Prior to fabrication, verify field conditions and measurements, before fabrication and indicate measurements on shop drawings.
- D. Samples:
  - 1. Full Size Sample: Upon request, submit a full-size locker of each construction specified for evaluation of construction.
  - 2. Finish Samples: Submit samples, minimum 2x2 inches in size, of manufacturer's full color line for selection of metal paint colors and laminate colors.
- E. Manufacturer's Installation Instructions: Indicate component installation assembly.
- F. Submit sample warranty.

**1.05 QUALITY ASSURANCE**

- A. All lockers shall be installed by the locker manufacturer's authorized representative. Lockers and accessories for each type of locker (metal and phenolic) shall be obtained through one source from a single manufacturer for each type.

**1.06 WARRANTY**

- A. See Section 01 78 01 - Warranties, for additional warranty requirements.
- B. Provide the welded metal locker manufacturer's standard lifetime product warranty against all defects in materials and workmanship, structural failure, and faulty operation of latches and other door hardware for the full life of the building. Damage from deliberate destruction and vandalism is excluded.
- C. Provide phenolic lockers with manufacturer's standard twenty (20) year warranty.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect locker finish and adjacent surfaces from damage.
- B. Lockers shall not be delivered to the Project until spaces to receive them are clean, dry and ready for the locker installation.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Phenolic Lockers:
  - 1. Summit Lockers Inc.; Product: Summit Phenolic.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Metal Lockers:
  - 1. Lyon Workspace Products.
  - 2. DeBourgh Manufacturing Co.
  - 3. Penco Products, Inc.
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 LOCKER APPLICATIONS**

- A. Welding Lockers 160A:
  - 1. Type: Metal vented, double tier.
  - 2. Unit Size: 16"W x 16" D x 72" H.
  - 3. Base: 4 inches.
  - 4. Fittings: Hat shelf, 2 coat hooks.
  - 5. Accessible Unit Quantity: 1.
  - 6. Locks: Built-in combination locks.
  - 7. Total Quantity: See Drawings.
- B. All other lockers indicated unless otherwise specified:
  - 1. Type: Phenolic, single and double tier.
  - 2. Unit Size:
    - a. Single Tier: 24" W x 18" D x 30" H
    - b. Double Tier: 24" W x 18" D x 80" H
  - 3. Base: 4 inches.
  - 4. Fittings: Hat shelf, 2 coat hooks.
  - 5. Accessible Unit Quantity: 5% of total min.
  - 6. Locks: Built-in combination locks.
  - 7. Total Quantity: See Drawings.

**2.03 METAL LOCKERS**

- A. Lockers: Factory assembled, ASTM A653 SS Grade 33/230 formed sheet steel, with G60/Z180 coating, stretcher leveled; metal edges finished smooth without burrs; baked enamel finished inside and out.
  - 1. Color: To be selected by Architect
  - 2. Construction: Lockers shall be welded at seams and joints and all exposed welds sanded smooth. NO BOLTS, SCREWS, OR RIVETS shall be used in assembly of locker bodies.
- B. Locker Body: Formed and flanged; with steel stiffener ribs; welded to form a one piece uniform structure.
  - 1. Body and Shelves: 16 gauge and flanged for stiffness.
- C. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
  - 1. Door Frame, Side uprights: 16 gauge, 0.060 inch, minimum.
- D. Doors: One piece 14 gauge welded construction, 16 gauge channel reinforced inside the door, grind and finish edges smooth.

1. Form recess for operating handle and locking device.
  2. Linear vent, (3) three top and bottom for full length of locker.
- E. Latching: One-piece, pre-lubricated spring steel latch, completely contained within the lock bar under tension to provide rattle-free operation. Lock bar shall be pre-coated, double-channel steel construction; securely contained in the door channel by self-lubricating polyethylene guides that isolate the lock bar from metal-to-metal contact with the door. Provide two latching points for all tiered lockers 42" and under in height. Limit lock bar travel by contacting resilient elastomeric cushioning devices concealed inside the lock bar. Frame hooks to accept latching shall be heavy gauge steel, set close in and welded to the door frame. Continuous vertical door strike shall protect frame hooks from door slam damage. A soft rubber silencer shall be securely installed on each frame hook to absorb the impact caused by closing of the door. Weld latch guard plate on frame hook for tiered lockers.
1. Recessed stainless-steel cup with integral door pull, pry resistant and non-protruding beyond face of door.
- F. Hinges: Two for doors under 42 inches high; provide an extra hinge for doors 24 inches wide; weld securely to locker body and riveted to door. Two inches high; 5 knuckle, full loop, tight pin style.
1. Hinge Thickness: 14 gage, 0.075 inch.
- G. Trim: 18 gage, finished to match lockers.
- H. Fillers: Less than 3" wide: 16 gage; 3" to 8" wide: 14 gage; No filler shall be wider than 8". Unequal leg angle shape, slip joint filler angle formed to receive filler panel and finished to match lockers. Corner fillers shall be mitered.
- I. Integral Enclosed Locker Base: 4 inch high; 14 gauge, finish shall match locker.
- J. Coat Hooks: Stainless steel or zinc-plated steel.
- K. Number Plates: Polished aluminum plates with black numerals 1/2 inch high minimum of block font style, riveted to locker.
- L. Integral Combination Lock: Key-controlled, 3 number dialing built-in combination locks. Provide a lock for every locker door. Locks shall be capable of at least 5 different combination changes. Provide ten control keys and combination change keys. Locks manufactured by Master Lock.
- M. Accessible Lockers: See 2.05.

## **2.04 PHENOLIC LOCKERS**

- A. Lockers: Factory assembled, made of phenolic core panels with mortise and tenon joints and stainless steel mechanical joint fasteners; fully finished inside and out; each locker capable of standing alone. Base shall be provided as part of Section 06 10 54.
1. Doors: Full overlay, covering full width and height of locker body; square eased edges.
  2. Panel Core Exposed at Edges: Machine polished, without chips or tool marks; square edge unless otherwise indicated.
  3. Where locker ends or sides are exposed, finish the same as fronts or provide extra panels to match fronts.
  4. Ventilation: By holes drilled in tops, bottoms, and intermediate shelves, and by open space between the back of door and locker body.
  5. Door and Exposed End Panel Color: To be selected by Architect
  6. Concealed Body Color: Manufacturer's standard white or light color.
  7. Fasteners for Accessories and Locking Mechanisms: Tamperproof type.
- B. Component Thicknesses:
1. Doors: 1/2 inch minimum thickness with eased edges.
  2. Locker Body: Tops and bottoms 3/8 inch sides 5/16 inch; backs 1/4+ inch; minimum.
- C. Phenolic Core Panels: Nonporous phenolic resin and paper core formed under high pressure, with natural colored finished edges, integral melamine surface, matte finish, and uniform surface appearance; glued laminated panels not acceptable.

1. Surface Burning Characteristics, ASTM E84: Class B, flame spread index of 75 or less, and smoke developed index of 450 or less.
- D. Hinges: Satin finish stainless steel; 180 degree opening continuous hinges, concealed fastening, attached to back of door and inside of body with tamperproof screws.
- E. Number Plates: Manufacturer's standard, minimum 4-digit, permanently attached with adhesive; may be field installed.
- F. Fasteners: Stainless steel.
- G. Locks: Built-in combination lock with master key override, as manufactured by Master Lock. Provide 4 master keys.
- H. Exposed End Panels: Full coverage of locker ends; finished to match door color.
- I. Lock Strike: Stainless steel strike plate attached to locker body with through-bolts.
- J. Accessible Lockers: See 2.05.

## **2.05 ACCESSIBLE LOCKERS**

- A. Accessible (ADA) Lockers:
  1. Single tier or the lower portion of double tier locker. Provide interior shelf at 10" and 47" above finish floor level, in addition to standard locker hooks.
  2. Three-point latching with recessed ADA compliant lever handle and lock.
  3. Do NOT install international accessibility signage on face of locker.
  4. Identify all accessible lockers in the locker and lock combination sequence spreadsheet.
  5. Five (5) percent or not less than 1 of the total count of each type of locker for each location shall be accessible lockers. Locations, if not indicated on the Drawings, shall be located on the shop drawings by the Architect.

## **2.06 ACCESSORIES**

- A. Anchors: Select material, type, size, and finish required for secure anchorage to each substrate.
  1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance.
  2. Provide toothed-steel or expansion sleeves for drilled-in-place anchors.

## **2.06 FINISHING**

- A. Clean, degrease, and neutralize metal; prime and finish with one coat of baked enamel complying with NAAMM Finishes Manual for Architectural and Metal Products. All surfaces except aluminum, stainless steel and chrome shall be painted.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that prepared bases are in correct position and configuration.
- B. Verify bases and embedded anchors are properly sized.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install lockers plumb and square.
- C. Place and secure on prepared base.
- D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
- E. Bolt adjoining locker units together to provide rigid installation.
- F. Install end panels and filler panels.
- G. Provide any and all trim and braces required for a satisfactory installation.
- H. Install accessories.

- I. Replace components that do not operate smoothly.

**3.03 CLEANING AND ADJUSTMENT**

- A. Clean locker interiors and exterior surfaces.
- B. Remove all extraneous hardware and fasteners.
- C. Adjust doors and latches to operate easily without binding. Verify that all locks are operating properly.
- D. Touch up marred finishes, or replace locker units that cannot be restored to the satisfaction of the Architect.
- E. Upon completion of the locker installation, provide an electronic Excel spreadsheet on CD rom and two hard copies of the locker numbering and lock combination sequences for the Owner's use.

**END OF SECTION**

**SECTION 10 75 00  
FLAGPOLES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Refurbishment and salvage of existing aluminum flagpole for re-installation.
- B. Replacement of external rope halyard and flag snaps.

**1.02 RELATED REQUIREMENTS**

- A. Section 02 41 00 – Demolition: Salvage of existing flagpole and accessories.
- B. Section 03 30 00 - Cast-in-Place Concrete: Concrete base and foundation construction.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on halyard rope, snap system and accessories.
- C. Shop Drawings: Indicate detailed dimensions, and verification that halyard replacement system submitted is compatible to existing configuration and operations.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Protect flagpole and accessories from damage or moisture.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Flagpole Accessories and Components:
  - 1. American Flagpole
  - 2. Concord Industries, Inc
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 FLAGPOLES**

- A. Flagpole: Aluminum.
  - 1. Existing aluminum flagpole shall be salvaged and refurbished for re-installation as indicated on the Drawings. Inspect trucking system and other components for damage or excessive wear. Replace components that are either damaged beyond repair or that have exceeded life expectancy. Lubricate moving parts.
  - 2. New Mounting: Ground mounted type.
    - a. Provide new lightning rod ground kit including cable, rod and miscellaneous accessories as recommended by the manufacturer.
  - 3. New Halyard: Exterior type. UV, rot and abrasion resistant.
    - a. Type: Nylon, braided, with steel or bronze core.
    - b. Color: White.
    - c. Thickness: 5/16 inch.
  - 4. Snap Hooks and Covers: Heavy-duty, stainless steel with neoprene cover.
  - 5. Clean and polish all surfaces as recommended by the manufacturer.

**2.03 MOUNTING COMPONENTS**

- A. Foundation Tube Sleeve: AASHTO M 36M, corrugated 16 gage steel, galvanized, depth of as required by engineering.

**2.04 FINISHING**

- A. Metal Surfaces in Contact With Concrete: Asphaltic paint.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

**3.02 PREPARATION**

- A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

**3.03 INSTALLATION**

- A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
- B. Fill foundation tube sleeve with concrete specified in Section 03 30 00.
- C. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

**3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/2 inch.

**3.05 ADJUSTING**

- A. Adjust operating devices so that halyard functions smoothly and travels for its full length.

**END OF SECTION**



**SECTION 11 40 00****FOODSERVICE EQUIPMENT****PART 1 - GENERAL****1 RELATED DOCUMENTS**

- A The general conditions of division 1 including supplementary conditions and general requirements apply to the work specified in this section.

**2 RELATED WORK, NOT INCLUDED BY FOODSERVICE EQUIPMENT CONTRACTOR**

- A Plumbing: Refer to division 22 00 00 including
- 1 Rough-in
  - 2 Piping for supply and waste lines.
  - 3 Traps, grease traps, line strainers, tail pieces, valves, stops, shutoffs, and miscellaneous fittings required for complete installation.
  - 4 Final connection, including mounting of foodservice equipment contractor supplied faucets and waste assemblies.
- B Ventilation: Refer to division 23 00 00 including
- 1 Final utility connections.
  - 2 Exhaust Hoods and Accessories to be received and installed by HVAC contractor.
- C Electrical: Refer to division 26 00 00 including
- 1 Rough-in.
  - 2 Conduit, wiring, line and disconnect switches, safety cutoffs and fittings, control panels, fuses, boxes and fittings required for complete installation.
  - 3 Final connections, including mounting and wiring of starters and switches furnished as part of the foodservice equipment (unless otherwise indicated on the drawing).

**3 WORK INCLUDED IN THIS SECTION**

- A Furnish point of connections and install all foodservice equipment here-in, including that which is reasonably inferred, with all related items necessary to complete work shown on contract drawings and/or required by these specifications.
- B Electrical Work:
- 1 Interwiring of foodservice equipment between components within equipment, such as heating elements, switches, thermostats, motors, etc., complete with junction box or disconnect switch as is applicable, ready for final connection.
  - 2 Voltages shall be as indicated on contract drawings. Any difference in electrical characteristics at job site from those shown on contract documents must be submitted to the architect for consideration prior to ordering equipment.

## C Plumbing Work:

- 1 Furnish all equipment with faucets and sink waste assemblies as specified in this section. All plumbing fixtures to be in compliance with S.3874 (The Reduction of Lead in Drinking Water Act)

## 4 SUBMITTALS

- A Submit shop drawings as required by general conditions.
- B Shop drawings and bound brochures covering manufactured or "buy-out" items covering all work and equipment included in this contract shall be submitted to owner as soon as possible after award of contract. After approval, foodservice contractor shall furnish to architect sets of shop drawings and brochures, corrected as required by virtue of review comments, for distribution to various interested trades on project. All cost of reproduction shall be part of contract.
- C Provide fully dimensioned rough-in plans at 1/4" scale, showing all required mechanical, electrical, ventilation, water waste, and refrigeration services for equipment and rough-in locations for same. Rough-in locations shown shall make allowances for traps, switches, etc., thereby not requiring interpretation or adjustment on the part of other contractors. Drawings shall indicate dimensions for floor depressions, wall openings, etc., for equipment.
- D Foodservice equipment contractor shall visit site to verify all rough-in and sleeve locations prior to installation of finished floors, and shall cooperate with other contractors involved in proper location of same.
- E Fully dimensioned and detailed shop drawings of custom-fabricated equipment items shall be submitted, drawn at 3/4" and 1/2" scale for plans, elevations, and sections, respectively. Drawings shall show all details of construction, installation, and relation to adjoining and related work where cutting or close fitting is required. Drawings shall show all reinforcements, anchorage, and other work required for complete installation of all fixtures.
- F Do not begin fabrication of custom-manufactured equipment until approvals of shop drawings have been received, and until field measurements have been taken by foodservice equipment contractor, where such measurements are necessary to assure proper conformance with intent of contract drawings and specifications.
- G Make field measurements, giving due consideration to any architectural, mechanical, or structural discrepancies that may occur during construction of building. No extra compensation will be allowed for any difference between actual measurements secured at job site and dimensions shown on drawings. Field measurements shall be submitted to architect for consideration before proceeding with fabrication of equipment.
- H Submit illustrated brochures for manufactured or "buy-out" equipment items complete with illustrations, specifications, line drawings, rough-in requirements, and list of accessories or other specified additional requirements. Brochures shall be bound and shall

include data on all equipment that is to be provided, arranged in numerical sequence that conforms to item numbers of specifications. Omission of data does not reduce obligation to provide items as specified.

## 5 SUBSTITUTIONS – STANDARDS

- A Proposals shall be based on brands, materials, and forms of construction specified unless products of other manufacturers that conform to requirements of plan and specifications are approved in writing by owner as equal to that as specified.
- B Any equipment offered for approval as "equal" to equipment specified must conform to space limitations of layout. Cost of any deviation from kind or location of mechanical service provided in layout due to furnishing of an approved equal will be the responsibility of foodservice contractor, at no extra cost to owner.
- C If no equals are approved in writing by owner, the brands and materials specified must be furnished, and no other substitution will be permitted subsequent to award of contract except by specific change order issued by owner.

## 6 DRAWINGS

- A Drawings that constitute part of contract documents indicate general arrangement of piping and location of equipment. Should it be necessary to deviate from arrangement indicated in order to meet structural conditions, make such deviations without expense to owner.
- B Specifications and drawings are reasonably exact, but their extreme accuracy is not guaranteed. Drawings and specifications are for assistance and guidance of contractor, and exact locations, distances, and levels shall be governed by the building.

## 7 MANUFACTURER'S DIRECTIONS

- A Follow manufacturer's directions in all cases where manufacturers of articles used in this contract furnish directions or prints covering points not shown on drawings or specifications.

## 8 QUALITY ASSURANCE

- A It is required that all custom-fabricated equipment such as tables, sinks, countertops, etc., be manufactured by a foodservice equipment fabricator who has a plant, personnel and engineering required. Such manufacturer shall be subject to approval of architect. All work in the above category shall be manufactured by one manufacturer, and shall be of uniform design and finish.
- B Manufacturer of this equipment must be able to show that he is now and for the past five years has been engaged in manufacture or distribution of equipment, as required under this contract.

- C Manufacturer of this equipment herein specified shall be a recognized distributor for items of equipment specified herein that are of other manufacture than his own.
- D Only manufacturers who can meet the foregoing qualifications will be acceptable.

## 9 INDUSTRY STANDARDS

- A Electrically operated and/or heated equipment, fabricated or otherwise, shall conform to latest standards of National Electric Manufacturers Association and of Underwriters Laboratories, Inc., and shall bear the U.L. label.
- B Items of foodservice equipment furnished shall conform to standards of National Sanitation Foundation, Ann Arbor, Michigan, and shall bear the N.S.F seal.
- C Foodservice equipment shall be installed in accordance with N.S.F. standards.
- D Work and material shall be in compliance with requirements of applicable codes, ordinances, and regulations, including but not limited to those of the National Fire Protection Association, State Fire Marshal, State Board of Health, Local Health Codes, etc.
- E Rulings and interpretations of enforcing agencies shall be considered part of regulations.

## 10 EQUIPMENT HANDLING AND STORAGE

- A Deliver equipment to site, properly crated and protected, and store in safe place. Protect from damage until time for installation.

## 11 GUARANTEE

- A Equipment furnished under this contract shall be guaranteed for a period of one year from the date of final acceptance thereof against defective materials, designs, and workmanship. Upon receipt of notice of failure, any part or parts shall be replaced promptly, at the expense of foodservice equipment contractor. Until replacement equipment is installed, owner shall have full use of defective equipment. Warranty shall include labor, all parts, and driving time to and from job site.
- B This guarantee shall include installation, start-up, and one-year free service for all self-contained refrigeration equipment furnished under this contract, with evidence of manufacturer's one-year guarantee on entire cabinet, and additional four-year warranty on sealed compressor motor assembly.

## 12 OPERATING AND MAINTENANCE MANUALS

- A After completion of installation, foodservice equipment contractor shall present to owner three sets of all operating and maintenance manuals, covering all mechanically operated

equipment furnished under this contract, each set being bound in loose leaf binder having durable cover. Include in each binder a list of names, addresses, and telephone numbers of service agencies authorized to make necessary repairs and/or adjustments of equipment furnished under this contract.

## **PART 2 - PRODUCTS**

### **1 MANUFACTURED EQUIPMENT**

- A Except as may be specified otherwise under individual item specifications in "Equipment Schedule," all items of standard manufactured equipment furnished shall be complete in accord with manufacturer's standard specifications for specific unit or model called for, including finishes, components, attachments, appurtenances, etc., except as follows:
- B Substitutions for manufactured equipment specified will be accorded consideration under terms set forth in "Substitutions-Standards."

### **2 FABRICATED EQUIPMENT**

- A Work shall be done in an approved workmanlike manner, to complete satisfaction of owner.
- B Stainless steel shall be U.S. standard gauges as called for, 18-8, Type 304, not over .012% maximum carbon, No. 4 finish.
- C Galvanized iron shall be Armco or equal. Framework of galvanized iron shall be welded construction, having welds smooth, and where galvanizing has been burned off, touched up with high-grade aluminum bronze.
- D Legs and crossrails shall be continuously welded, unless otherwise noted, and ground smooth.
- E Bottom of legs at floor shall be fitted with sanitary stainless steel bullet-type foot, with no less than 1-1/2" adjustment.
- F Legs shall be fastened to equipment as follows:
  - 1 To sinks by means of closed gussets. Gussets shall be stainless steel, reinforced with bushings, having set screws for securing legs.
  - 2 To tables and drainboards with closed gussets which shall be welded to galvanized (when not exposed) or S/S (when exposed) hat channels, 14 gauge or heavier, exposed hat sections having closed ends. Bracing shall be underside of tops.
- G Closed gussets shall be 3" minimum diameter at top, welded to frame members or to sink bottom.
- H Sinks, unless otherwise specified, shall be furnished with lever-type waste outlets with connected overflows. Where exposed, furnish wastes chromium plated.

- I Rolls shall be 1 1/2" diameter, except as detailed to the contrary, with corners bullnosed, ground, and polished.
- J Seams and joints shall be shop-welded. Welds to be ground and polished to match original finish. Materials 18 gauge or heavier shall be welded.
- K Metal tops shall be one-piece welded construction, unless specified otherwise, reinforced on underside with galvanized hat channels welded in place. Crossbracing not to be more than 30" on center.
- L Drawers to be 18 gauge stainless steel channel-type housing and drawer cradle, both cradle and housing being reinforced and welded at corners, housing being secured to underside of tabletop, and both housing and cradle being sized for and fitted with 20" x 20" x 5" deep thermo plastic drawer insert having coved corners. Drawer insert shall be easily removable from cradle without tools or having to remove entire drawer.
- M Drawer fronts and doors: Except where single-pan construction is indicated, provide double-pan type, not less than 5/8" thick, with seams on inside face. Deadened sound by inserting mineral wool insulation between pans.
- N Hardware shall be solid materials and except where unexposed or specified to the contrary, of cast brass, chrome-plated. Identify all hardware with manufacturer's name and number so that broken or worn parts may be ordered and replaced.
- O Fabricate sink compartments with 3/4" coved vertical and horizontal corners. Multiple-compartment partitions to be double thickness, continuously welded where sheets join at top. Front of multiple-compartment sinks to be continuous on exterior. Bottoms to be creased to drain.
- P Ends of fixtures, splashbacks, shelves, etc., shall be finished flush to walls or adjoining fixtures.
- Q Dishtables, drainboards, splashbacks, and turn-up edges shall have radius bends in all horizontal and vertical corners, coved at intersections.
- R Rounded and coved corners or radius bends shall be 1/2" radius or longer.
- S Undersides of tops to be coated with sound deadening tacky tape. Sinks are to be coated with Component Hardware sound deadening compound.
- T Shelves are to be turned up 2" on back edge. Turn other edges down 1 1/2" to form open channels. Reinforce shelf units to support 40 lbs. per square foot loading, plus 100% impact loading.
- U Casework at fabricator's option, unless otherwise indicated. Provide either box-type framing or open-channel-type (complying with N.S.F. requirements in either case).
- V Enclosures: Except as indicated, provide each unit of casework (base, wall overhead, and free-standing) with a complete-enclosure metal cabinet, including fronts, backs, tops, bottoms, and sides.

W Metal components, unless specified or noted otherwise, to be the following gauges:

1	Tabletops	14 gauge	Stainless steel
2	Wall shelves	16 gauge	"
3	Undershelves	16 gauge	"
4	Drawer fronts (single pan)	16 gauge	"
5	Enclosed cabinet bases	18 gauge	"
6	Sinks and drainboards	14 gauge	"
7	Exhaust hoods	18 gauge	"
8	Legs (1-5/8" dia.)	16 gauge	"
9	Cross bracing (1" dia.)	16 gauge	"
10	Doors (outer pan)	18 gauge	"
11	Doors (inner pan)	20 gauge	"

### 3 HEATING EQUIPMENT

A Wherever heating equipment or thermostat control for such equipment is specified, it shall be complete, and of the materials, size, and rating specified within equipment items or details. All such equipment shall be designed and installed to be easily cleaned or to be easily removed for cleaning.

B Electrical appliances or heating element circuits of 120 volts shall not exceed 1650 watts, unless specifically shown to the contrary.

### 4 SWITCHES AND CONTROLS

A All internal wiring for fabricated equipment items, including all electrical devices, wiring, controls, switches, etc., built into or forming an integral part of these items shall be furnished and installed by foodservice equipment contractor in his factory or building site with all items complete to junction box for final connection to building lines by electrical contractor.

B Provide standard 3-prong plugs to fit "U" slot grounding-type receptacles, for all equipment items powered by plugging into 110-120 volts, single-phase AC.

### 5 CONNECTION TERMINALS

A All equipment shall be complete with connection terminals as standardized by equipment manufacture, except where specified otherwise.

### 6 LOCKS

A Fit all doors for reach-in refrigerated compartments with locking-type latches.

### 7 LAMINATE PLASTICS

A Wherever laminate plastic materials are specified, veneer all materials using urea base cement, waterproof, and heatproof. Rubber base adhesives are not acceptable. Apply

materials directly over close-grained plywood face exposed surfaces and edges with 1/16" material, and corresponding back faces with 1/32" reject material. Place top sheet on and over finished edge.

### **PART 3 - EXECUTION**

#### **1 EXECUTION**

- A Work under this contract and covered under this section of specification includes but not limited to:
  - 1 Cutting of holes and/or ferrules on equipment for piping, drains, electrical outlets, conduits, etc., as required to coordinate installation of kitchen and foodservice equipment work of the other contractors on project.
  - 2 Field checking of building and rough-in requirements, and submission of brochures and shop drawings, all as required herein before under "submittals."
  - 3 Repair of all damage to premises as result of this installation, and removal of all debris left by those engaged in this installation.
  - 4 Having all foodservice equipment fixtures completely cleaned and ready for operation when building is turned over to owner.

#### **2 INSTALLATION PROCEDURES**

- A Foodservice equipment contractor shall make arrangements for receiving his custom-fabricated and "buy-out" equipment and shall make delivery into building as requisitioned by his installation superintendent. He shall not consign any of his equipment to owner or to any other contractor unless he has written acceptance from them and has made satisfactory arrangements for the payment of all freight and handling charges.
- B Foodservice equipment contractor shall deliver all of his custom-fabricated and "buy-out" equipment temporarily in its final location, permitting trades to make necessary arrangements for connection of service lines.
- C This contractor shall coordinate his work and cooperate with other trades working at site toward the orderly progress of the project.
- D Owner or owner's agent shall have access at all times to plant or shop in which custom-fabricated equipment is being manufactured, from time contract is let until equipment is shipped, in order that progress of work can be checked, as well as any technical problems that may arise in coordination of equipment with building. Any approval given at this point of manufacturer shall be tentative, subject to final inspection and test after complete installation.
- E Foodservice equipment contractor shall assist owner, and/or owner's agent, in making any desired tests during or prior to final inspection of equipment; he shall remove immediately any work or equipment rejected by owner, and/or owner's agent, replacing the same with work conforming to contract requirements.



- F This contractor shall keep premises free from accumulation of his waste material and rubbish, and at completion of his work shall remove his rubbish and implements, leaving areas of his workroom clean.
  - G This contractor shall provide and maintain coverings or other protection for finished surfaces and other parts of his equipment subject to damage during and after erection. After removal of protective coverings, all field joints shall be ground and polished, and entire work shall be thoroughly cleaned and polished.
- 3 TRIMMING AND SEALING EQUIPMENT
- A Seal completely spaces between all units to walls, ceilings, floors, and adjoining (not portable) units with enclosed bodies against entrances of food particles or vermin by means of trim strips, welding, soldering, or commercial joint material best suited to nature of equipment and adjoining surface material.
  - B Close ends of all hollow sections.
  - C Equipment butting against walls, ceilings, floor surfaces, and corners to fit tightly against same; backsplashes or risers that fit against wall to be neatly scribed and sealed with a N.S.F. approved clear silicone sealant, wiping excess out of joint to fillet radius. Where required to prevent shifting of equipment and breaking wall seal, anchor item to floor or wall.
- 4 TESTING AND DEMONSTRATION OF EQUIPMENT
- A After complete installation, all items of equipment furnished under this contract shall be thoroughly tested to ensure proper and safe operation.
  - B Foodservice equipment contractor shall arrange to have all manufactured, mechanically operated equipment furnished under this contract demonstrated by manufacturer's representatives. These representatives to instruct owner's designated personnel in use, care, and maintenance of all items of equipment after same are in working order. Demonstration and instruction shall be held on dates designated by owner.
  - C Foodservice equipment contractor shall provide a competent service representative to be present when installation is put into operation.
- 5 ITEMIZED SPECIFICATIONS

### **Cafeteria Kitchen**

Item #: 1  
Description: Walk-In Cooler  
Manufacturer: Bally  
Model #: Custom  
SIS #: T037  
Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

Sectional walk-in refrigerators and freezers complete with doors shall be manufactured by Bally Refrigerated Boxes, Inc. Unit to be complete as shown on plans and in detail. Overall size of walk-in shall be 19'-3" by 8'-8 1/2" by 8'-6" high with floor.

Foam core of panels shall be Underwriters Laboratories-listed as having flame spread of 25 or lower and smoke generation of 450 or lower when tested in accordance with ASTM E-84-76. Panel shall be approved by Factory Mutual as a Class I building type. They shall be foamed using HCF 245A expanding agent and shall have a zero ozone depletion factor. The use of any expanding agent using R-22 and/or Pentane are specifically excluded.

All work and materials shall be in full accordance with local and/or state ordinances, and with any other prevailing rules and regulations. Bally Refrigerated Boxes, Inc. is not responsible for furnishing items required by regulations, unless specified or shown on the drawings or contained in the specifications.

Panels shall consist of interior and exterior metal skins precisely formed with steel dies and roll-form equipment and thoroughly checked with gauges for accuracy. The metal skins shall be placed into heated molds and liquid urethane injected between them.. Urethane shall be foamed-in-place (poured, not frothed) and, when completely heat cured, shall bind tenaciously to the metal skins to form an insulated panel. Panels shall contain 100 percent urethane insulation and have no wood or structural members between the skins. To insure tight joints, panel edges must have foamed-in-place tongues and grooves with a flexible vinyl gasket on the interior and exterior of all tongue edges. Gaskets shall be resistant to damage from oil, fats, water and detergents and must be NSF-approved. Panel thickness shall be 4 inches.

Finishes:

- Interior Floor: Galvanized (16 GA)
- Interior Walls: Embossed White (190 Series)
- Interior Ceiling: Embossed White (190 Series)
- Exposed Exterior Walls: Embossed White (190 Series)
- Exterior Floor: Embossed White (190 Series)
- Exterior Ceiling: Walls: Embossed White (190 Series)

All panels except corner panels shall be made in 23" and 46" widths, fully interchangeable for fast, easy assembly. Panels 11-1/2", 17-1/4" or 34-1/2" wide are to be furnished only if required to fit the allocated space. To assure perfect alignment and maximum strength, corner panels shall employ a right-angle configuration with exterior horizontal dimensions of 12" on each side.

Panels shall be equipped with Bally Speed-lok diaphragmatic joining devices. The distance between locks shall not exceed 46". Each device shall consist of a cam-action, hooked locking arm placed in one panel, and a steel rod positioned in the adjoining panel, so that when the arm is rotated, the hook engages the rod and draws the panels tightly together with cam action. Arms and rods shall be housed in individual steel pockets. Pockets on one side of the panel shall be connected to pockets on the other side in width, by use of 2"-wide metal straps set into and completely surrounded by the insulation. When panels are joined together, these straps shall form lock-to-lock connections for extra strength.

Floor Construction: Bally furnishes floor panels only. All construction and preparation for Bally floor panels must be provided by others. Floor panel construction shall be similar to

that described in sections 7 and 8 above, but with 16-gauge smooth galvanized interior skin; thickness of floor panel shall be 4" and is NSF-approved. Floor panels shall be placed in a rough depression in floor 6" below finished floor of kitchen and leveled. A 2" thick finished floor shall be installed on top of walk-in floor panel as shown in detail. Setting bed and finished floor finish to be supplied and installed by others. Door shall be cut to accept tile and grout under door threshold.

Hinged Entrance Door Panels: Each door shall be 34" wide x 78" high. The number of doors, location and direction of swing is specified on the plans. Doors are in-fitting and flush-mounted. Construction shall be as specified in section 7 above. Magnetic core, thermoplastic gaskets installed on the top edge and both sides of the door shall keep the door in a closed position, forming a tight seal; a flexible, dual-blade wiper gasket shall be installed at the bottom of the door. NSF-approved gaskets shall be replaceable and resistant to damage from oil, fats, water and detergent. A heavy U-channel structural steel frame around the perimeter of the door opening shall prevent racking or twisting; steel frame is to be reinforced for hardware attachment. Anti-condensate heater wire shall be concealed behind the metal edge of the door jambs. the door panel shall also include a vapor-proof interior lamp; junction box for 120-Volt, 60 cycle, 1 phase, a.c. service (15 amp maximum); 2"-dia. flush-face dial thermometer. Hardware shall be two spring-loaded, self-closing hinges; cylinder latch with provision for padlocking and safety release mechanism; door closer. All with satin aluminum finish.

Options and Accessories:

- Walk-in doors shall be modified to accept a tile and grout floor under threshold.
- Floor to be installed on rough depression in floor 6" below finished floor of kitchen and leveled. A 2" thick finished floor shall be installed on top of walk-in floor panel as shown in detail. Setting bed and finished floor to be supplied and installed by others.
- Each door shall be complete with a 14" x 24" three pane heated observation window.
- Each door to be complete with strip curtains.
- Trim pieces to seal off box from walls and ceiling.
- Super door feature: Each door shall be complete with 3 heavy duty spring mounted hinges and aluminum diamond plate mounted on the interior and exterior of each door and frame 32" high.
- Alarm System: Each compartment shall be supplied with Audio-Visual Alarm with digital temperature readout Hi/Low set point with dry contact. Modularm model 75LC Multi-Monitor.
- Bally standard pressure relief port. (Freezer Compartment)
- (2) Two Kason LED 1810 48" light with strips. (1 per compartment)

Mechanical Refrigeration System: Bally shall provide pre-assembled remote quiet line refrigeration equipment which shall include all necessary components factory installed on both evaporator and condensing units. All components shall be pre-wired, so that job site work is limited to making electrical connection to each condensing unit and each evaporator, interconnecting wiring between assemblies is specifically excluded. Contractor shall be responsible for all refrigeration tubing connections between the assemblies. All necessary electrical equipment and refrigeration tubing shall be furnished by the electrical and refrigeration contractors. Contractor shall supply pre-assembled remote systems which

include mounted expansion valve and liquid solenoid. All coils to be constructed of heavy gauge aluminum with easy access/quick disconnect fan, motor and mount assemblies. All evaporators shall be equipped with Bally SmartVap Controller and shall include lockable disconnect switch mounted on evaporator. The SmartVap shall control all defrost and thermostat operations. The controller will allow for tighter control of the temperature within the walk-in. Fan guard shall be constructed of high density polyethylene with built-in throw boosters. Electric defrost coil shall include corrosion proof stainless steel heater elements. Easy access to heaters (mounted on face or bottom of coil not requiring end clearance). Condensing units shall be air-cooled, semi-hermetic, outdoor units with the following features. Weatherproof electric control panel with compressor contactor, on/off switch and fused control circuit. Discharge vibration eliminator. Fan guard. Spring mounted accessible semi-hermetic compressor. Adjustable dual pressure control. Oil failure control on all applicable models. Large receiver with fusible plug and valves. Copper tubing secured with Hydrosorb, Crush-a-Clamp. Liquid line filter drier (sweat connection), sight glass, shut-off valve. Removable hood. Crankcase heater. Energy efficient PSC condenser fan motors. Fan cycle control on two fan models over 2-HP. Head pressure control valve (adjustable type on low temp, fixed type on med or high temp). Suction filter and vibration eliminator, 2-HP and larger.

Cooler:	Compressor:	BQHA 008 E6 HS2AD
	Evaporator Coil:	BLP 209MA-SV-S1BEC
Freezer:	Compressor:	BQZA 020 L6 HT3AD
	Evaporator Coil:	BLP 209LE-SV-S2BEC

Refrigerant shall be R404-A on both coolers and freezers.

Each refrigeration system to be complete with the following options:

- Heated and insulated receiver. (Below 10 degrees)
- Wind Guard.

Piping: Furnish and install the interconnecting piping between the condensing unit and the respective unit coolers. Piping shall be installed in a neat and workmanlike manner with adjustable hangers spaced at no more than six (6) foot intervals on horizontal runs; and six (6) foot intervals on vertical runs.

Line sizes shall be in accordance with Copeland Handbook standards and best refrigeration practice, to assure: Proper feed to evaporator, Avoid excessive pressure drop, Prevent excessive amounts of lubricating oils from being trapped in any part of the system, Protect the compressor from loss of lubrication at all times, Prevent liquid refrigerant from entering the compressor during operating or idle time, To maintain a clean and dry system.

Refrigeration Piping shall be type "L" ACR grade, hard-drawn seamless copper tubing, Wrought type copper fittings, Silver-bearing soldered joints.

Condensate Drain: Furnish and install condensate drain piping from the unit cooler to open drain. Piping shall consist of: 7/8" type "L" copper tubing supported 36" on center maximum, in such a way that there will be 1" clearance between the wall and the tubing. Provide a union or slip fitting at the connection to the evaporator drain pan to allow easy disassembly for service and cleaning. drain piping shall be "P-Trapped" and pitched at least 1" per foot thru the wall of the refrigerated area and discharged with-in 2" of a floor drain. Freezer drain line shall be wrapped with heat tape and insulated to prevent condensate freezing.

Piping Insulation: Suction line shall be covered with 1/2" thick Armaflex insulation, the insulation shall be applied to these lines in accordance with manufacturer's

recommendations and, as they are being installed so that insulation will not be split. All joints shall be completely sealed with overlapping, cemented material to prevent the formation of frost on the lines. Penetrations shall be sealed with non-hardening caulking compound. The exposed ends of the penetration must be trimmed.

Refrigerant Testing: each system shall be triple-evacuated prior to charging. Fifteen hundred (1500) and Five Hundred (500) microns of vacuum shall be drawn successively and broken with dry refrigerant. After the third evacuation, the system shall be charged.

Guarantee: The equipment shall be guaranteed to maintain the specified temperatures. All mechanical refrigeration equipment shall be mechanically guaranteed for a period of one (1) year after date of acceptance of owner. The emergency service shall be provided free of charge, whenever necessary on a 24 hour, seven day-per-week basis. Any leaks that occur during the first year of operation after acceptance by the owner, shall be repaired and the necessary refrigerant added at no expense to the owner. The year service shall be provided by the installing company and under no circumstances will the service be sublet to another refrigeration contractor. The name of the installer/service agency for the guarantee period shall be located in a highly visible place on the condensing unit. The complete refrigeration package shall be provided with a (5) year parts warranty. This includes both the condensing unit and evaporator coil in their entirety as supplied by Bally.

Warranties: Bally shall warrant that any part of the structure it supplies (except the refrigeration system and its related accessories) is free from defects in materials or workmanship under normal use and service. The insulated panel portion of the structure is warranted free of defects under normal use and service for a period of ten (10) years from date of installation (but in no event shall the warranty be in force for more than ten (10) years and six (6) months from the date the product was first shipped by Bally). Panel surface condition is warranted free from defects under normal use and service for one year from installation, provided the panel is stored and installed according to Bally's instructions. Mechanical (including hardware, gaskets, Speed-lok assemblies, aluminum weather roofs) and electrical components, except refrigeration systems (which are covered by a separate warranty) are warranted to be free from defects under normal use and service for one year from date of installation. (In no case shall this portion of the warranty be in force for more than one year and six months from date the product was first shipped from Bally.) The warranty shall not include any labor charges for replacement or repair of defective parts or refrigeration. Full warranty information is to be provided with the walk-in.

Item #: 2

Description: Evaporator Coil, Cooler

Manufacturer: Bally

Model #: BLP 209MA-SV-S1BEC

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 1.

Item #: 3

Description: Compressor, Cooler

Manufacturer: Bally

Model #: BQHA 008 E6 HS2AD

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 1.

Item #: 4

Description: Walk-In Freezer

Manufacturer: Bally

Model #: Custom

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 1.

Item #: 5

Description: Evaporator Coil, Freezer

Manufacturer: Bally

Model #: BLP 209LE-SV-S2BEC

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 1.

Item #: 6

Description: Compressor, Freezer

Manufacturer: Bally

Model #: BQZA 020 L6 HT3AD

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 1.

## Item #: 7

Description: Shelving Unit (Cooler/Freezer)

Manufacturer: Cambro

Model #: Elements Series

SIS #: T037

Quantity: 9

Alternate Manufacturer: Metro

## Specification:

Each unit to be a 4-Shelf Cambro Elements Series Starter Stationary Unit with the following features: Shelf Plates only with Camguard antimicrobial. 3 Post Heights 64", 72", 84". 3 Shelf Widths 18", 21", 24". 5 Shelf Lengths 36", 42", 48", 54", 60".

Each Starter Unit shall include: 4 stationary posts with leveling feet installed pre-assembled with post connectors and wedges, 1 bag of 32 stationary traverse dovetails (16 ea. A and B), Vented shelf plates (for 4 shelves), 8 stationary traverses and instructions.

Posts: Proprietary non-corrosive composite material. Post Connectors: Glass Filled Polypropylene. Traverses: Proprietary non-corrosive composite material. Vented/Solid Shelf Plates: Reinforced polypropylene with Camguard antimicrobial. Corner Connectors: Glass Filled Polypropylene. Adjustable Foot: Glass Filled Nylon. Seismic Foot: Stainless Steel post and wide foot plate, 3 holes for bolts. (Bolts not provided) Divider Bars: Glass Filled Nylon. Wall Fastener: Stainless Steel. Dovetails: Resin Nylon Wedges: Resin Polypropylene

(2) Two units at 21" x 42" x 72" high. (Model # ESU214272V4)

(3) Three units at 21" x 48" x 72" high. (Model # ESU214872V4)

(2) Two units at 21" x 54" x 72" high. (Model # ESU215472V4)

(2) Two units at 21" x 60" x 72" high. (Model # ESU216072V4)

## Item #: 8

Description: Mop Sink Cabinet

Manufacturer: Advance/Tabco

Model #: 9-OPC-84DR

SIS #: T037

Quantity: 1

Alternate Manufacturer: IMC Teddy, Eagle

## Specification:

Unit to be model 9-OPC-84DR Double Width Mop Sink Cabinet as manufactured by Advance/Tabco and with the following features:

## Features:

- Double Width Cabinet
- 16" x 20" x 12" Sink Bowl - (drain included)
- Opening for mop bucket to roll in Ventilation Slots
- Hinged Double Doors
- 4 Fixed Intermediate Shelves (3 in storage side, 1 above sink)
- 2 Mop Holders (1 on either side - above mop sink)

## Construction:

- All TIG welded.
- Welded areas blended to match adjacent surfaces and to a satin finish.

## Materials:

- 16 gauge type “304” Series Sink Bowl
- 18 gauge type “304” Series Sink Bowl Apron
- 18 gauge type “430” Series Stainless Steel Cabinet

## Unit to be complete with the following options and accessories:

- TA-46 Door Lock
- K-94-BACK Add 430 Stainless Steel Back Panel
- K-240 Service Faucet

## Item #: 9

Description: Shelving Unit (Dry Storage)

Manufacturer: Cambro

Model #: Elements Series

SIS #: T037

Quantity: 7

Alternate Manufacturer: Metro

## Specification:

Each unit to be a 4-Shelf Cambro Elements Series Starter Stationary Unit with the following features: Shelf Plates only with Camguard antimicrobial. 3 Post Heights 64", 72", 84". 3 Shelf Widths 18", 21", 24". 5 Shelf Lengths 36", 42", 48", 54", 60".

Each Starter Unit shall include: 4 stationary posts with leveling feet installed pre-assembled with post connectors and wedges, 1 bag of 32 stationary traverse dovetails (16 ea. A and B), Vented shelf plates (for 4 shelves), 8 stationary traverses and instructions.

Posts: Proprietary non-corrosive composite material. Post Connectors: Glass Filled Polypropylene. Traverses: Proprietary non-corrosive composite material. Vented/Solid Shelf Plates: Reinforced polypropylene with Camguard antimicrobial. Corner Connectors: Glass Filled Polypropylene. Adjustable Foot: Glass Filled Nylon. Seismic Foot: Stainless Steel post and wide foot plate, 3 holes for bolts. (Bolts not provided) Divider Bars: Glass Filled Nylon. Wall Fastener: Stainless Steel. Dovetails: Resin Nylon Wedges: Resin Polypropylene

(2) Two units at 21" x 36" x 72" high. (Model # ESU213672V4)

(1) One unit at 21" x 42" x 72" high. (Model # ESU214272V4)

(1) One unit at 21" x 48" x 72" high. (Model # ESU214872V4)

(1) One unit at 21" x 54" x 72" high. (Model # ESU215472V4)

(2) Two units at 21" x 60" x 72" high. (Model # ESU216072V4)

## Item #: 10

Description: Hand Sink

Manufacturer: Advance/Tabco

Model #: 7-PS-90

SIS #: T037

Quantity: 2



Alternate Manufacturer: Eagle

Specification:

Unit to be model 7-PS-90 Stainless Steel Hand Sink, Pedestal Base as manufactured by Advance/Tabco and with the following options:

Features: One piece Deep Drawn sink bowl design. Sink bowl is 10" x 14" x 5". All sink bowls have a large liberal radii with a minimum dimension of 2" and are rectangular in design for increased capacity. Keyhole wall mount bracket. Stainless steel basket drain 1-1/2" IPS. Flush-to-wall unit. "Hands Free" splash mounted gooseneck faucet furnished with aerator. Foot Pedal Valve for water operation. Easy removable panel to access hidden plumbing.

Construction: All TIG welded. Welded areas blended to match adjacent surfaces and to a satin finish. Die formed Countertop Edge with a No-Drip offset. One sheet of stainless steel - No Seams.

Material: Heavy gauge type 304 series stainless steel. Wall mounting bracket is galvanized and of offset design. All fittings are brass / chrome plated unless otherwise indicated.

Mechanical: Faucet supply is 1/2" IPS male thread hot and cold. Single pedal mixing valve with brass & rough chrome plated with built in check valve. Front operated temperature adjustment. (Contractor on site must connect faucet to foot pedal operated valves.)

Item #: 11

Description: Exhaust Hood

Manufacturer: Captive-Aire

Model #: 6030ND-2-PSP-F

SIS #: T037

Quantity: 1

Alternate Manufacturer: Gaylord, Avtec, Halton

Specification:

Units to be model 6030ND-2-PSP-F 15'-0" long exhaust-only wall canopy hood with front perforated supply plenum with built-in 3" back standoff as manufactured by Captive-Aire and with the following features:

Unit to be size and shape as shown on plans and in details.

Description: The model ND is a Type I, double island, exhaust canopy used for collection and removal of grease-laden vapors and smoke over all types of restaurant equipment.

Application: The hood shall provide flexibility in designing kitchen ventilation equipment and shall be tested and listed for use over 450°F light/medium duty cooking surfaces; 600°F heavy duty cooking surfaces; and up to 700°F extra heavy duty cooking surfaces.

Construction: The hood shall be constructed of type 430 stainless steel with #3 or #4 polish where exposed. All seams shall be welded or in conformance with UL 710 standards. Unexposed surfaces shall be constructed of aluminized steel, Individual component construction shall be determined by manufacturer and ETL, Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints and penetrations of the hood where grease-laden vapors and exhaust gases are present must be liquid-tight, continuous external weld in accordance with NFPA 96.

The hood shall be constructed to include: A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA90A and 90B. An Integral

front baffle to direct grease laden vapors toward the exhaust filter bank. An integral grease drain system on the hood back with a minimum 1/8" per foot slope, to include an exposed, removable 1/2-pint grease cup to facilitate cleaning. A built-in wiring chase for electrical controls on the front face of the hood designed to avoid penetration of the capture area and eliminate the need for an external chaseway. UL Incandescent light fixtures and globes, allowing up to a 100-watt standard light bulb, installed and pre-wired to a junction box and installed with a maximum of 3'-6" spacing on center. Exhaust duct collar 4" high with 1" flange. A minimum of four connections for hanger rods. Connectors shall have 9/16" holes pre-punched in 1-1/2" x 1-1/2" angle iron at the factory to allow for hanger rod connection by others. UL Classified aluminum baffle filters, with size and quantity determined by the hood's dimensional parameters, but extending the full length of the hood with filler panels not to exceed 6".

Certification: The hood shall be ETL Listed, comply with UL 710 Standards and shall be built in accordance with NFPA96. Hood shall be tested for compliance with the ETL Sanitation Mark.

Documentation: Manufacturer shall furnish complete computer generated submittal drawings including hood section view(s), plan view(s), duct sizing, and CFM and static pressure requirements. Static pressure, air velocity and air volume requirements indicated on drawings shall be precise and accurate and hood shall perform to said specifications. Drawings shall be available to the engineer, architect and owner for their use in construction, operation and maintenance.

The hood shall contain a factory engineered and pre-piped, U.L. Listed, Wet Chemical, Ansul R-102 fire suppression system. The system piping shall be installed in the hood at the time of construction by Captive-Aire. Piping shall be installed above the hood and shall be concealed from view. No exposed piping is acceptable, with the exception of the appliance drops. A certified local Ansul distributor shall be selected by the factory for final system hook-up. The hood manufacturer shall be responsible for the coordination between the contractor and Ansul distributor for the final field hook-up and certification of the fire suppression system.

The system shall be capable of automatic detection and actuation and/or remote manual actuation. The system shall have the fire suppression capabilities to protect the duct(s), plenum(s), filter area(s) and cooking equipment. Accessories shall be available for mechanical or electrical gas line shut-off applications and a double-pole, double-throw micro switch for activation of a shunt trip breaker (provided by others) for electrical equipment. The system shall also include the release assembly, agent tank, detectors, fusible links, liquid tight fittings, 1-1/4" mechanical gas valve, recessed remote manual pull station, and schedule 40 black iron pipe with chrome sleeving for exposed areas.

The hood shall be complete with the following options and accessories:

- 430 Stainless Steel where exposed.
- Insulation for the PSP housing – front.
- Utility Cabinet on the Right Side.
- Filters – (11) Eleven 20" tall x 16" wide stainless steel Captrate Solo filter with hook, ETL Listed. Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.
- (5) Five L55 series E26 canopy light fixture – high temp assembly. Includes clear thermal and shock resistant globe (L55 Fixture).
- (5) Five Screw in 12W LED Bulb, L55 Series E26 Canopy Light Fixture – High Temp Assembly, 2700K-3500K, Includes Clear Thermal and Shock Resistant Globe.

- (2) Two Exhaust Riser – Factory installed 12” diameter x 4” height.
- (4) Four Supply Riser – 10” x 28” supply riser with volume dampers.
- (2) Two ½ pint grease cup new style, flanged slotted.
- Field wrapper: 12” high, front, left and right.
- (1) One Backsplash: 80” high x 193” long 430 stainless steel horizontal. (Includes end caps and divider bars.
- (1) One Left Sidesplash: 80” high x 60” long 430 stainless steel horizontal. (Includes end caps and divider bars.)
- (1) One Left End Standoff (Finished) 1” wide 60” long insulated.
- (1) One Backsplash – Inside Corner 80” high x 2” leg Length 430 Stainless Steel Vertical. (Includes end caps and divider bars.)
- (1) One Structural Front Panel
- (1) One Vertical End Panel 27” Top Width, 21” Bottom Width, 80” High Insulated 430 stainless steel.
- (1) One Electrical package installation in utility cabinet by Captive-Aire.

Hood to be complete with a Demand Control Ventilation Electrical System:

Application: The Demand Control Ventilation System (DCV) is designed to automatically reduce exhaust and supply airflow quantities, while ensuring hood performance is maintained. The DCV uses Variable Frequency Drives (VFD) and temperature sensors in the exhaust ducts to modulate the fans speed during cooking operation and maximize energy savings. The LCD screen interface provides fan(s) control, system configuration, and diagnostic information.

Construction:

The DCV includes:

- Smart Controller
- LCD Screen Interface
- Duct Temperature Sensor(s)
- Room Temperature Sensor
- Variable Frequency Drive(s)

Controls shall be listed by ETL (UL 508A).

The system includes a LCD screen interface for fan(s) and hood lights control, wash control (if applicable), gas valve reset, programmable schedule, Max Air Override function, Preparation Time mode, Cool Down mode, and diagnostics including VFD status. The LCD screen shows descriptive plain text explaining the functions or values.

The LCD screen interface will be installed on the face of the hood, on the face of the utility cabinet or on the face of a wall mounted control enclosure.

Control enclosure will be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. Control enclosure may be constructed of stainless steel or painted steel.

The smart controller will constantly monitor the exhaust air temperature through the riser mounted temperature sensor and modulate the fan speeds accordingly.

A room temperature sensor will also be provided for field installation in the kitchen space in order to start the fan(s) based on the temperature differential between the room and the exhaust air in the duct rather than fixed set-points.

A Preparation Time Mode is available for morning operation: dedicated make-up air will be locked out only allowing the use of transfer air during this mode. Exhaust fan(s) will run at low CFM while maintaining a balanced kitchen pressure.

A Cool Down Mode is designed for equipment cool-down period at the end of the daily cooking operations: similarly to Preparation Time mode, dedicated make-up air will be locked out only allowing the use of transfer air during this mode. Exhaust fan(s) will run at low CFM while maintaining a balanced kitchen pressure.

Fan maximum/ minimum speeds will be adjustable for proper kitchen balance. Fan direction change is also available from the smart controller configuration menu without need for rewiring.

Duct Temperature Sensor(s) will be mounted in the exhaust hood riser(s). Temperature probe will be constructed of Stainless Steel. System will be factory pre-set to modulate fan speed within a range of 45°F for 600°F and 700°F cooking applications and a range of 5°F for 400°F cooking applications. Set points are fully adjustable through the touch screen interface based on application needs.

The Max Air Override will have an adjustable timeout value.

The panels include color-coded wiring with as-built wiring diagrams and spare terminals controlled by the fire system micro switch. The panel is factory pre-wired to shut supply fans down in a fire condition. Options to turn ON the exhaust fans or turn off the hood lights in a fire condition will be configurable through the smart controller, but only through a password protected menu to prevent any changes after a fire inspection has been performed.

Item #: 12

Description: Convection Oven, Double

Manufacturer: Blodgett

Model #: DFG-100-ES-Double

SIS #: T037

Quantity: 1

Alternate Manufacturer: Garland, Southbend, Vulcan

Specification:

Unit to be model DFG-100-ES-Double Full-Size Convection Oven as manufactured by Blodgett and with the following features:

Exterior Construction:

- Full angle-iron frame
- Stainless steel front, top, and sides
- Dual pane thermal glass windows encased in stainless steel door frames
- Powder coated door handle with simultaneous door operation
- Triple-mounted pressure lock door design with turnbuckle assembly
- Ball bearing slide out front control panel for easy cleaning
- 1" solid block plus 1" mineral fiber insulation for a total of 2" of insulation

Interior Construction:

- Double-sided porcelainized baking compartment liner (16 gauge)
- Stainless steel combustion chamber
- Single inlet blower wheel
- Five chrome-plated racks, eleven rack positions with a minimum of 1-5/8" (41mm) spacing

- Removeable crumb trays
- Interior halogen lights

**Operation:**

- Direct fired gas system
- Electronic spark ignition control system
- Removable inshot burners
- Internal pressure regulator
- Manual gas service cut-off switch located on the front of the control panel
- Solid state thermostat with temperature control range of 200°F (93°C) to 500°F (260°C)
- Two speed fan motor (single speed in CE model)
- 3/4 horsepower blower motor with automatic thermal overload protection
- Control area cooling fan

**Standard Features:**

- SSD - Solid state digital control with LED display, Cook & Hold and Pulse Plus®
- 25" (635mm) adjustable stainless steel legs (for single units)
- 6" (152mm) adjustable stainless steel legs (for double sections)
- Three year parts and two-year labor warranty
- Five-year limited oven door warranty\*

**Unit to be complete with the following options and accessories:**

- (1) One set of 6" casters.
- (1) One gas manifold for double sections.
- (1) One Dormont model 1675KITCFS48PS, 48" long 3/4" flexible gas hose with quick disconnect, restraining device and Posi-Set.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

**Item #: 13**

Description: Range, 6-Burner

Manufacturer: Vulcan

Model #: 36S-6B

SIS #: T037

Quantity: 1

Alternate Manufacturer: Garland, Southbend, Jade

**Specification:**

Unit to be model 36S-6B Endurance Gas Range, 6-Open Burners, Standard Oven Base as manufactured by Vulcan and with the following features:

36" wide gas restaurant range, fully MIG welded aluminized steel frame for added durability. Stainless steel front, sides, backriser, highshelf and 6" adjustable legs. Extra deep crumb tray with welded corners. Six 30,000 BTU/hr. open top burners with lift-off burner heads. Energy saving flashtube open burner ignition system (one pilot for every two burners) shrouded for reliability. Heavy duty cast grates, easy lift-off 12" x 12 1/2" in the

front and 12" x 14 1/2" in the back to better accommodate stock pots or large pans. Grates have a built-in aeration bowl for greater efficiency. Burner knobs are cool to the touch, high temperature material. One oven: 35,000 BTU/hr. standard bakers depth ovens with porcelain oven bottom and door panel, measures 27" d x 26-3/8" w x 14" h. Oven thermostat adjusts from 250°F to 500°F with a low setting. Oven is supplied with two racks, two rack guide sets, and four rack positions. Oven door is heavy duty with an integrated door hinge/spring mechanism requiring no adjustment. 3/4" rear gas connection and pressure regulator. Total input 215,000 BTU/hr.

Unit to be complete with the following options and accessories:

- (1) One set of four casters.
- (1) One Dormont model 1675KITCFS48PS, 48" long 3/4" flexible gas hose with quick disconnect, restraining device and Posi-Set.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

Item #: 14

Description: Tilting Skillet, 30-Gallon

Manufacturer: Market Forge

Model #: 30P-STGL

SIS #: T037

Quantity: 1

Alternate Manufacturer: Cleveland, Groen, Vulcan

Specification:

Unit to be a Market Forge Gas UniVerse Plus Tilting Skillets model 30P-STGL, 30-gallon (87-liter) pan body with 93,000 BTU input. Unit shall be open-leg frame assemblies with manual and power tilt capabilities.

Benefits: The Heavy-duty construction of the Universal Plus Skillet incorporate sides formed of 10 gauge stainless steel and a 5/8" thick stainless steel clad plate that will provide a rigid flat cooking surface with improved heat distribution. The balanced design of the pan allows the operator to easily and quickly tilt to the desired position. Our new power tilt operates smoothly, with manual override that works easily when needed and without the use of tools or drills as required by other manufactures.

Construction: The UniVerse Plus Skillet has a fully polished stainless steel cooking surface that reduces food from adhering and helps to safely clean the equipment. Gas burners turn off automatically when the cooking pan is tilted from the horizontal position. The skillet is provided with a heavy-duty spring assisted cover with condensate vent. The cooking pan and cover are supported by two consoles with a fully welded stainless steel tubular frame system that provides stable support to the unit.

The consoles are completely covered with stainless steel that provides protection to the controls and is also easily cleanable and provides clear access for easy floor cleaning. The sloped front of the pan allows for complete draining of the pan when tilted to 70°. The tilting mechanism includes a precision ground and polished worm for smooth and long lasting tilt operation and positive control with a collapsible hand crank. A power tilting

option is available and is also supplied with the collapsible handle for manual override operation if required.

Technical Specifications: Cooking Pan: The unitized cooking pan with integral clad plate cooking surface is welded with full penetration to resist cracking due to expansion and contraction. The polished cooking surface resists product adherence and improves cleanup and appearance. The pan incorporates an easy-pour lip and 5-gallon increment markings. The clad plate cooking surface has integrally welded labyrinth fins for positive control and heat transfer from the reliable atmospheric burners. An interlock switch is provided to turn the burners off when the pan is tilted more than 10° from the normal horizontal position, the spring assisted cover with integral vent, condensate drip guide and full width handle affords effortless operation and will maintain an open position. Controls: The skillet comes standard with a solid-state temperature control with a positive OFF position and 100°-450° Fahrenheit scale, a pilot light to indicate when the burners are ON, spark pilot ignition system as standard and a 1 hour mechanical timer is included. The optional power tilting mechanism also utilizes an UP/DOWN rocker switch. The manual tilting mechanism uses a collapsible hand crank conveniently located below the control panel. The controls are resistant to dripping and light splashing water (NEMAT-2).

Operation shall be by: The Universe Tilting Plus Skillets model 30P-STGL will be rated at 93,000 BTU at 3.5- W.C. natural gas and 10" W.C. propane gas.

Unit shall be complete with the following options:

- (1) One power tilt mechanism.
- (1) One double pantry faucet.
- (1) One pan support.
- (1) One pull-out sliding sink drain with splash shield.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

Item #: 15

Description: Steamer

Manufacturer: AccuTemp

Model #: E62083D150SGL

SIS #: T037

Quantity: 1

Alternate Manufacturer:

Specification:

Unit to be model E62083D150SGL Stand Mounted Connectionless Evolution 6 Pan, Electric Boiler-Free Convection Connectionless Steamer as manufactured by AccuTemp and with the following features:

Evolution steamer is AccuTemp Products' connectionless, boilerless steam cooker that utilizes AccuTemp's Patent Pending Steam Vector Technology for faster cook times, improved energy efficiency, better pan to pan uniformity. Steam Vector Technology requires no moving parts inside the cooking chamber. Steam to be produced inside the

cooking cavity with no heating element exposed to water. No water or drain line. Unit to include low water, high water, over-temp warning lights and auto shut off feature. Evolution to include heavy duty, field reversible door. Standard digital controls with independent timer. No water quality exclusions to warranty and no water filtration or treatment required. Unit to be UL Safety and Sanitation Certified, and Energy Star qualified. Built in USA.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

Item #: 16

Description: Mixer, 30-Quart

Manufacturer: Hobart

Model #: HL300

SIS #: T037

Quantity: 1

Alternate Manufacturer: Globe

Specification:

Unit to be model HL300 30-Quart Mixer as manufactured by Hobart and with the following features:

Motor: 3/4 H.P. high torque motor. 200-240/60/3 2.8 amps.

Electrical: 200-240/60/3, – UL listed.

Controls: Magnetic contactor with thermal overload protection. Internally sealed “start-stop” push buttons. A 15-minute smart timer is standard. Smart timer includes automatic time recall, which remembers the last time set for each speed. Optional smartplus2 programmable recipe timer allows operators the ability to program up to 4 recipes with 5 steps per recipe. Smartplus2 automatically changes speeds and starts timer count-down without operator intervention.

Transmission: Gear-driven. gears are constant mesh heat-treated hardened alloy steel along with anti-friction ball bearings. Grease lubricants furnished to all gears and shafts.

Speeds: Agitator (RPM) Stir 58, First (low) 94, Second (intermediate) 174, Third (high) 317. Attachment (RPM) Stir 34, First (low) 54, Second (intermediate) 100, Third (high) 183. Bowl guard: Heavy-duty stainless steel wire front and solid rear portion. Front portion of guard rotates easily to add ingredients and install or remove agitator. It detaches in seconds for cleaning in dishwasher or sink. rear portion of guard can be quickly cleaned in position. Guard must be in closed position before mixer will operate. Bowl support interlock provides further protection. Bowl lift: Ergonomic style, hand crank operated, self-locking in top and bottom position. Finish: Metallic gray hybrid powder coat finish. Attachment Hub: Comes with front-mounted Hobart standard #12 taper attachment hub for use with Hobart #12 size attachments.

Unit to be complete with the following options and accessories:

- 30 Quart Stainless Steel Bowl.
- 30 Quart “B” Beater.
- 30 Quart “D” Wire Whip.



- 30 Quart Bowl Scraper.
- 30 Quart Ingredient Chute.

Item #: 17

Description: Work Table with Sink

Manufacturer: Advance/Tabco

Model #: VSS-3610/TA-11E

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

Specification:

Unit to be model VSS-3610 Stainless Steel Table as manufactured by Advance/Tabco and with the following features:

Features:

- Top is furnished with a 2" x 1" square die embossed NO-DRIP countertop edge with a 1/2" return on 4 sides.
- To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.
- Pre-engineered welded angle adapters insure ease of future drawer installation.
- Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

Construction:

- All TIG welded. Exposed weld areas polished to match adjacent surfaces.
- Entire top mechanically polished to a satin finish. Countertop edge polished to a MIRROR finish.
- Top is sound deadened.
- Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.
- Gussets welded to support hat sections.

Materials:

- Top: 14-gauge stainless steel type "304" series.
- Shelf: 18-gauge stainless steel.
- Legs: 1-5/8" diameter tubular, 16-gauge stainless steel type "304" series.
- 1" adjustable stainless steel bullet feet.
- Stainless steel gussets.

Unit to be complete with the following options, accessories and modifications:

- (1) One model TA-32 10" Side Splash.
- (1) One model TA-11E 24" x 24" x 12" deep sink bowl located as per plan.
- (1) One model K-1 swing spout faucet.
- (1) One model K-15 lever drain with built-in overflow.
- (1) One model TA-62C GFI Duplex Outlet & Cover Plate below countertop.
- (1) One model TA-48 12" x 12" cut-out in undershelf for plumbing.

Item #: 18

Description: Heated/Holding Cabinet

Manufacturer: F.W.E.

Model #: MTU-12D

SIS #: T037

Quantity: 1

Alternate Manufacturer: Carter-Hoffman, Cres-Cor, Metro

Specification:

Unit to be model MTU-12D Moisture-Temp Universal Cabinet as manufactured by Food Warming Equipment and with the following features:

Construction: Heliarc welded, single unit construction of type 304 stainless steel, 20-gauge polished exterior, 24-gauge stainless steel interior with easy-to-clean coved corners. Welded tubular base frame shall be 1" square, heavy gauge stainless steel tubing, with 10-gauge stainless steel reinforcing stress plates at corners.

Insulation: "Ultra-Guard" UG-26 high-density fiberglass insulation throughout; top, back, bottom, sides and door(s).

Handles: Form grip flush-in-wall hand grips recess mounted on each side of unit.

Doors and Latches: Flush mounted, stainless steel insulated doors. High temperature gasket sealed; gasket shall be cabinet mounted. Each door shall have two (2) heavy-duty edge mount die cast hinges. Door latch shall be edge mounted, full grip, and positive closing. The hinge and latch mountings are reinforced with stainless steel backing plates.

Casters: Polyurethane tire casters with Zerk grease (lubrication) fittings in a configuration of two (2) rigid, and two (2) swivel with brake. Casters shall have a reinforced yoke welded to 10-gauge caster mounting plate. The caster mounting plate shall be secured to a 10-gauge stainless steel reinforcing stress plate via welded in place stainless steel studs. The reinforcing stress plates shall be welded to the heavy gauge tubular frame of the unit.

Tray Slides: Welded rod-style tray slides are chrome plated and epoxy coated for greater durability and sanitation. Fully adjustable, removable and designed to give secure bottom tray support. Removable stainless steel uprights shall be punched on 1-1/2" (38) spacing, O.C., for easy tray adjustment, and shall easily lift off heavy-duty stainless steel brackets without the use of tools for cleaning.

Moisture-Temp System/Controls: Built in humidified holding system shall include two (2) separate long life Incoloy nickel-chromium alloy heating elements per cavity; separate, adjustable controls shall be provided for each function. One to control the interior air temperature, and one to control the interior air moisture with hydro immersion water bath. An oversized and baffled, stainless steel water reservoir shall be removable for ease of cleaning/sanitation. System shall have a Hi-Temp, self-lubricated, impedance protected fan-cooled blower motor for moist air distribution. Controls shall be up-front, recessed and eye-level for convenience and safety, and shall include a full range thermostat adjustable to actual temperature. Thermostat shall include temperature scale marked in ten degree increments (F/C) from 90° to 190°F (30° to 90°C). An operational range thermometer, adjustable moisture control (moist to crisp), 20 amp On/Off power switch, humidity cycle light, and thermostat cycling light shall also be included.

Electrical Characteristics: 3 wire grounded 10 foot extension power cord and plug, side mounted for safety. 120-Volt, single phase, 1650 watts, 13.75 amps. NEMA 5-15P Plug. Dedicated circuit.

Item #: 19

Description: Work Table  
Manufacturer: Advance/Tabco  
Model #: VSS-368  
SIS #: T037  
Quantity: 1  
Alternate Manufacturer: Eagle, Custom Fabricated

Specification:

Unit to be model VSS-368 Stainless Steel Table as manufactured by Advance/Tabco and with the following features:

Features:

- Top is furnished with a 2" x 1" square die embossed NO-DRIP countertop edge with a 1/2" return on 4 sides.
- To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.
- Pre-engineered welded angle adapters insure ease of future drawer installation.
- Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

Construction:

- All TIG welded. Exposed weld areas polished to match adjacent surfaces.
- Entire top mechanically polished to a satin finish. Countertop edge polished to a MIRROR finish.
- Top is sound deadened.
- Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.
- Gussets welded to support hat sections.

Materials:

- Top: 14-gauge stainless steel type "304" series.
- Shelf: 18-gauge stainless steel.
- Legs: 1-5/8" diameter tubular, 16-gauge stainless steel type "304" series.
- 1" adjustable stainless steel bullet feet.
- Stainless steel gussets.

Unit to be complete with the following options and accessories:

- (1) One model SHD-2020 drawer.

Item #: 20  
Description: Slicer  
Manufacturer: Hobart  
Model #: HS9  
SIS #: T037  
Quantity: 1  
Alternate Manufacturer: Bizerba, Globe

Specification:

Unit to be model HS9 Slicer as manufactured by Hobart and with the following features:

Knife: 13" CleanCut Knife: The knife is approximately 13 inches, constructed of 304L stainless steel and high performance Stellite alloy. Knife cover is retained magnetically, and is quickly removed by pulling straight back on the top cover knob. Removable Knife Option HS9: The patented knife removal tool covers the knife edge and safely removes knife from gauge plate to allow for thorough cleaning. Removable Ring Guard Cover: Fits on top of ring guard to catch food debris. When removed, reveals a 0.12" space between knife and guard for easier flossing. Ring guard is made with Zytel™ plastic and can be washed in warewasher or three compartment sink. Zero Knife Exposure: Knife edge is not exposed during cleaning or sharpening procedures. Top Mounted Borazon Stone Sharpener: Single action operation utilizing two Borazon stones to sharpen and hone in five seconds. Removable, top mounted and warewasher safe. When sharpener is removed for cleaning, knife edge is completely shielded. Borazon stones have a lifetime guarantee. Motor: Poly V-Belt Knife Drive System: Knife is driven by a Hobart Poly V belt and runs at 430 rpm for optimal performance. Four Stroke Speeds: Stroke speed can be set to 28, 38, 48 and 58 strokes per minute. 1/2 H.P. Knife Drive Motor: 1/2 H.P. permanently lubricated ball bearings. Single phase capacitor-start, induction run. Interlocks: Home Start Position: Home-start ensures carriage is in a convenient position before starting the slicer. Close to Stop: After slicing, a quick turn of the index knob to the closed position turns off the slicer. Gauge Plate Interlock: Gauge plate interlock protects knife edge when indicator is at zero. Carriage System Interlock: Carriage will not tilt away or remove if gauge plate indicator is not closed. No Volt Release: In the event of a power loss, slicer must be restarted before operation can continue. Automatic Shut Off: Knife shuts off after 30 seconds of inactivity to extend motor life and save energy. Housing and Base: Sanitary Anodized Aluminum Base: One-piece base has fewer places to harbor soil and is easier to clean. Limits holes or crevices in which food can lodge. Finish: Stainless steel top cover, anodized aluminum product tray and gauge plate. Exclusive Tilting, Removable Carriage System: Aluminum product tray tilts easily for mid-day cleaning and is removable for thorough cleaning and sanitation procedures. The carriage has 12.5" manual travel. Electroless Nickel Plated Single Slide Rod with Reservoir Wick in Transport: Transport slide rod is E-Nickel electroless plated. Slide rod bearings feature an oil reservoir/oil wick. Double-Action Indexing Cam: A solid construction index knob moves the gauge plate via a barrel cam ensuring consistent slice thickness across machine and over time. First revolution of index cam for precision slicing; second revolution for thicker slicing selection. Manual Lift Lever: Helps hold slicer in tilted position for cleaning beneath the machine. Ergonomic Style Handle: Specially shaped and positioned for ease of use during manual operation. Rear Mounted, Removable Meat Grip Arm: Rear mounted grip is high strength thermoplastic. Swings out of way when not in use. Electrical Specification: 120/60/1; 5.6 Amps. Switch: Moisture protected push button switch. Cord & Plug: 6-foot, three-wire power supply cord and plug. Plug not furnished on export models. Capacity: The carriage will take food up to 53/4" x 103/4" rectangle or 7.5" in diameter. Gauge Plate: Gauge plate is a heavy aluminum extrusion with machined grooves for smooth feeding. Adjustable to cut any thickness of slice up to 1". Warranty: All parts and service coverage for one year including knife. Lifetime guarantee on Borazon stones in the sharpening system. Shipping Weight: 142 lbs.

Item #: 21

Description: Refrigerator, 1-Section, Pass-Thru

Manufacturer: Continental

Model #: DL1R-PT-HD

SIS #: T037

Quantity: 1

Alternate Manufacturer: Traulsen, Victory

Specification:

Unit to be model DL1R-PT-HD 1-Section Pass-Thru Refrigerator with Half Doors as manufactured by Continental Refrigerator and with the following features:

Refrigeration System: A “performance rated”, air-cooled, hermetically sealed, capillary-type refrigeration system is installed on the top of each refrigerator. Plasticized fin coil and air circulation fans are contained within a concealed “plug”-type insulated housing, readily accessible on top of the cabinet and separate from the food zone to increase food storage capacity. The entire “plug” system is fully charged with environmentally safe R-134a refrigerant and mounted on a sturdy steel, rail-type base which can be easily removed if freezer conversion is desired. Refrigerators are designed to maintain 38°F-40°F (3°-5° Centigrade) while operating with an unrestricted air supply in a maximum ambient temperature of 100°F. All condensate water is evaporated by an automatic, non-electric, corrosion-resistant condensate evaporator. A strict quality-assurance team inspects all materials and components to certify that each model conforms to the most exacting standards. All models are factory performance-tested for a minimum of 16 hours prior to crating.

Insulation: All cabinet walls, top and bottom have high density, foamed-in-place, non-CFC polyurethane insulation.

Shelving: Shelves are designed for heavy-duty use with .306” diameter frame and brace members and .140” diameter fill wires spaced 3/4” apart. Shelves are welded steel and epoxy-coated for a durable, long, rust-free service life. Adjustments are in 1 inch increments and a wide door opening allows the use of a variety of optional pan and tray slide types.

Cabinet Construction: All materials are of top quality, assembled to conform with strict quality-assurance requirements. The cabinet front is constructed of heavy-gauge polished stainless steel for durability. All cabinet joints and seams are sealed vapor-tight. Case is of all metal, welded construction and internally supported and braced for a rigid unit construction. Cabinet design eliminated overlapping panels with raw edges. Cabinet body is insulated with non-CFC, foamed-in-place polyurethane foam with an average thickness of 3 inches to ensure increased energy efficiency. Full-length louvered air grille located above the doors allows equal air circulation to the condensing unit. Easily removable, low-wattage, anti-sweat door heaters concealed by a non-metallic, non-conductive, high-impact thermal breaker strip eliminate condensate build-up on the cabinet front. Automatic interior lighting is activated by an easily accessible interior switch. Cabinets are equipped with 6-inch adjustable stainless steel legs.

Door Construction: Solid hinged door shells are constructed of heavy-gauge stainless steel and are internally braced and urethane-foam-insulated for rigidity. Door corners are welded construction and polished. Replaceable snap-in door gaskets are self-adjusting, heavy-duty, magnetic type. Door handles and hinges are chrome-plated and non-corrosive. Doors are provided with built-in cylinder locks which are keyed alike. Hinges are cam action, lift-off type featuring positive safety stop at 120 degrees.

Item #: 22

Description: Sink, 3-Compartment

Manufacturer: Advance/Tabco

Model #: 94-83-60-18RL

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

## Specification:

Unit to be model 94-83-60-18RL Stainless Steel Three Compartment Sink with Two Drainboards as manufactured by Advance/Tabco and with the following features:

## Features:

- Tile edge for ease of installation.
- One piece Deep Drawn sink bowls with integral drainboards with splash.
- Featuring the single bowl unit design.
- All sink bowls have a large liberal 3" radius.
- Placement of the welded leg assembly ensures stability and furnishes direct support of the column load requirement for the entire sink unit.
- "940" series is supplied with adjustable front and rear cross brace featuring leg casting to secure left to right cross bracing.

## Construction:

- All TIG welded.
- Welded areas blended to match adjacent surfaces and to a satin finish.
- Gussets welded to a die-embossed reinforcing channel.

## Materials:

- Top: 14-gauge type 304 stainless steel with 11" high splash.
- 1-5/8" diameter tubular stainless steel legs.
- Stainless steel gussets & channels.
- Stainless steel 1" adjustable bullet feet.

Unit to be complete with the following options and accessories:

- (1) One model K-472 faucet hole revision.
- (2) Two model K-11 splash mounted faucets.
- (3) Three model K-15 lever waste with built-in overflows.

Item #: 23

Description: Shelf with Pot Rack

Manufacturer: Advance/Tabco

Model #: PS-12-96

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

## Specification:

Unit to be model PS-12-96 Stainless Steel Shelf with Pot Rack as manufactured by Advance/Tabco and with the following features:

## Features:

- A dual-purpose unit for shelf and utensil storage.
- Secured to wall by means of bolts through welded brackets. (Hardware not provided)

## Materials:

- Flat stainless steel bar is 2" x 1/4".
- Pot hooks are plated.
- Type "430" stainless steel shelf.

**Construction:**

- All welded stainless steel units are blended to a satin finish.

**Item #: 24****Description:** Shelving Unit (Pot/Pan Rack)**Manufacturer:** Cambro**Model #:** Elements Series**SIS #:** T037**Quantity:** 2**Alternate Manufacturer:** Metro**Specification:**

Each unit to be a 4-Shelf Cambro Elements Series Starter Stationary Unit with the following features: Shelf Plates only with Camguard antimicrobial. 3 Post Heights 64", 72", 84". 3 Shelf Widths 18", 21", 24". 5 Shelf Lengths 36", 42", 48", 54", 60".

Each Starter Unit shall include: 4 stationary posts with leveling feet installed pre-assembled with post connectors and wedges, 1 bag of 32 stationary traverse dovetails (16 ea. A and B), Vented shelf plates (for 4 shelves), 8 stationary traverses and instructions.

Posts: Proprietary non-corrosive composite material. Post Connectors: Glass Filled Polypropylene. Traverses: Proprietary non-corrosive composite material. Vented/Solid Shelf Plates: Reinforced polypropylene with Camguard antimicrobial. Corner Connectors: Glass Filled Polypropylene. Adjustable Foot: Glass Filled Nylon. Seismic Foot: Stainless Steel post and wide foot plate, 3 holes for bolts. (Bolts not provided) Divider Bars: Glass Filled Nylon. Wall Fastener: Stainless Steel. Dovetails: Resin Nylon Wedges: Resin Polypropylene

(1) One unit at 21" x 36" x 72" high. (Model # ESU213672V4)

(1) One unit at 21" x 42" x 72" high. (Model # ESU214272V4)

**Item #: 25****Description:** Dishtable, Clean**Manufacturer:** Fabricated**Model #:** Custom**SIS #:** T037**Quantity:** 1**Specification:**

Unit to be size and shape as shown on plan and in detail. 48" long x 30" wide x 34" high. Unit to feature 14-gauge stainless steel, type 304 18/8, and polished to a #4 satin finish. All seams to be welded, ground smooth and polished. Top shall be turned up 3" and finished with a 1-1/2" sanitary rolled edge on front and left end. All horizontal and vertical bends to be rounded to a 3/4" radius with all intersections to have coved corners. Splash to be coved up 10" high with 2" return to wall at 45 degrees with ends closed. Top to be

underbraced with stainless steel channeling and to be attached to top with studs and dome caps. Table to have stainless steel legs with stainless steel undershelf. Unit to have stainless steel gussets and stainless steel adjustable bullet feet.

Item #: 26

Description: Dishwasher with Booster Heater, Ventless

Manufacturer: Meiko

Model #: DV 80.2 WAHRS

SIS #: T037

Quantity: 2

Specification:

Unit to be model DV 80.2 WAHRS Hot Water Sanitizing Door-Type Dishwasher as manufactured by Meiko and with the following features:

Standard Features:

- ENERGY STAR Qualified.
- Capacity 61 racks per hour.
- Water consumption 0.74 gallons (2.8 liters) per rack.
- Double-wall construction keeps heat inside the machine, reducing energy consumption and heat loss into the dishroom environment.
- Variable programmed time cycles - 59, 90 and 210 seconds.
- Fully automatic - automatic fill, automatic start, and automatic reset.
- Pumped drain for both floor and wall drain applications.
- Machine shutdown activates an automatic rinse of the wash chamber to ease cleaning.
- Stainless steel non-clogging wash and rinse arms.
- Sloped ceiling is safer for the user and prevents dripping of soiled water onto sanitized ware.
- Front mounted controls with digital temperature displays.
- Hp (0.75 kW) wash pump.
- 304 and 316L stainless steel construction for corrosion resistance.

Special Features:

- Auto Safe temperature control system - Guarantees 180°F (82°C) sanitizing final rinse temperature, regardless of incoming water temperature.
- MIKE 2 electronic control system - advanced micro-computer technology for service diagnostics and end-user dishmachine settings. Includes one-touch operation, one-touch selection of three different cycle lengths, automatic temperature monitoring with digital display, and advanced service diagnostics.
- Automatic push-handle cycle start.
- Active Plus filtration system - Double filtration of wash water removes food soil, improves washing efficiency and saves detergent while easing cleaning chores.
- Soft Start wash pump - Protects dishes and glasses from chipping or breaking.
- Aqua-Stop - Automatically stops machine operation and turns off the external fill valve if an internal leak is detected.
- Built-in booster heater with power rinse pump - Guarantees constant final rinse pressure and temperature for consistent, outstanding results.



Unit to be complete with the following options and accessories:

- Waste Air Heat Recovery System – reclaims machine heat as free energy to preheat the incoming rinse water. This conserves energy and permits operation without a ventilation hood.
- Drain water tempering kit.

Item #: 27

Description: Slicer Cart

Manufacturer: Eagle

Model #: T3030SEM-ST-CAH

SIS #: T037

Quantity: 1

Alternate Manufacturer: Advance/Tabco, Custom Fabricated

Specification:

Unit to be model T3030SEM-ST-CAH Mobile Slicer Table as manufactured by Eagle Group and with the following features:

14-gauge stainless steel tabletop features box marine edge to retard spillage. Heavy gauge stainless steel construction. Stainless steel legs with 5" diameter heavy duty resilient casters. Stainless steel 5-pan slides mounted to removable angle. Welded bottom solid shelf. Unit to measure 31-1/8" W. x 27-1/8" L. x 34" H.

Item #: 28

Description: Dishtable, Soiled

Manufacturer: Fabricated

Model #: Custom

SIS #: T037

Quantity: 1

Specification:

Unit to be size and shape as shown on plan and in detail. "L" shaped. Unit to feature 14-gauge stainless steel, type 304 18/8, and polished to a #4 satin finish. All seams to be welded, ground smooth and polished. All horizontal and vertical bends to be rounded to a 3/4" radius with all intersections to have coved corners. 2'-6" wide x 2'-10" high with 3" rolled rim on front and right edge. Top shall extend through pass opening with inverted "V" edge. Edge turned down 1-1/2" and returned to wall with ends closed. Carry 10" high flat backsplash to wall behind tracks of rolling service door. Extend 10" high side splash through opening. Balance of 10" high splash to have 2" return at 45 degrees with ends closed. One 20" x 20" x 6" deep pre-rinse sink with removable stainless steel rack guides. Included with this unit shall be (1) One T&S Brass model B-133 pre-rinse spray and B-109-1 wall bracket. Table to include a minimum of six stainless steel leg assemblies with stainless steel feet and stainless steel undershelf notched and welded to legs. Make provisions for disposer control panel, disposer collar, and holes for vacuum breaker in backsplash.

Unit shall be complete with one stainless steel window frame. Sized and shape as shown on plan and in detail. Constructed of 16-gauge type 304 stainless steel and polished to a #4

satin finish. Unit to be telescoping (split) type frame construction with 2” flush return on kitchen side and 2” return at 90 degrees with ½” return to wall on cafeteria side with all ends closed.

Item #: 29

Description: Disposer

Manufacturer: Insinkerator

Model #: SS-200-7-CC-101

SIS #: T037

Quantity: 1

Alternate Manufacturer: Salvajor

Specification:

Product Overview:

- Corrosion resistant stainless steel grind chamber.
- 3/4" (19.1 mm) rubber mounting above grinding chamber, enclosed in chrome plated covers for sanitation and appearance.
- 2 H.P. induction motor with built-in thermal overload protection, 1725 RPM, totally enclosed to provide protection against outside moisture with controlled power air flow to cool motor—provides better efficiency, longer life.
- Cast nickel chrome alloy stationary and rotating shredding elements for long life and corrosion resistance, designed for reverse action grinding.
- Double-tapered Timken roller bearings provide a shock absorbing cushion.
- Triple lip seal protects motor from water damage and secondary spring-loaded oil seal provides double protection against water and loss of grease.
- Stainless steel and chrome plated finish—paint-free for lasting sanitation.

Unit to be complete with:

- Base disposer: model SS-200
- Mounting Gasket.
- Support Legs.
- Mounting Assembly: #7 Collar Adaptor for welding into sink.
- Electrical Control: CC-101 Auto-Reversing Control Center.
- Syphon breaker: model 13412, (chrome, 45° fittings)
- Solenoid Valve.
- Flow Control Valve.
- Voltage: 208-Volt, 3-Phase, 2-HP, 3.3-Amps

Item #: 30

Description: Tray/Silverware Dispenser

Manufacturer: LTI

Model #: TD-1014

SIS #: T037

Quantity: 1

Alternate Manufacturer: Delfield, Duke, Randell

Specification:

Unit to be model TD-1014 Rack Dispenser for Trays, Dishes or Silverware as manufactured by LTI and with the following features:

Top: Top to be fabricated from a minimum of 14 gauge stainless steel with square turndown on all sides and corners fully welded, ground and polished. Top to have #4 satin finish and all edges having #7 hi-lite finish.

Body and Frame: The frame to be 14-gauge stainless steel construction. Full perimeter top and bottom frame fully welded, ground and polished to vertical corner uprights making body frame one integral unit. Non-marking corner bumpers secured to bottom frame. Body panels to be fiberglass reinforced polyester (F.R.P.) with smooth exterior surface. All fiberglass to be flame retardant per specification ASTM E-162 having a flame spread of 25 or less.

Dispensers: The top opening shall contain a stainless steel self-leveling dispenser. Dispensing mechanism shall be constructed with automatic self-leveling elevators, enclosed in a stainless steel housing. The elevator mechanisms shall be field adjustable without the use of tools and be connected to a removable heavy gauge stainless steel carrier. Casters: 4" diameter, ball bearing, swivel type casters to be non-marking and with brakes on all wheels.

- Verify tray size with owner before ordering.

Item #: 31

Description: Serving Counter, Hot Food

Manufacturer: LTI

Model #: EF4-CPA-66-F

SIS #: T037

Quantity: 1

Alternate Manufacturer: Delfield, Duke, Randell

Specification:

Unit to be model EF4-CPA-66-F Hot Food Table as manufactured by LTI and with the following features:

Top: Top to be 30" wide and fabricated from a minimum of 14-gauge stainless steel with square turndown on all sides and corners fully welded, ground and polished. Top to have #4 satin finish and with all edges having a #7 hi-lite finish.

Hot Food Units: Provide with dry/moist electric hot food wells to be bottom mounted and have a 12" x 20" die stamped opening with ¼ raised beaded edge. Interior pan to be 304 stainless steel, deep drawn with coved corners and fully insulated with fiberglass insulation. Each hot food well to use a 500 watt at 208V heat source, or 661 watt at 120-240V heat source, with solid state digital controls for maximum energy efficiency. All switches and controls to be fully accessible. All wells are wired to a circuit breaker for current overload protection.

Body (F): Body to be seamless molded fiberglass (F.R.P.) with smooth exterior surfaces and rounded corners. To be constructed by a hand lay-up process with four layers of 1.5 oz. continuous strand fiberglass mat, plus a 24 oz. layer of woven roving on the bottom for added strength. Fiberglass to be flame retardant per specification ASTM E-162 having a flame spread of 25% or less. Body interior to be reinforced at each end with 4" wide, 12 gauge galvanized channels welded to form integral U frame for maximum stress relief.

Castors: 5" diameter, ball bearing, swivel type casters to be non-marking and with brakes on all wheels. Casters to be mounted through two 12 gauge channels for extra rigidity.

Unit to be complete with the following options and accessories:

- (AA) Line-Up Locks
- (Z) With STD. CPVC Manifold with Drain.
- (D) 8" Wide stainless steel shelf.
- (E) 8" Wide richlite cutting board mounted to stainless steel shelf.
- (GCG) Sloped Front Protector with glass clips and glass top shelf.
- (V) 46" stainless steel insert storage shelf.

Item #: 32

Description: Serving Counter, Flat Top

Manufacturer: LTI

Model #: 36-ST

SIS #: T037

Quantity: 2

Alternate Manufacturer: Delfield, Duke, Randell

Specification:

Unit to be model 36-ST Solid Top Food Table as manufactured by LTI and with the following features:

Top: Top to be 30" wide and fabricated from a minimum of 14-gauge stainless steel with square turndown on all sides and corners fully welded, ground and polished. Top to have #4 satin finish and with all edges having a #7 hi-lite finish.

Body (F): Body to be seamless molded fiberglass (F.R.P.) with smooth exterior surfaces and rounded corners. To be constructed by a hand lay-up process with four layers of 1.5 oz. continuous strand fiberglass mat, plus a 24 oz. layer of woven roving on the bottom for added strength. Fiberglass to be flame retardant per specification ASTM E-162 having a flame spread of 25% or less. Body interior to be reinforced at each end with 4" wide, 12 gauge galvanized channels welded to form integral U frame for maximum stress relief.

Casters: 5" diameter, ball bearing, swivel type casters to be non-marking and with brakes on all wheels. Casters to be mounted through two 12 gauge channels for extra rigidity.

Unit to be complete with the following options and accessories:

- (AA) Line-Up Locks
- (D) 8" Wide stainless steel shelf. (One unit only)
- (E) 8" Wide richlite cutting board mounted to stainless steel shelf. (One unit only)
- (V) 28" stainless steel insert storage shelf.

Item #: 33

Description: Serving Counter, Cold Food

Manufacturer: LTI

Model #: 66-CFMA

SIS #: T037

Quantity: 2

Alternate Manufacturer: Delfield, Duke, Randell

Specification:

Unit to be model 66-CFMA Temp-est Aire Cold Food Table as manufactured by LTI and with the following features:

Top: Top to be 30" wide and fabricated from a minimum of 14-gauge stainless steel with square turndown on all sides and corners fully welded, ground and polished. Top to have #4 satin finish and with all edges having a #7 hi-lite finish.

Temp-est Aire® Cold Pans: Cold pans to be 18-gauge stainless steel fully welded construction with ¼" coved corners. The cold pan shall be pitched to a 1" drain, which is extended to a valve below the base. All cold pans shall be furnished with urethane insulation on bottom and all four sides of pan. The pan shall be fully separated from the counter top by a full perimeter breaker strip. Cold pans are to allow for a full steam table pan 6" deep. Temp-est Aire cold pan shall be 9" deep and include a patented forced air refrigeration system. Cold pan includes low velocity fans and an advanced cold wall design operating on R-507 refrigerant. Cold pan will meet or exceed NSF7 standards while allowing food pans to remain flush to the counter top.

Body (F): Body to be seamless molded fiberglass (F.R.P.) with smooth exterior surfaces and rounded corners. To be constructed by a hand lay-up process with four layers of 1.5 oz. continuous strand fiberglass mat, plus a 24 oz. layer of woven roving on the bottom for added strength. Fiberglass to be flame retardant per specification ASTM E-162 having a flame spread of 25% or less. Body interior to be reinforced at each end with 4" wide, 12 gauge galvanized channels welded to form integral U frame for maximum stress relief.

Casters: 5" diameter, ball bearing, swivel type casters to be non-marking and with brakes on all wheels. Casters to be mounted through two 12 gauge channels for extra rigidity.

Unit to be complete with the following options and accessories:

- (AA) Line-Up Locks
- (CCB) Curved tempered glass buffet shield.
- (D) 8" Wide stainless steel shelf. (One unit only)
- (E) 8" Wide richlite cutting board mounted to stainless steel shelf. (One unit only)
- (V) 36" stainless steel insert storage shelf.

Item #: 34

Description: Self-Serve Merchandiser

Manufacturer: Federal

Model #: RSSM-478SC

SIS #: T037

Quantity: 1

Specification:

Unit to be model RSSM-478SC Refrigerated Self-Serve High Profile Merchandiser as manufactured by Federal Industries and with the following features:

- Adjustable black metal shelves with price tag molding. Shelves can be flat or slanted. The 60" case has two tiers of shelves, the 78" case has four tiers.
- Top mounted octron shielded light. Shelf lights optional.
- Choice of six standard laminates on exterior. Other color laminates are optional. Black metal front grill and galvanized steel back.
- Silver trim, gold, and black optional.
- Stainless steel display deck, glass and black interior ends, black interior back panel.

- Energy saving night curtain.
- Solid state timer provides automatic defrost.
- Condensate evaporator provided for a totally self-contained system.
- Insulated with high-density urethane foam.
- Continuous line-ups are available for remote applications.
- Refrigeration controls maintain 40°F. Note: Case temperature will vary if the air curtain is disrupted.
- The rear of the unit needs to be 6" from a wall.
- Thermometer.
- UL Safety and UL Sanitation Listed.

Unit to be complete with the following options and accessories:

- Special Laminate. (color to be selected by architect)
- Roll-up Security Cover.
- Hinged rear access doors.

Item #: 35

Description: Serving Counter, Cashier Stand

Manufacturer: LTI

Model #: 28-CSS

SIS #: T037

Quantity: 1

Alternate Manufacturer: Delfield, Duke, Randell

Specification:

Unit to be model 28-CSS Cashier Station as manufactured by LTI and with the following features:

Top: Top to be 30" wide and fabricated from a minimum of 14-gauge stainless steel with square turndown on all sides and corners fully welded, ground and polished. Top to have #4 satin finish and with all edges having a #7 hi-lite finish.

Body (F): Body to be seamless molded fiberglass (F.R.P.) with smooth exterior surfaces and rounded corners. To be constructed by a hand lay-up process with four layers of 1.5 oz. continuous strand fiberglass mat, plus a 24 oz. layer of woven roving on the bottom for added strength. Fiberglass to be flame retardant per specification ASTM E-162 having a flame spread of 25% or less. Body interior to be reinforced at each end with 4" wide, 12 gauge galvanized channels welded to form integral U frame for maximum stress relief. Cashier liner. Cashier tubular foot rest. Cord grommet for cashier cord.

Casters: 5" diameter, ball bearing, swivel type casters to be non-marking and with brakes on all wheels. Casters to be mounted through two 12 gauge channels for extra rigidity.

Unit to be complete with the following options and accessories:

- (AA) Line-Up Locks
- (HH) Cashier Drawer with Lock.
- (DD) Electrical Outlet in Cabinet with Wiring – Convenience Outlet.

Item #: 36

Description: Trayslide

Manufacturer: Fabricated  
Model #: Custom  
SIS #: T037  
Quantity: 1

Specification:

Unit to be size and shape as shown on plan and in detail. Unit to be approximately 19'-6" long by 11 1/2" deep, turned down 2" on front and rear with 1/2" return to walls at 90 degrees. Trayslide to be constructed of 14-gauge stainless steel with stainless steel reinforcement and brackets for attaching to wall. Trayslide surface to be mounted at 34"-AFF and exposed ends to be capped. Trayslide to have (4) four raised "V" tray ribs 1/2" high. Unit to have a 2" overhang on kitchen and cafeteria sides.

## **Culinary Arts/Baking Kitchen**

Item #: 101  
Description: Shelving Unit (Dry Storage)  
Manufacturer: Cambro  
Model #: Elements Series  
SIS #: T037  
Quantity: 9  
Alternate Manufacturer: Metro

Specification:

Each unit to be a 4-Shelf Cambro Elements Series Starter Stationary Unit with the following features: Shelf Plates only with Camguard antimicrobial. 3 Post Heights 64", 72", 84". 3 Shelf Widths 18", 21", 24". 5 Shelf Lengths 36", 42", 48", 54", 60".

Each Starter Unit shall include: 4 stationary posts with leveling feet installed pre-assembled with post connectors and wedges, 1 bag of 32 stationary traverse dovetails (16 ea. A and B), Vented shelf plates (for 4 shelves), 8 stationary traverses and instructions.

Posts: Proprietary non-corrosive composite material. Post Connectors: Glass Filled Polypropylene. Traverses: Proprietary non-corrosive composite material. Vented/Solid Shelf Plates: Reinforced polypropylene with Camguard antimicrobial. Corner Connectors: Glass Filled Polypropylene. Adjustable Foot: Glass Filled Nylon. Seismic Foot: Stainless Steel post and wide foot plate, 3 holes for bolts. (Bolts not provided) Divider Bars: Glass Filled Nylon. Wall Fastener: Stainless Steel. Dovetails: Resin Nylon Wedges: Resin Polypropylene

- (3) Three units at 21" x 48" x 72" high. (Model # ESU214872V4)
- (6) Six units at 21" x 60" x 72" high. (Model # ESU216072V4)

Item #: 102  
Description: Walk-In Cooler

Manufacturer: Bally

Model #: Custom

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

Sectional walk-in refrigerators and freezers complete with doors shall be manufactured by Bally Refrigerated Boxes, Inc. Unit to be complete as shown on plans and in detail. Overall size of walk-in shall be 20'-2-1/2" by 9'-8" by 8'-6" high with floor.

Foam core of panels shall be Underwriters Laboratories-listed as having flame spread of 25 or lower and smoke generation of 450 or lower when tested in accordance with ASTM E-84-76. Panel shall be approved by Factory Mutual as a Class I building type. They shall be foamed using HCF 245A expanding agent and shall have a zero ozone depletion factor. The use of any expanding agent using R-22 and/or Pentane are specifically excluded.

All work and materials shall be in full accordance with local and/or state ordinances, and with any other prevailing rules and regulations. Bally Refrigerated Boxes, Inc. is not responsible for furnishing items required by regulations, unless specified or shown on the drawings or contained in the specifications.

Panels shall consist of interior and exterior metal skins precisely formed with steel dies and roll-form equipment and thoroughly checked with gauges for accuracy. The metal skins shall be placed into heated molds and liquid urethane injected between them.. Urethane shall be foamed-in-place (poured, not frothed) and, when completely heat cured, shall bind tenaciously to the metal skins to form an insulated panel. Panels shall contain 100 percent urethane insulation and have no wood or structural members between the skins. To insure tight joints, panel edges must have foamed-in-place tongues and grooves with a flexible vinyl gasket on the interior and exterior of all tongue edges. Gaskets shall be resistant to damage from oil, fats, water and detergents and must be NSF-approved. Panel thickness shall be 4 inches.

Finishes:

- Interior Floor: Galvanized (16 GA)
- Interior Walls: Embossed White (190 Series)
- Interior Ceiling: Embossed White (190 Series)
- Exposed Exterior Walls: Embossed White (190 Series)
- Exterior Floor: Embossed White (190 Series)
- Exterior Ceiling: Walls: Embossed White (190 Series)

All panels except corner panels shall be made in 23" and 46" widths, fully interchangeable for fast, easy assembly. Panels 11-1/2", 17-1/4" or 34-1/2" wide are to be furnished only if required to fit the allocated space. To assure perfect alignment and maximum strength, corner panels shall employ a right-angle configuration with exterior horizontal dimensions of 12" on each side.

Panels shall be equipped with Bally Speed-lok diaphragmatic joining devices. The distance between locks shall not exceed 46". Each device shall consist of a cam-action, hooked locking arm placed in one panel, and a steel rod positioned in the adjoining panel, so that when the arm is rotated, the hook engages the rod and draws the panels tightly together with cam action. Arms and rods shall be housed in individual steel pockets. Pockets on one side of the panel shall be connected to pockets on the other side in width, by use of 2"-wide



metal straps set into and completely surrounded by the insulation. When panels are joined together, these straps shall form lock-to-lock connections for extra strength.

Floor Construction: Bally furnishes floor panels only. All construction and preparation for Bally floor panels must be provided by others. Floor panel construction shall be similar to that described in sections 7 and 8 above, but with 16-gauge smooth galvanized interior skin; thickness of floor panel shall be 4" and is NSF-approved. Floor panels shall be placed in a rough depression in floor 6" below finished floor of kitchen and leveled. A 2" thick finished floor shall be installed on top of walk-in floor panel as shown in detail. Setting bed and finished floor finish to be supplied and installed by others. Door shall be cut to accept tile and grout under door threshold.

Hinged Entrance Door Panels: Each door shall be 34" wide x 78" high. The number of doors, location and direction of swing is specified on the plans. Doors are in-fitting and flush-mounted. Construction shall be as specified in section 7 above. Magnetic core, thermoplastic gaskets installed on the top edge and both sides of the door shall keep the door in a closed position, forming a tight seal; a flexible, dual-blade wiper gasket shall be installed at the bottom of the door. NSF-approved gaskets shall be replaceable and resistant to damage from oil, fats, water and detergent. A heavy U-channel structural steel frame around the perimeter of the door opening shall prevent racking or twisting; steel frame is to be reinforced for hardware attachment. Anti-condensate heater wire shall be concealed behind the metal edge of the door jambs. the door panel shall also include a vapor-proof interior lamp; junction box for 120-Volt, 60 cycle, 1 phase, a.c. service (15 amp maximum); 2"-dia. flush-face dial thermometer. Hardware shall be two spring-loaded, self-closing hinges; cylinder latch with provision for padlocking and safety release mechanism; door closer. All with satin aluminum finish.

#### Options and Accessories:

- Walk-in doors shall be modified to accept a tile and grout floor under threshold.
- Floor to be installed on rough depression in floor 6" below finished floor of kitchen and leveled. A 2" thick finished floor shall be installed on top of walk-in floor panel as shown in detail. Setting bed and finished floor to be supplied and installed by others.
- Each door shall be complete with a 14" x 24" three pane heated observation window.
- Each door to be complete with strip curtains.
- Trim pieces to seal off box from walls and ceiling.
- Super door feature: Each door shall be complete with 3 heavy duty spring mounted hinges and aluminum diamond plate mounted on the interior and exterior of each door and frame 32" high.
- Alarm System: Each compartment shall be supplied with Audio-Visual Alarm with digital temperature readout Hi/Low set point with dry contact. Modularm model 75LC Multi-Monitor.
- Bally standard pressure relief port. (Freezer Compartment)
- (2) Two Kason LED 1810 48" light with strips. (1 per compartment)

Mechanical Refrigeration System: Bally shall provide pre-assembled remote quiet line refrigeration equipment which shall include all necessary components factory installed on both evaporator and condensing units. All components shall be pre-wired, so that job site work is limited to making electrical connection to each condensing unit and each

evaporator, interconnecting wiring between assemblies is specifically excluded. Contractor shall be responsible for all refrigeration tubing connections between the assemblies. All necessary electrical equipment and refrigeration tubing shall be furnished by the electrical and refrigeration contractors. Contractor shall supply pre-assembled remote systems which include mounted expansion valve and liquid solenoid. All coils to be constructed of heavy gauge aluminum with easy access/quick disconnect fan, motor and mount assemblies. All evaporators shall be equipped with Bally SmartVap Controller and shall include lockable disconnect switch mounted on evaporator. The SmartVap shall control all defrost and thermostat operations. The controller will allow for tighter control of the temperature within the walk-in. Fan guard shall be constructed of high density polyethylene with built-in throw boosters. Electric defrost coil shall include corrosion proof stainless steel heater elements. Easy access to heaters (mounted on face or bottom of coil not requiring end clearance). Condensing units shall be air-cooled, semi-hermetic, outdoor units with the following features. Weatherproof electric control panel with compressor contactor, on/off switch and fused control circuit. Discharge vibration eliminator. Fan guard. Spring mounted accessible semi-hermetic compressor. Adjustable dual pressure control. Oil failure control on all applicable models. Large receiver with fusible plug and valves. Copper tubing secured with Hydrosorb, Crush-a-Clamp. Liquid line filter drier (sweat connection), sight glass, shut-off valve. Removable hood. Crankcase heater. Energy efficient PSC condenser fan motors. Fan cycle control on two fan models over 2-HP. Head pressure control valve (adjustable type on low temp, fixed type on med or high temp). Suction filter and vibration eliminator, 2-HP and larger.

Cooler:	Compressor:	BQHA 009 E6 HS2AB
	Evaporator Coil:	BLP 209MA-SV-S1BEC
Freezer:	Compressor:	BQZA 025 L6 HT3AF
	Evaporator Coil:	BLP 209LE-SV-S2BEC

Refrigerant shall be R404-A on both coolers and freezers.

Each refrigeration system to be complete with the following options:

- Heated and insulated receiver. (Below 10 degrees)
- Wind Guard.

Piping: Furnish and install the interconnecting piping between the condensing unit and the respective unit coolers. Piping shall be installed in a neat and workmanlike manner with adjustable hangers spaced at no more than six (6) foot intervals on horizontal runs; and six (6) foot intervals on vertical runs.

Line sizes shall be in accordance with Copeland Handbook standards and best refrigeration practice, to assure: Proper feed to evaporator, Avoid excessive pressure drop, Prevent excessive amounts of lubricating oils from being trapped in any part of the system, Protect the compressor from loss of lubrication at all times, Prevent liquid refrigerant from entering the compressor during operating or idle time, To maintain a clean and dry system.

Refrigeration Piping shall be type "L" ACR grade, hard-drawn seamless copper tubing, Wrought type copper fittings, Silver-bearing soldered joints.

Condensate Drain: Furnish and install condensate drain piping from the unit cooler to open drain. Piping shall consist of: 7/8" type "L" copper tubing supported 36" on center maximum, in such a way that there will be 1" clearance between the wall and the tubing. Provide a union or slip fitting at the connection to the evaporator drain pan to allow easy disassembly for service and cleaning. drain piping shall be "P-Trapped" and pitched at least 1" per foot thru the wall of the refrigerated area and discharged with-in 2" of a floor drain.

Freezer drain line shall be wrapped with heat tape and insulated to prevent condensate freezing.

Piping Insulation: Suction line shall be covered with 1/2" thick Armaflex insulation, the insulation shall be applied to these lines in accordance with manufacturer's recommendations and, as they are being installed so that insulation will not be split. All joints shall be completely sealed with overlapping, cemented material to prevent the formation of frost on the lines. Penetrations shall be sealed with non-hardening caulking compound. The exposed ends of the penetration must be trimmed.

Refrigerant Testing: each system shall be triple-evacuated prior to charging. Fifteen hundred (1500) and Five Hundred (500) microns of vacuum shall be drawn successively and broken with dry refrigerant. After the third evacuation, the system shall be charged.

Guarantee: The equipment shall be guaranteed to maintain the specified temperatures. All mechanical refrigeration equipment shall be mechanically guaranteed for a period of one (1) year after date of acceptance of owner. The emergency service shall be provided free of charge, whenever necessary on a 24 hour, seven day-per-week basis. Any leaks that occur during the first year of operation after acceptance by the owner, shall be repaired and the necessary refrigerant added at no expense to the owner. The year service shall be provided by the installing company and under no circumstances will the service be sublet to another refrigeration contractor. The name of the installer/service agency for the guarantee period shall be located in a highly visible place on the condensing unit. The complete refrigeration package shall be provided with a (5) year parts warranty. This includes both the condensing unit and evaporator coil in their entirety as supplied by Bally.

Warranties: Bally shall warrant that any part of the structure it supplies (except the refrigeration system and its related accessories) is free from defects in materials or workmanship under normal use and service. The insulated panel portion of the structure is warranted free of defects under normal use and service for a period of ten (10) years from date of installation (but in no event shall the warranty be in force for more than ten (10) years and six (6) months from the date the product was first shipped by Bally). Panel surface condition is warranted free from defects under normal use and service for one year from installation, provided the panel is stored and installed according to Bally's instructions. Mechanical (including hardware, gaskets, Speed-lok assemblies, aluminum weather roofs) and electrical components, except refrigeration systems (which are covered by a separate warranty) are warranted to be free from defects under normal use and service for one year from date of installation. (In no case shall this portion of the warranty be in force for more than one year and six months from date the product was first shipped from Bally.) The warranty shall not include any labor charges for replacement or repair of defective parts or refrigeration. Full warranty information is to be provided with the walk-in.

Item #: 103

Description: Evaporator Coil, Cooler

Manufacturer: Bally

Model #: BLP 209MA-SV-S1BEC

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 102.

Item #: 104

Description: Compressor, Cooler

Manufacturer: Bally

Model #: BQHA 009 E6 HS2AB

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 102.

Item #: 105

Description: Walk-In Freezer

Manufacturer: Bally

Model #: Custom

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 102.

Item #: 106

Description: Evaporator Coil, Freezer

Manufacturer: Bally

Model #: BLP 209LE-SV-S2BEC

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 102.

Item #: 107

Description: Compressor, Freezer

Manufacturer: Bally

Model #: BQZA 025 L6 HT3AF

SIS #: T037

Quantity: 1

Alternate Manufacturer: American Panel, Kolpak, Thermo-Kool

Specification:

As specified under Item # 102.

Item #: 108

Description: Shelving Unit (Cooler/Freezer)

Manufacturer: Cambro

Model #: Elements Series

SIS #: T037

Quantity: 9

Alternate Manufacturer: Metro

Specification:

Each unit to be a 4-Shelf Cambro Elements Series Starter Stationary Unit with the following features: Shelf Plates only with Camguard antimicrobial. 3 Post Heights 64", 72", 84". 3 Shelf Widths 18", 21", 24". 5 Shelf Lengths 36", 42", 48", 54", 60".

Each Starter Unit shall include: 4 stationary posts with leveling feet installed pre-assembled with post connectors and wedges, 1 bag of 32 stationary traverse dovetails (16 ea. A and B), Vented shelf plates (for 4 shelves), 8 stationary traverses and instructions.

Posts: Proprietary non-corrosive composite material. Post Connectors: Glass Filled Polypropylene. Traverses: Proprietary non-corrosive composite material. Vented/Solid Shelf Plates: Reinforced polypropylene with Camguard antimicrobial. Corner Connectors: Glass Filled Polypropylene. Adjustable Foot: Glass Filled Nylon. Seismic Foot: Stainless Steel post and wide foot plate, 3 holes for bolts. (Bolts not provided) Divider Bars: Glass Filled Nylon. Wall Fastener: Stainless Steel. Dovetails: Resin Nylon Wedges: Resin Polypropylene

(2) Two units at 21" x 48" x 72" high. (Model # ESU214872V4)

(4) Four units at 21" x 54" x 72" high. (Model # ESU215472V4)

(3) Three units at 21" x 60" x 72" high. (Model # ESU216072V4)

Item #: 109

Description: Spare Number

Manufacturer: None

Model #: None

SIS #: T037

Quantity: 0

Specification:

Item #: 110

Description: Hand Sink

Manufacturer: Advance/Tabco

Model #: 7-PS-90

SIS #: T037

Quantity: 5

Alternate Manufacturer:

**Specification:**

Unit to be model 7-PS-90 Stainless Steel Hand Sink, Pedestal Base as manufactured by Advance/Tabco and with the following options:

Features: One piece Deep Drawn sink bowl design. Sink bowl is 10" x 14" x 5". All sink bowls have a large liberal radii with a minimum dimension of 2" and are rectangular in design for increased capacity. Keyhole wall mount bracket. Stainless steel basket drain 1-1/2" IPS. Flush-to-wall unit. "Hands Free" splash mounted gooseneck faucet furnished with aerator. Foot Pedal Valve for water operation. Easy removable panel to access hidden plumbing.

Construction: All TIG welded. Welded areas blended to match adjacent surfaces and to a satin finish. Die formed Countertop Edge with a No-Drip offset. One sheet of stainless steel - No Seams.

Material: Heavy gauge type 304 series stainless steel. Wall mounting bracket is galvanized and of offset design. All fittings are brass / chrome plated unless otherwise indicated.

Mechanical: Faucet supply is 1/2" IPS male thread hot and cold. Single pedal mixing valve with brass & rough chrome plated with built in check valve. Front operated temperature adjustment. (Contractor on site must connect faucet to foot pedal operated valves.)

Item #: 111

Description: Slicer Cart

Manufacturer: Eagle

Model #: T3030SEM-ST-CAH

SIS #: T037

Quantity: 2

Alternate Manufacturer: Advance/Tabco, Custom Fabricated

**Specification:**

Unit to be model T3030SEM-ST-CAH Mobile Slicer Table as manufactured by Eagle Group and with the following features:

14-gauge stainless steel tabletop features box marine edge to retard spillage. Heavy gauge stainless steel construction. Stainless steel legs with 5" diameter heavy duty resilient casters. Stainless steel 5-pan slides mounted to removable angle. Welded bottom solid shelf. Unit to measure 31-1/8" W. x 27-1/8" L. x 34" H.

Item #: 112

Description: Work Table

Manufacturer: Advance/Tabco

Model #: VSS-308

SIS #: T037

Quantity: 4

Alternate Manufacturer: Eagle, Custom Fabricated

**Specification:**

Unit to be model VSS-308 Stainless Steel Table as manufactured by Advance/Tabco and with the following features:

Features:

- Top is furnished with a 2" x 1" square die embossed NO-DRIP countertop edge with a 1/2" return on 4 sides.
- To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.
- Pre-engineered welded angle adapters insure ease of future drawer installation.
- Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

Construction:

- All TIG welded. Exposed weld areas polished to match adjacent surfaces.
- Entire top mechanically polished to a satin finish. Countertop edge polished to a MIRROR finish.
- Top is sound deadened.
- Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.
- Gussets welded to support hat sections.

Materials:

- Top: 14-gauge stainless steel type "304" series.
- Shelf: 18-gauge stainless steel.
- Legs: 1-5/8" diameter tubular, 16-gauge stainless steel type "304" series.
- 1" adjustable stainless steel bullet feet.
- Stainless steel gussets.

Each unit to be complete with the following options and accessories:

- (1) One model SHD-2020 drawer.

Item #: 113

Description: Mop Sink Cabinet

Manufacturer: Advance/Tabco

Model #: 9-OPC-84DL

SIS #: T037

Quantity: 1

Alternate Manufacturer: IMC Teddy, Eagle

Specification:

Unit to be model 9-OPC-84DL Double Width Mop Sink Cabinet as manufactured by Advance/Tabco and with the following features:

Features:

- Double Width Cabinet
- 16" x 20" x 12" Sink Bowl - (drain included)
- Opening for mop bucket to roll in Ventilation Slots
- Hinged Double Doors
- 4 Fixed Intermediate Shelves (3 in storage side, 1 above sink)
- 2 Mop Holders (1 on either side - above mop sink)

Construction:

- All TIG welded.
- Welded areas blended to match adjacent surfaces and to a satin finish.

## Materials:

- 16 gauge type “304” Series Sink Bowl
- 18 gauge type “304” Series Sink Bowl Apron
- 18 gauge type “430” Series Stainless Steel Cabinet

## Unit to be complete with the following options and accessories:

- TA-46 Door Lock
- K-94-BACK Add 430 Stainless Steel Back Panel
- K-240 Service Faucet

Item #: 114

Description: Range, 6-Burner

Manufacturer: Garland

Model #: G36-6R

SIS #: T037

Quantity: 1

## Specification:

Unit to be model G36-6R 36” Gas Restaurant Range as manufactured by Garland and with the following features:

Gas restaurant series range with large capacity (standard) oven. 35-7/16" wide, 27" deep work top surfaces. Stainless steel front, sides and 5" wide front rail. 6" legs with adjustable feet. Six Starfire-Pro 2 piece, 33,000 Btuh/ 9.67 kW gas, cast open burners set in split cast iron ergonomic grates. One piece oven with porcelain interior and heavy duty, "keep cool" door handle. Heavy cast iron "H" oven burner rated 38,000 Btuh/11.13 kW gas Oven controlled by even bake, fast recovery snap action modulating oven thermostat.

## Unit to be complete with the following options and accessories:

- (1) One set of (4) four 6” leveling swivel casters with front locking.
- (1) One Dormont model 1675KITCFS48PS, 48” long 3/4” flexible gas hose with quick disconnect, restraining device and Posi-Set.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

Item #: 115

Description: Range, 6-Burner

Manufacturer: Garland

Model #: G36-6R

SIS #: T037

Quantity: 1

## Specification:



Unit to be model G36-6R 36" Gas Restaurant Range as manufactured by Garland and with the following features:

Gas restaurant series range with large capacity (standard) oven. 35-7/16" wide, 27" deep work top surfaces. Stainless steel front, sides and 5" wide front rail. 6" legs with adjustable feet. Six Starfire-Pro 2 piece, 33,000 Btuh/ 9.67 kW gas, cast open burners set in split cast iron ergonomic grates. One piece oven with porcelain interior and heavy duty, "keep cool" door handle. Heavy cast iron "H" oven burner rated 38,000 Btuh/11.13 kW gas Oven controlled by even bake, fast recovery snap action modulating oven thermostat.

Unit to be complete with the following options and accessories:

- (1) One set of (4) four 6" leveling swivel casters with front locking.
- (1) One Dormont model 1675KITCFS48PS, 48" long 3/4" flexible gas hose with quick disconnect, restraining device and Posi-Set.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

Item #: 116

Description: Convection Oven, Double

Manufacturer: Blodgett

Model #: DFG-100-ES-Double

SIS #: T037

Quantity: 1

Alternate Manufacturer: Garland, Southbend, Vulcan

Specification:

Unit to be model DFG-100-ES-Double Full-Size Convection Oven as manufactured by Blodgett and with the following features:

Exterior Construction:

- Full angle-iron frame
- Stainless steel front, top, and sides
- Dual pane thermal glass windows encased in stainless steel door frames
- Powder coated door handle with simultaneous door operation
- Triple-mounted pressure lock door design with turnbuckle assembly
- Ball bearing slide out front control panel for easy cleaning
- 1" solid block plus 1" mineral fiber insulation for a total of 2" of insulation

Interior Construction:

- Double-sided porcelainized baking compartment liner (16 gauge)
- Stainless steel combustion chamber
- Single inlet blower wheel
- Five chrome-plated racks, eleven rack positions with a minimum of 1-5/8" (41mm) spacing
- Removeable crumb trays
- Interior halogen lights

Operation:

- Direct fired gas system
- Electronic spark ignition control system
- Removable inshot burners
- Internal pressure regulator
- Manual gas service cut-off switch located on the front of the control panel
- Solid state thermostat with temperature control range of 200°F (93°C) to 500°F (260°C)
- Two speed fan motor (single speed in CE model)
- 3/4 horsepower blower motor with automatic thermal overload protection
- Control area cooling fan

Standard Features:

- SSD - Solid state digital control with LED display, Cook & Hold and Pulse Plus®
- 25" (635mm) adjustable stainless steel legs (for single units)
- 6" (152mm) adjustable stainless steel legs (for double sections)
- Three year parts and two-year labor warranty
- Five-year limited oven door warranty\*

Unit to be complete with the following options and accessories:

- (1) One set of 6" casters.
- (1) One gas manifold for double sections.
- (1) One Dormont model 1675KITCFS48PS, 48" long 3/4" flexible gas hose with quick disconnect, restraining device and Posi-Set.

Unit to have factory authorized start-up, which shall include but not limited to calibration, lighting of pilots, start-up and testing. Start-up shall be scheduled and coordinated with job site mechanical and electrical contractors so that issues can be resolved at time of start-up. Start-up should only be scheduled after all mechanical systems to the foodservice equipment have been cleaned, tested, and confirmed operational.

Item #: 117

Description: Work Table

Manufacturer: Advance/Tabco

Model #: VSS-308

SIS #: T037

Quantity: 4

Alternate Manufacturer: Eagle, Custom Fabricated

Specification:

Unit to be model VSS-308 Stainless Steel Table as manufactured by Advance/Tabco and with the following features:

Features:

- Top is furnished with a 2" x 1" square die embossed NO-DRIP countertop edge with a 1/2" return on 4 sides.
- To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.
- Pre-engineered welded angle adapters insure ease of future drawer installation.

- Aluminum die cast “leg-to-shelf” clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

**Construction:**

- All TIG welded. Exposed weld areas polished to match adjacent surfaces.
- Entire top mechanically polished to a satin finish. Countertop edge polished to a MIRROR finish.
- Top is sound deadened.
- Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.
- Gussets welded to support hat sections.

**Materials:**

- Top: 14-gauge stainless steel type “304” series.
- Shelf: 18-gauge stainless steel.
- Legs: 1-5/8” diameter tubular, 16-gauge stainless steel type “304” series.
- 1” adjustable stainless steel bullet feet.
- Stainless steel gussets.

Each unit to be complete with the following options and accessories:

- (1) One model SHD-2020 drawer.

Item #: 118

Description: Work Table with Sink

Manufacturer: Advance/Tabco

Model #: VKS-3012/TA-11D2

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

**Specification:**

Unit to be model VKS-3012 Stainless Steel Table as manufactured by Advance/Tabco and with the following features:

**Features:**

- Top is furnished with a 2” x 1” square die embossed NO-DRIP countertop edge with a 1/2” return on 3 sides and a 10” splash with a 2” return on the rear side.
- To reinforce and maintain a level working surface, 24” wide tables are supplied with TWO hat channels and 30” and 36” wide tables are supplied with THREE hat channels.
- Pre-engineered welded angle adapters insure ease of future drawer installation.
- Aluminum die cast “leg-to-shelf” clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

**Construction:**

- All TIG welded. Exposed weld areas polished to match adjacent surfaces.
- Entire top mechanically polished to a satin finish. Countertop edge polished to a MIRROR finish.
- Top is sound deadened.
- Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

- Gussets welded to support hat sections.

Materials:

- Top: 14-gauge stainless steel type “304” series.
- Shelf: 18-gauge stainless steel.
- Legs: 1-5/8” diameter tubular, 16-gauge stainless steel type “304” series.
- 1” adjustable stainless steel bullet feet.
- Stainless steel gussets.

Unit to be complete with the following options, accessories and modifications:

- (1) One table modification as shown in elevation. (8) Eight legs, (2) Two undershelves, and open area below sinks.
- (1) One model TA-11D-2 Double 20” x 20” x 12” deep sink bowls located as per plan. (Centered on tabletop)
- (1) One model K-1 swing spout faucet. (Centered on backsplash)
- (2) Two model K-15 lever drain with built-in overflow.

Item #: 119

Description: Beverage Counter

Manufacturer: Advance/Tabco

Model #: BEV-30-72L

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

Specification:

Unit to be model BEV-30-72L Stainless Steel Enclosed Base Beverage Table as manufactured by Advance/Tabco and with the following features.

Top is furnished with a 2” x 1” square die embossed No-Drip countertop edge with 1/2” return on 3 sides. Backsplash shall be coved up 10-1/2” with 2” return to wall at 45 degrees with ends closed. Unit Body Design sides, back and shelf are welded to form a single rigid structure. Furnished with a stainless steel intermediate shelf and a 12” x 20” x 12” deep drawn sink bowl integrally welded to top. 1-1/2” I.P.S. basket type drain.

Top is assembled to body to form a flush fit and is supplied with a 5” x 1” urn trough with no-splash drain plate.

G.F.I. duplex electrical outlet mounted in center of backsplash.

Front hinge door and open back under sink area permits ease-of-installation of plumbing fixtures.

Partial undershelf for storage.

Material: Top is 14-gauge stainless steel type “304” series. Body is 18-gauge stainless steel type “430” series. Legs are 1-5/8” diameter 16-gauge tubular stainless steel with stainless steel gussets and 1” adjustable metal bullet feet. Faucet is splash mounted 4” O.C. with an 8-1/2” diameter gooseneck spout. Supply is 1/2” hot and cold.

Construction: All TIG welded. Top and all exposed surfaces are polished to a satin finish and sound deadened. Countertop edge polished to a mirror finish. Stud welded hat section reinforces and maintains a level working surface.

Item #: 120

Description: Dishtable, Soiled

Manufacturer: Advance/Tabco

Model #: DTS-D30-72R

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

Specification:

Unit to be model DTS-D30-72R Stainless Steel Dishtable, Soiled with landing shelf as manufactured by Advance/Tabco and with the following features:

Features:

- Tile edge for ease of installation.
- 8" deep sink bowl.
- Dishtable system consists of SOIL and CLEAN sections.
- Table is furnished with 10-1/2" splash with a 2" return.

Construction:

- All TIG welded.
- Welded areas blended to match adjacent surfaces and to a satin finish.
- Stainless Steel Gussets welded to a stainless steel support channel.

Mechanical:

- Faucet holes in SPLASH punched on 8" centers, faucet not included.
- Waste drain is 1 1/2" IPS basket type and is included.

Materials:

- 14 ga. 304 Series Stainless Steel Top.
- 16 ga. 304 Stainless Steel Legs Stainless Steel Legs with Welded Cross Bracing & Stainless Steel Bullet Feet.

Unit to be complete with the following options and accessories:

- Size modification: Side along wall to be modified to 6'-0" long.
- Prerinse sink location modification: Prerinse sink to be located 8" from dishwasher end of dishtable.
- Faucet hole location modification: Faucet holes to be centered on prerinse sink location.
- (1) One model DTA-53 Prerinse faucet.
- (1) One model DTA-79 Dishtable Rack Shelf. (71" long)
- (1) One model DTA-SS-66 stainless steel undershelf.
- (1) One Weld-In Disposer Collar
- (1) One Disposer control panel bracket
- (1) One Holes in backsplash for vacuum breaker.

Item #: 121

Description: Disposer

Manufacturer: Insinkerator

Model #: SS-200-7-CC-101

SIS #: T037

Quantity: 1

Alternate Manufacturer: Salvajor

## Specification:

## Product Overview:

- Corrosion resistant stainless steel grind chamber.
- 3/4" (19.1 mm) rubber mounting above grinding chamber, enclosed in chrome plated covers for sanitation and appearance.
- 2 H.P. induction motor with built-in thermal overload protection, 1725 RPM, totally enclosed to provide protection against outside moisture with controlled power air flow to cool motor—provides better efficiency, longer life.
- Cast nickel chrome alloy stationary and rotating shredding elements for long life and corrosion resistance, designed for reverse action grinding.
- Double-tapered Timken roller bearings provide a shock absorbing cushion.
- Triple lip seal protects motor from water damage and secondary spring-loaded oil seal provides double protection against water and loss of grease.
- Stainless steel and chrome plated finish—paint-free for lasting sanitation.

## Unit to be complete with:

- Base disposer: model SS-200
- Mounting Gasket.
- Support Legs.
- Mounting Assembly: #7 Collar Adaptor for welding into sink.
- Electrical Control: CC-101 Auto-Reversing Control Center.
- Syphon breaker: model 13412, (chrome, 45° fittings)
- Solenoid Valve.
- Flow Control Valve.
- Voltage: 208-Volt, 3-Phase, 2-HP, 3.3-Amps

Item #: 122

Description: Dishtable, Clean

Manufacturer: Advance/Tabco

Model #: DTC-S30-72L

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

## Specification:

Unit to be model DTC-S30-72L Stainless Steel Clean Straight Dishtable as manufactured by Advance/Tabco and with the following features:

## Features:

- Tile edge for ease of installation.
- Dishtable system consists of SOIL and CLEAN sections.
- Table is furnished with 10-1/2" splash with a 2" return.

## Construction:

- All TIG welded.
- Welded areas blended to match adjacent surfaces and to a satin finish.
- Stainless Steel Gussets welded to a stainless steel support channel.

## Materials:

- 14 ga. 304 Series Stainless Steel Top.

- 16 ga. 304 Stainless Steel Legs Stainless Steel Legs with Welded Cross Bracing & Stainless Steel Bullet Feet.

Unit to be complete with the following options and accessories:

- (1) One model DTA-SS-54 Stainless steel undershelf.

Item #: 123

Description: Exhaust Hood

Manufacturer: Captive-Aire

Model #: 6030ND-2-PSP-F

SIS #: T037

Quantity: 1

Alternate Manufacturer: Gaylord, Avtec, Halton

Specification:

Units to be model 6030ND-2-PSP-F 18'-0" long exhaust-only wall canopy hood with front perforated supply plenum with built-in 3" back standoff as manufactured by Captive-Aire and with the following features:

Unit to be size and shape as shown on plans and in details.

Description: The model ND is a Type I, double island, exhaust canopy used for collection and removal of grease-laden vapors and smoke over all types of restaurant equipment.

Application: The hood shall provide flexibility in designing kitchen ventilation equipment and shall be tested and listed for use over 450°F light/medium duty cooking surfaces; 600°F heavy duty cooking surfaces; and up to 700°F extra heavy duty cooking surfaces.

Construction: The hood shall be constructed of type 430 stainless steel with #3 or #4 polish where exposed. All seams shall be welded or in conformance with UL 710 standards. Unexposed surfaces shall be constructed of aluminized steel, Individual component construction shall be determined by manufacturer and ETL, Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints and penetrations of the hood where grease-laden vapors and exhaust gases are present must be liquid-tight, continuous external weld in accordance with NFPA 96.

The hood shall be constructed to include: A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA90A and 90B. An Integral front baffle to direct grease laden vapors toward the exhaust filter bank. An integral grease drain system on the hood back with a minimum 1/8" per foot slope, to include an exposed, removable 1/2-pint grease cup to facilitate cleaning. A built-in wiring chase for electrical controls on the front face of the hood designed to avoid penetration of the capture area and eliminate the need for an external chaseway. UL Incandescent light fixtures and globes, allowing up to a 100-watt standard light bulb, installed and pre-wired to a junction box and installed with a maximum of 3'-6" spacing on center. Exhaust duct collar 4" high with 1" flange. A minimum of four connections for hanger rods. Connectors shall have 9/16" holes pre-punched in 1-1/2" x 1-1/2" angle iron at the factory to allow for hanger rod connection by others. UL Classified aluminum baffle filters, with size and quantity determined by the hood's dimensional parameters, but extending the full length of the hood with filler panels not to exceed 6".

Certification: The hood shall be ETL Listed, comply with UL 710 Standards and shall be built in accordance with NFPA96. Hood shall be tested for compliance with the ETL Sanitation Mark.

Documentation: Manufacturer shall furnish complete computer generated submittal drawings including hood section view(s), plan view(s), duct sizing, and CFM and static pressure requirements. Static pressure, air velocity and air volume requirements indicated on drawings shall be precise and accurate and hood shall perform to said specifications. Drawings shall be available to the engineer, architect and owner for their use in construction, operation and maintenance.

The hood shall contain a factory engineered and pre-piped, U.L. Listed, Wet Chemical, Ansul R-102 fire suppression system. The system piping shall be installed in the hood at the time of construction by Captive-Aire. Piping shall be installed above the hood and shall be concealed from view. No exposed piping is acceptable, with the exception of the appliance drops. A certified local Ansul distributor shall be selected by the factory for final system hook-up. The hood manufacturer shall be responsible for the coordination between the contractor and Ansul distributor for the final field hook-up and certification of the fire suppression system.

The system shall be capable of automatic detection and actuation and/or remote manual actuation. The system shall have the fire suppression capabilities to protect the duct(s), plenum(s), filter area(s) and cooking equipment. Accessories shall be available for mechanical or electrical gas line shut-off applications and a double-pole, double-throw micro switch for activation of a shunt trip breaker (provided by others) for electrical equipment. The system shall also include the release assembly, agent tank, detectors, fusible links, liquid tight fittings, 1-1/4" mechanical gas valve, recessed remote manual pull station, and schedule 40 black iron pipe with chrome sleeving for exposed areas.

The hood shall be complete with the following options and accessories:

- 430 Stainless Steel where exposed.
- Insulation for the PSP housing – front.
- Utility Cabinet on the Left and Right Sides.
- Filters – (12) Twelve 20" tall x 16" wide stainless steel Captrate Solo filter with hook, ETL Listed. Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.
- (6) Six L55 series E26 canopy light fixture – high temp assembly. Includes clear thermal and shock resistant globe (L55 Fixture).
- (6) Six Screw in 12W LED Bulb, L55 Series E26 Canopy Light Fixture – High Temp Assembly, 2700K-3500K, Includes Clear Thermal and Shock Resistant Globe.
- (2) Two Exhaust Riser – Factory installed 12" diameter x 4" height.
- (3) Three Supply Riser – 10" x 24" supply riser with volume dampers.
- (2) Two Supply Riser – 8" x 36" supply riser with volume dampers.
- (4) Four ½ pint grease cup new style, flanged slotted.
- Field wrapper: 12" high, front, left and right.
- (1) One Backsplash: 80" high x 256" long 430 stainless steel horizontal. (Includes end caps and divider bars.
- (1) One Structural Front Panel
- (2) Two Vertical End Panels (Left and Right) 27" Top Width, 21" Bottom Width, 80" High Insulated 430 stainless steel.
- (2) Two Electrical package installation in utility cabinet by Captive-Aire.

Hood to be complete with a Demand Control Ventilation Electrical System:



**Application:** The Demand Control Ventilation System (DCV) is designed to automatically reduce exhaust and supply airflow quantities, while ensuring hood performance is maintained. The DCV uses Variable Frequency Drives (VFD) and temperature sensors in the exhaust ducts to modulate the fans speed during cooking operation and maximize energy savings. The LCD screen interface provides fan(s) control, system configuration, and diagnostic information.

**Construction:**

The DCV includes:

- Smart Controller
- LCD Screen Interface
- Duct Temperature Sensor(s)
- Room Temperature Sensor
- Variable Frequency Drive(s)

Controls shall be listed by ETL (UL 508A).

The system includes a LCD screen interface for fan(s) and hood lights control, wash control (if applicable), gas valve reset, programmable schedule, Max Air Override function, Preparation Time mode, Cool Down mode, and diagnostics including VFD status. The LCD screen shows descriptive plain text explaining the functions or values.

The LCD screen interface will be installed on the face of the hood, on the face of the utility cabinet or on the face of a wall mounted control enclosure.

Control enclosure will be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. Control enclosure may be constructed of stainless steel or painted steel.

The smart controller will constantly monitor the exhaust air temperature through the riser mounted temperature sensor and modulate the fan speeds accordingly.

A room temperature sensor will also be provided for field installation in the kitchen space in order to start the fan(s) based on the temperature differential between the room and the exhaust air in the duct rather than fixed set-points.

A Preparation Time Mode is available for morning operation: dedicated make-up air will be locked out only allowing the use of transfer air during this mode. Exhaust fan(s) will run at low CFM while maintaining a balanced kitchen pressure.

A Cool Down Mode is designed for equipment cool-down period at the end of the daily cooking operations: similarly to Preparation Time mode, dedicated make-up air will be locked out only allowing the use of transfer air during this mode. Exhaust fan(s) will run at low CFM while maintaining a balanced kitchen pressure.

Fan maximum/ minimum speeds will be adjustable for proper kitchen balance. Fan direction change is also available from the smart controller configuration menu without need for rewiring.

Duct Temperature Sensor(s) will be mounted in the exhaust hood riser(s). Temperature probe will be constructed of Stainless Steel. System will be factory pre-set to modulate fan speed within a range of 45°F for 600°F and 700°F cooking applications and a range of 5°F for 400°F cooking applications. Set points are fully adjustable through the touch screen interface based on application needs.

The Max Air Override will have an adjustable timeout value.

The panels include color-coded wiring with as-built wiring diagrams and spare terminals controlled by the fire system micro switch. The panel is factory pre-wired to shut supply fans down in a fire condition. Options to turn ON the exhaust fans or turn off the hood

lights in a fire condition will be configurable through the smart controller, but only through a password protected menu to prevent any changes after a fire inspection has been performed.

Item #: 124

Description: Exhaust Hood

Manufacturer: Captive-Aire

Model #: 6030ND-2-PSP-F

SIS #: T037

Quantity: 1

Alternate Manufacturer: Gaylord, Avtec, Halton

Specification:

Units to be model 6030ND-2-PSP-F 27'-0" long exhaust-only wall canopy hood with front perforated supply plenum with built-in 3" back standoff as manufactured by Captive-Aire and with the following features:

Unit to be size and shape as shown on plans and in details.

Description: The model ND is a Type I, double island, exhaust canopy used for collection and removal of grease-laden vapors and smoke over all types of restaurant equipment.

Application: The hood shall provide flexibility in designing kitchen ventilation equipment and shall be tested and listed for use over 450°F light/medium duty cooking surfaces; 600°F heavy duty cooking surfaces; and up to 700°F extra heavy duty cooking surfaces.

Construction: The hood shall be constructed of type 430 stainless steel with #3 or #4 polish where exposed. All seams shall be welded or in conformance with UL 710 standards. Unexposed surfaces shall be constructed of aluminized steel, Individual component construction shall be determined by manufacturer and ETL, Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints and penetrations of the hood where grease-laden vapors and exhaust gases are present must be liquid-tight, continuous external weld in accordance with NFPA 96.

The hood shall be constructed to include: A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA90A and 90B. An Integral front baffle to direct grease laden vapors toward the exhaust filter bank. An integral grease drain system on the hood back with a minimum 1/8" per foot slope, to include an exposed, removable 1/2-pint grease cup to facilitate cleaning. A built-in wiring chase for electrical controls on the front face of the hood designed to avoid penetration of the capture area and eliminate the need for an external chaseway. UL Incandescent light fixtures and globes, allowing up to a 100-watt standard light bulb, installed and pre-wired to a junction box and installed with a maximum of 3'-6" spacing on center. Exhaust duct collar 4" high with 1" flange. A minimum of four connections for hanger rods. Connectors shall have 9/16" holes pre-punched in 1-1/2" x 1-1/2" angle iron at the factory to allow for hanger rod connection by others. UL Classified aluminum baffle filters, with size and quantity determined by the hood's dimensional parameters, but extending the full length of the hood with filler panels not to exceed 6".

Certification: The hood shall be ETL Listed, comply with UL 710 Standards and shall be built in accordance with NFPA96. Hood shall be tested for compliance with the ETL Sanitation Mark.

Documentation: Manufacturer shall furnish complete computer generated submittal drawings including hood section view(s), plan view(s), duct sizing, and CFM and static

pressure requirements. Static pressure, air velocity and air volume requirements indicated on drawings shall be precise and accurate and hood shall perform to said specifications. Drawings shall be available to the engineer, architect and owner for their use in construction, operation and maintenance.

The hood shall contain a factory engineered and pre-piped, U.L. Listed, Wet Chemical, Ansul R-102 fire suppression system. The system piping shall be installed in the hood at the time of construction by Captive-Aire. Piping shall be installed above the hood and shall be concealed from view. No exposed piping is acceptable, with the exception of the appliance drops. A certified local Ansul distributor shall be selected by the factory for final system hook-up. The hood manufacturer shall be responsible for the coordination between the contractor and Ansul distributor for the final field hook-up and certification of the fire suppression system.

The system shall be capable of automatic detection and actuation and/or remote manual actuation. The system shall have the fire suppression capabilities to protect the duct(s), plenum(s), filter area(s) and cooking equipment. Accessories shall be available for mechanical or electrical gas line shut-off applications and a double-pole, double-throw micro switch for activation of a shunt trip breaker (provided by others) for electrical equipment. The system shall also include the release assembly, agent tank, detectors, fusible links, liquid tight fittings, 1-1/4" mechanical gas valve, recessed remote manual pull station, and schedule 40 black iron pipe with chrome sleeving for exposed areas.

The hood shall be complete with the following options and accessories:

- 430 Stainless Steel where exposed.
- Insulation for the PSP housing – front.
- Utility Cabinet on the Right Side.
- Filters – (20) Twenty 20" tall x 16" wide stainless steel Captrate Solo filter with hook, ETL Listed. Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.
- (8) Eight L55 series E26 canopy light fixture – high temp assembly. Includes clear thermal and shock resistant globe (L55 Fixture).
- (8) Eight Screw in 12W LED Bulb, L55 Series E26 Canopy Light Fixture – High Temp Assembly, 2700K-3500K, Includes Clear Thermal and Shock Resistant Globe.
- (4) Four Exhaust Riser – Factory installed 12" diameter x 4" height.
- (4) Four Supply Riser – 10" x 28" supply riser with volume dampers.
- (4) Four Supply Riser – 12" x 24" supply riser with volume dampers.
- (4) Four ½ pint grease cup new style, flanged slotted.
- Field wrapper: 12" high, front, left and right.
- (1) One face mount 1<sup>st</sup> switch.
- (1) One face mount extra switch.
- (1) One Backsplash: 80" high x 572" long 430 stainless steel horizontal. (Includes end caps and divider bars.
- (1) One Left Sidesplash: 80" high x 60" long 430 stainless steel horizontal. (Includes end caps and divider bars.)
- (1) One Left End Standoff (Finished) 1" wide 60" long insulated.
- (1) One Backsplash – Inside Corner 80" high x 2" leg Length 430 Stainless Steel Vertical. (Includes end caps and divider bars.)
- (1) One Structural Front Panel
- (1) One Right Vertical End Panel 27" Top Width, 21" Bottom Width, 80" High Insulated 430 stainless steel.

- (1) One Electrical package installation in utility cabinet by Captive-Aire.

Hood to be complete with a Demand Control Ventilation Electrical System:

Application: The Demand Control Ventilation System (DCV) is designed to automatically reduce exhaust and supply airflow quantities, while ensuring hood performance is maintained. The DCV uses Variable Frequency Drives (VFD) and temperature sensors in the exhaust ducts to modulate the fans speed during cooking operation and maximize energy savings. The LCD screen interface provides fan(s) control, system configuration, and diagnostic information.

Construction:

The DCV includes:

- Smart Controller
- LCD Screen Interface
- Duct Temperature Sensor(s)
- Room Temperature Sensor
- Variable Frequency Drive(s)

Controls shall be listed by ETL (UL 508A).

The system includes a LCD screen interface for fan(s) and hood lights control, wash control (if applicable), gas valve reset, programmable schedule, Max Air Override function, Preparation Time mode, Cool Down mode, and diagnostics including VFD status. The LCD screen shows descriptive plain text explaining the functions or values.

The LCD screen interface will be installed on the face of the hood, on the face of the utility cabinet or on the face of a wall mounted control enclosure.

Control enclosure will be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. Control enclosure may be constructed of stainless steel or painted steel.

The smart controller will constantly monitor the exhaust air temperature through the riser mounted temperature sensor and modulate the fan speeds accordingly.

A room temperature sensor will also be provided for field installation in the kitchen space in order to start the fan(s) based on the temperature differential between the room and the exhaust air in the duct rather than fixed set-points.

A Preparation Time Mode is available for morning operation: dedicated make-up air will be locked out only allowing the use of transfer air during this mode. Exhaust fan(s) will run at low CFM while maintaining a balanced kitchen pressure.

A Cool Down Mode is designed for equipment cool-down period at the end of the daily cooking operations: similarly to Preparation Time mode, dedicated make-up air will be locked out only allowing the use of transfer air during this mode. Exhaust fan(s) will run at low CFM while maintaining a balanced kitchen pressure.

Fan maximum/ minimum speeds will be adjustable for proper kitchen balance. Fan direction change is also available from the smart controller configuration menu without need for rewiring.

Duct Temperature Sensor(s) will be mounted in the exhaust hood riser(s). Temperature probe will be constructed of Stainless Steel. System will be factory pre-set to modulate fan speed within a range of 45°F for 600°F and 700°F cooking applications and a range of 5°F for 400°F cooking applications. Set points are fully adjustable through the touch screen interface based on application needs.

The Max Air Override will have an adjustable timeout value.

The panels include color-coded wiring with as-built wiring diagrams and spare terminals controlled by the fire system micro switch. The panel is factory pre-wired to shut supply fans down in a fire condition. Options to turn ON the exhaust fans or turn off the hood lights in a fire condition will be configurable through the smart controller, but only through a password protected menu to prevent any changes after a fire inspection has been performed.

Item #: 125

Description: Work Table with Sink

Manufacturer: Advance/Tabco

Model #: VKS-305/TA-11D

SIS #: T037

Quantity: 1

Alternate Manufacturer: Eagle, Custom Fabricated

Specification:

Unit to be model VKS-305 Stainless Steel Table as manufactured by Advance/Tabco and with the following features:

Features:

- Top is furnished with a 2" x 1" square die embossed NO-DRIP countertop edge with a 1/2" return on 3 sides and a 10" splash with a 2" return on the rear side.
- To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.
- Pre-engineered welded angle adapters insure ease of future drawer installation.
- Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

Construction:

- All TIG welded. Exposed weld areas polished to match adjacent surfaces.
- Entire top mechanically polished to a satin finish. Countertop edge polished to a MIRROR finish.
- Top is sound deadened.
- Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.
- Gussets welded to support hat sections.

Materials:

- Top: 14-gauge stainless steel type "304" series.
- Shelf: 18-gauge stainless steel.
- Legs: 1-5/8" diameter tubular, 16-gauge stainless steel type "304" series.
- 1" adjustable stainless steel bullet feet.
- Stainless steel gussets.

Unit to be complete with the following options, accessories and modifications:

- (1) One table modification as shown in elevation. (6) Six legs, (1) One undershelf, and open area below sinks with crossbracing at rear and end.
- (1) One model TA-11D 20" x 20" x 12" deep sink bowls located as per plan.
- (1) One model K-1 swing spout faucet.

- (1) One model K-15 lever drain with built-in overflow.

Item #: 126

Description: Display Merchandiser

Manufacturer: True

Model #: TDM-DC-59-GE/GE-B-W

SIS #: T037

Quantity: 2

Specification:

Unit to be model TDM-DC-59-GE/GE-B-W Dry Case Display Merchandiser as manufactured by True Food Service Equipment and with the following features:

Design: True's "dry" display case combines efficient, high volume merchandising with an elegant curved glass front for sophisticated presentation of high end desserts and pastries. Designed to provide an attractive companion to our TDM-R "refrigerated" display merchandiser.

Cabinet Construction: Exterior - powder coated FDA black rounded front and back, black aluminum aesthetic side and front panels. Color options available at no charge - white or stainless. Curved glass front and side glass panels. Interior - powder coated FDA white over CRS material. Color options available (upcharge applies) - black or stainless. Insulation - entire cabinet structure is foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP). Welded, heavy duty steel frame rail, black powder coated for corrosion protection. Frame rail fitted with leg levelers.

Curved Front Display Glass: Curved glass front and side panels are single pane tempered glass. Front glass opens from closed to fully open to provide extra-large viewing area to maximize product presentation while allowing full frontal access.

Rear Doors: Two (2) rear sliding glass doors for back access. Each door fitted with 12" long aluminum handle. Sliding doors ride on stainless steel V-channel with stainless steel bearings. Doors fit within plastic channel frame.

Shelving: Three (3) adjustable heavy duty PVC coated wire shelves standard. Each shelf supports a maximum weight of 150 lbs.

Pan Capacity: Cabinet holds six (6) 18"L x 26"D display pans and eight (8) 12"L x 18"D display pans. Pans supplied by others.

Lighting: LED interior lighting, two (2) clips underneath shelf to keep wires in place. Safety shielded.

Model Features: Front glass swings Up for easy cleaning access. Pull out condensing unit slides out for easy cleaning and maintenance. Electronic temperature control. NSF-2 compliant for open food product.

Electrical: Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15-amp dedicated outlet. Cord and plug set included.

## **Culinary Arts/Baking Kitchen Existing Equipment**

Item #: K1

Description: Range, 6-Burner (Existing)

Manufacturer: Garland

Model #: G36-6R

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K2

Description: Char-Broiler with Stand (Existing)

Manufacturer: Star

Model #: 6024CBF

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K3

Description: Tilting Skillet (Existing)

Manufacturer: Market Forge

Model #: 30P-STGL

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K4

Description: Kettle, 12-Gallon with Stand (Existing)

Manufacturer: Cleveland

Model #: KGT-12T

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K5

Description: Convection Steamer (Existing)

Manufacturer: Cleveland  
Model #: 21 CGA 5  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K6  
Description: Food Processor (Existing)  
Manufacturer: Robot Coupe  
Model #: R 302  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K7  
Description: Moffat Convection Oven (Existing)  
Manufacturer: Moffat  
Model #: G32D5  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K8  
Description: Convection Oven (Existing)  
Manufacturer: Blodgett  
Model #: Zephair-200-G-Double  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K9  
Description: Mixer, 20-Quart (Existing)  
Manufacturer: Hobart  
Model #: A-200  
SIS #: T037



Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K10

Description: Mixer, 8-Quart (Existing)

Manufacturer: Globe

Model #: SP8

SIS #: T037

Quantity: 8

Specification:

Existing equipment to be relocated as per plan.

Item #: K11

Description: Mixer, 40-Quart (Existing)

Manufacturer: Globe

Model #: SP40

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K12

Description: Mixer, 12-Quart (Existing)

Manufacturer: Univex

Model #: SRM12

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K13

Description: Ice Cream Maker

Manufacturer: Cuisinart

Model #: ICE-50BC

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K14  
Description: Range, 6-Burner with Salamander (Existing)  
Manufacturer: Garland  
Model #: G36-6R/GIR36  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K15  
Description: Griddle with Stand (Existing)  
Manufacturer: Star  
Model #: 636 TCHSF  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K16  
Description: Fryer (Existing)  
Manufacturer: Pitco  
Model #: 35C+S  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K17  
Description: Coffee Brewer (Existing)  
Manufacturer: Fetco  
Model #: CBS-32AAP  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K18

Description: Ice Machine with Bin (Existing)

Manufacturer: Scotsman

Model #: CU2026SA-1

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K19

Description: Refrigerated Sandwich Unit (Existing)

Manufacturer: True

Model #: TSSU-48-08

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K20

Description: Toaster, Conveyor (Existing)

Manufacturer: Hatco

Model #: TQ-10

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K21

Description: Hot Water Dispenser (Existing)

Manufacturer: Bloomfield

Model #: 1222

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K22

Description: Slicer (Existing)

Manufacturer: Hobart  
Model #: Unknown  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K24  
Description: Moffat Proofing Cabinet (Existing)  
Manufacturer: Moffat  
Model #: P8M  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K26  
Description: Sink, 3-Compartment (Existing)  
Manufacturer: Fabricated  
Model #: Custom  
SIS #: T037  
Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

Item #: K37  
Description: Shelving Unit (Existing)  
Manufacturer: Varies  
Model #: Varies  
SIS #: T037  
Quantity: 13

Specification:

Existing equipment to be relocated as per plan.

Item #: K55  
Description: Sheet Pan Rack (Existing)  
Manufacturer: Varies  
Model #: Varies  
SIS #: T037

Quantity: 2

Specification:

Existing equipment to be relocated as per plan.

Item #: K61

Description: Demo Table with Mirror (Existing)

Manufacturer: Fabricated

Model #: Custom

SIS #: T037

Quantity: 1

Specification:

Existing equipment to be relocated as per plan.

**---END OF SECTION---**

**SECTION 11 53 00  
LABORATORY EQUIPMENT****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fume Hoods.
- B. Filtering chemical storage cabinets.
- C. Safety cabinet filtration systems.
- D. Safety cabinet.
- E. Emergency eyewash and shower cabinet.

**1.02 RELATED REQUIREMENTS**

- A. Section 12 34 00 - Plastic Laminate Casework.
- B. Section 12 36 00 - Countertops.
- C. Division 22 - Plumbing: Plumbing contractor shall provide all supply/return service lines and final connections for all equipment installations.
- D. Division 23 - HVAC: Mechanical contractor shall provide exhaust rough-ins, ducting, final connections and balancing of hood system.
- E. Division 26 - Electrical: Electrical contractor shall provide all electrical service rough-ins, and final connections for all equipment installations.

**1.03 QUALITY ASSURANCE**

- A. Fume hood and filtration systems manufacturer shall have a minimum of ten years' experience in the manufacture of laboratory fume hoods and equipment.
- B. Air balancing and blower adjustments to provide proper operation and design air flow for laboratory fume hoods per SEFA 1 test procedures shall be part of the Work of this Section. The fume hood subcontractor shall employ the services of the mechanical subcontractor's balancing agent, or another approved balancing agent. Prior to any balancing activities, the proposed balancing agent shall be submitted to the Architect. Submit copies of the air balancing report to the Architect.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- B. Pre-installation Meeting: Convene at least two weeks before starting work of this Section.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide equipment dimensions and construction, equipment capacities, physical dimensions, utility and service requirements and locations.
  - 1. Submit test reports for fume hood, verifying conformance to test requirements of ASHRAE 110 for face velocity, smoke challenges and containment efficiency.
- C. Shop Drawings: Indicate equipment locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, clearances required.
- D. Samples: Submit samples of exposed finish surfaces, 3 x 3 inches minimum in size illustrating color and finish.
- E. Operation Data: Include description of equipment operation and required adjusting and testing.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in manufacturing the types of products specified in this Section, with minimum fifteen years of documented experience.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Except where more stringent warranty requirements are provided, all equipment furnished under this Section shall be guaranteed for a minimum of one year, parts, and labor from date of Substantial Completion against defective materials, design and workmanship.

**PART 2 PRODUCTS****2.01 FUME HOODS**

- A. Fume Hood: Hood assembly shall include all necessary components and design features to perform as a completely autonomous exhaust and filtration system, entirely independent of and unaffected by the building mechanical systems. Cabinet shall allow view from all sides. Metal components with powder coat finish; constant force sash counterbalance; U.L. listed poly resin liner; T-8 lamped fluorescent light for minimum 80 foot candles; flush-mount airfoil; sash with full length finger lift; louvered front for by-pass. Duct connection: 10" round.
  - 1. Quantity Required: One.
  - 2. External Size: 48" W x 30" D x 52" min to 61.25" H.
  - 3. Air Flow: 469 CFM at 100 LFM; 0.25 SP at hood – See catalog
  - 4. Single sided.
  - 5. Electrical Requirements: Duplex 120V convenience outlet; data outlet for camera furnished by Owner.
  - 6. Standard Equipment: Phenolic resin work surface and cup sink with cold water faucet, gooseneck spout with deck mounted gas cock.
  - 7. Other Equipment: Air flow monitor alarm.
  - 8. Product: Eliminator HP Series by Air Master Systems Corp.
  - 9. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 STORAGE CABINETS AND FILTRATION SYSTEMS**

- A. Filtering Chemical Storage Cabinets ("Vented Cabinets"): Cabinet metallic parts shall be anti-corrosion treated steel with polyester coating. Door shall be 1/4" thickness acrylic. Filtration module and shelves shall be injected polypropylene. Quantity Required: One
  - 1. Size: 31.5" W x 20" D x 80.75" H.
  - 2. Number of Fans: One.
  - 3. Number and Type of Filters: One; type BE carbon.
  - 4. Electrical Requirements: 120v/60 Hz, 45w, 1 phase; Cord and plug
  - 5. Air Flow: 44cfm.
  - 6. Products: Captainstore 832 by Erilab Inc.
  - 7. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Flammable Safety Cabinet: NFPA and OSHA compliant, FM approved, 18 gauge corrosion resistant steel; 2 self-closing doors, 180 degree opening; 1 adjustable galvanized steel shelf; 2" bottom leak-proof sump; U-lock handle with cylinder lock.
  - 1. Quantity Required: One.
  - 2. Capacity: 22 gallons.
  - 3. Warranty: Ten years.
  - 4. Exterior Dimensions: 35" W x 22" D x 35" H.
  - 5. Product: Sure-grip 892320 by Justrite Manufacturing Co.
  - 6. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Corrosives / Acid Safety Cabinet: NFPA and OSHA compliant, FM approved, 18 gauge corrosion resistant steel, double wall construction, dual vents, corrosion resistant steel; 2 self-

closing doors, 180 degree opening; 1 adjustable galvanized steel shelf; 2" bottom leak-proof sump; U-lock handle with cylinder lock.

1. Quantity Required: One.
2. Capacity: 22 gallons.
3. Warranty: Ten years.
4. Exterior Dimensions: 35" W x 22" D x 35" H.
5. Product: Sure-grip 892322 by Justrite Manufacturing Co.
6. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 EMERGENCY EYEWASH AND SHOWER CABINET**

- A. Emergency Face / Eye Wash Cabinet: Barrier-free unit; SEFA 8 compliant.
  1. Cabinet: Maple with stained finish to match plastic laminate science cabinets.
  2. Size: 36" wide x 24" deep x 84" high.
  3. Product: Barrier-free version of SC-3584SC-ADA by Hann Manufacturing Inc.
    - a. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that rough-in frames, anchors, mechanical and electrical rough-ins, and supports are accurately placed.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with standards required by Authority Having Jurisdiction.
- C. Anchor equipment securely in place.

### **3.03 INTERFACE WITH OTHER PRODUCTS**

- A. Coordinate installation of casework with fume hoods and student work stations.

### **3.04 ADJUSTING**

- A. Adjust operating equipment to efficient operation.

**END OF SECTION**



**SECTION 12 34 00**  
**PLASTIC LAMINATE CASEWORK**

**PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Plastic Laminate Casework.

**1.02 RELATED SECTIONS**

- A. Section 06 20 00 - Finish Carpentry.
- B. Section 09 21 16 - Gypsum Board Assemblies.
- C. Section 09 65 00 - Resilient Flooring: Resilient base installation on casework.
- D. Section 11 53 00 - Laboratory Equipment: Fume hoods, storage units, safety cabinets.
- E. Section 12 36 00 - Countertops: All countertops for millwork and casework, including Laboratory countertops.
- F. Division 22 - Plumbing.
- G. Division 23 - HVAC.
- H. Division 26 - Electrical.

**1.03 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and installation instructions on all products specified herein.
- B. Shop Drawings: Submit shop drawings indicating floor plan casework layout and elevations at not less than 1/4" scale. Show materials, dimensions, equipment and appliance cut-out locations, all plumbing, electrical, ventilating and other service connections. Submit shop drawings at not less than 1/2" scale, indicating details of construction of all casework components and all locations required for back-up blocking provided by other Sections.
  - 1. Special care shall be taken to ensure proper interface between any casework requiring coordination with work specified in Section 11 53 00 - Laboratory Equipment, Division 22 - Plumbing, Division 23 - HVAC and Division 26 - Electrical. Thoroughly review all Drawings in order to determine locations of plumbing fixtures, appliances, electrical fixtures, plenum requirements, and other miscellaneous items and indicate same on the shop drawings.
  - 2. Field Measurements: Verify all building dimensions relative to equipment to be furnished and installed by taking actual field measurements at the job site prior to casework fabrication.
- C. Samples:
  - 1. Upon request of Architect, submit a full size cabinet sample showing all aspects of typical construction.
  - 2. Submit samples of fixtures, hardware and plastic laminates. A minimum of seventy (70) plastic laminate colors and patterns shall be available as standard selections.
- D. Project Close-out: Submit operating instructions, maintenance manuals, parts lists for each piece of equipment. Provide name, address and telephone number of the manufacturer's representative and service company for each piece of equipment, so that service or spare parts can be readily obtained.

**1.04 QUALITY ASSURANCE**

- A. Casework products shall comply with applicable standards of the AWI Architectural Woodwork Quality Standards, for custom millwork.
- B. Casework installation contractor shall be approved by the manufacturer and shall provide adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and also are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

- C. Comply with applicable electrical, mechanical and plumbing, accessibility and other codes and regulations of all Federal, State and Local authorities having jurisdiction.

#### **1.05 DELIVERY, STORAGE AND PROTECTION**

- A. Protect all casework during transit, delivery, storage and handling to prevent damage, soiling and deterioration. Store under cover in ventilated building not exposed to extreme temperature and humidity changes. Do not store or install casework in building until concrete, masonry, and plaster work is dry.
- B. Do not deliver casework until painting, wet work, grinding, and similar operations, which could be performed before installation of cabinets have been completed in installation areas. Store casework in installation areas or, if that is impracticable, in areas with ambient conditions meeting the same requirements.
- C. On the protective crating, or on a concealed but accessible surface of each item of the Work of this Section, plainly mark an identifying code or tag to aid in rapid and efficient location of each item's specific installation point within the building.

#### **1.06 JOB CONDITIONS**

- A. Manufacturer shall advise Contractor of temperature and humidity requirements for casework installation areas. Do not install casework until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
- B. Maintain temperature and humidity in installation areas as required to maintain moisture content of installed cabinet work within a tolerance range of the optimum moisture content acceptable to the casework manufacturer, from date of installation through remainder of construction period.

#### **1.07 WARRANTY**

- A. The manufacturer shall warranty that casework and other products furnished shall be free from defects in material and workmanship when properly installed and under normal use for a period of two (2) years from the date of Substantial Completion. Upon notification of any such defects within said warranty period, the manufacturer shall promptly make all necessary repairs and replacements at no cost or expense to the Owner.

### **PART 2 - PRODUCTS**

#### **2.01 GENERAL**

- A. Plastic Laminate Faced Casework Basis of Design:
  - a. Basis of Design: TMI Systems Corporation.
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.02 CASEWORK MATERIALS**

- A. Plastic Laminate: All exposed exterior surfaces shall faced with a high pressure plastic laminate meeting NEMA LD3; VGS, 0.028 inch thickness. Cabinet semi-exposed interior faces shall be finished with a CLS 0.020" liner. Concealed surfaces shall be finished with a backer for balanced construction.
- B. Substrate Panels: Particle Board (PB); ANSI A208.1; Class M2, 45 pcf minimum density; no urea formaldehyde-added (NAUF), composed of wood fibers pressure bonded with adhesive to suit application; sanded faces; thicknesses as required.
  - 1. High stress areas such as drawer bodies shall use ANSI A208.1 medium density fiberboard; 48 pcf density.
- C. Low Pressure Laminate Panels: Thermo-fused; NEMA LD 3; particle board core as specified above; surfaced both faces; for concealed surfaces. Color as selected from manufacturer's standard solid colors

- D. Edge Banding: ABS or PVC, smooth finish; width to match component thickness and length required; applied with hot melt adhesive. Color shall be as selected from the manufacturer's full range.
  - 1. Applications:
    - a. Door and drawer front edges; end panels: 3 mm thickness.
    - b. Shelf edges, cabinet body edges semi-exposed; drawer boxes: 0.02 mm thickness.
- E. Glazing: Clear tempered glass.

## 2.03 CASEWORK CABINETS

- A. Base Cabinets: Fully enclosed at the bottom for all cabinet types.
- B. Base and Tall Cabinet Tops and Bottoms and Vertical Members: 3/4" thickness.
- C. Wall Cabinet Tops and Bottoms: 1" thickness.
- D. Cabinet Frame Rails: 3/4" x 3-3/4".
- E. Toe Kicks: 3/4" x 3-3/4" integral to cabinet inset from cabinet front and back edge.
- F. Adjustable Shelves: Less than 36" long: 3/4" thickness; 36" and longer: 1" thickness.
  - 1. Semi-concealed shelves: Melamine with plastic banding.
  - 2. Exposed shelves: Substrate panel with high-pressure plastic laminate both faces with plastic banding.
- G. Doors Panels: 3/4" thickness.
- H. Drawers: Full box design with a separate front panel; 3/4" thickness with 1/4" bottom panel.
- I. Cabinet components shall be joined by hardwood dowels or mechanical fasteners.
- J. Backs: Pre-finished MDF; 1/4" thickness; secured to back cross rail, cabinet bottom and dadoed into cabinet sides. Backs shall be recessed 3/4" to permit accurate scribing to the wall.
- K. Wall Cabinet Filler Panels for electrical devices shall include top closures.
- L. Finished End Panels: 3/4" thickness; finished both sides.

## 2.04 CASEWORK HARDWARE

- A. Hinges: Wrap around, five-knuckle pin, heavy-duty institutional type with rounded ends, 2-3/4" high by .095 thick. Fasteners concealed when door is closed. Two hinges at doors under 44" high; three hinges at doors over 44" high. Color: Stainless Steel to match Section 06 41 00.
- B. Pulls: 4" wire pull design; Stainless Steel color to match Section 06 41 00.
- C. Catches: Heavy duty spring loaded, double action, nylon roller catches, at all doors. Tall doors shall have a top and bottom catch.
- D. Locks: Heavy-duty, cylinder type with removable and interchangeable six disc tumblers; die cast body with dead bolt engagement tang; keyed and master keyed as specified.
  - 1. Provide for all doors and drawers.
- E. Drawer Slides: Extension slides bottom and side mounted; epoxy coated steel; ball bearing with nylon rollers; 100 lb load rating.
- F. Shelf Supports: Injection molded clear polycarbonate with integral molded lock tab; 5mm double pin engagement to bored hole in cabinet; 200 lb per clip load rating; 4 point shelf supports; shelves over 27" shall have 5 point support. Bronze color to match Section 06 41 00.

## 2.05 CASEWORK COMPONENT UNIT DESCRIPTION

- A. The following is a description of the items to be furnished and installed. Refer to the floor plans and casework drawings for additional information. See casework elevations for required base cabinet heights, widths and special cabinet depths.  
Architectural Drawing Designation and Description:

### BASE CABINETS - WITH DOORS

BC                      Base Cabinet (height and width as indicated on Drawings)

	23"d (U.N.O on dwgs), 2 door, 1 adj. Shelf
BC12	Base Cabinet (height as indicated on Drawings)
	11"d (U.N.O on dwgs), 32"w, 2 door, 1 adj. Shelf
BC30	Base Cabinet (height as indicated on Drawings)
	29"d (U.N.O on dwgs), 32"w, 2 door, 1 adj. Shelf

**SINK BASE CABINETS**

BCS	Base Cabinet (height and width as indicated on Drawings)
	23"d (U.N.O on dwgs), 1 door
SA	Base Cabinet (height and width as indicated on Drawings)
	23"d (U.N.O on dwgs), 5-1/4"h x 1" thick apron panel, removable back panel
SA30	Base Cabinet (height and width as indicated on Drawings)
	29"d (U.N.O on dwgs), 5-1/4"h x 1" thick apron panel, removable back panel

**TALL CABINETS**

TCSD & TC2D	Tall Storage Cabinet
	23"d, 84"h, 36"w, 1 adj shelf, 2 doors

**WALL CABINETS - DOORS** Note: Addition of suffix G denotes glass doors.

WC12	Wall Cabinet - 2 doors (height and width as indicated on Drawings)
	12"d, 2 adj. shelf
WC & WCS	Wall Cabinet - 2 doors (height and width as indicated on Drawings)
	15"d, 2 adj. shelf

Filler Panels/Scribes: Flush with adjacent cabinet face, as required for a complete, neat installation. Use of surface mounted moldings is not acceptable.

**2.06 COUNTERTOPS**

- A. Countertops, laboratory countertops and laboratory sinks: See Section 12 36 00 - Countertops.

**2.07 STUDENT TABLES**

- A. Tops: Laboratory epoxy resin. See Section 12 36 00 - Countertops.

**PART 3 - EXECUTION****3.01 COORDINATION**

- A. Coordinate Work of this Section with related Work of other Sections as necessary to obtain proper installation of all items.
- B. Verify site dimensions of cabinet locations in building prior to fabrication.
- C. Examine space in which specified Work is to be installed to assure that conditions are satisfactory for the installation of specified Work. Report in writing to the Architect, any deficiency in the work of other contractors affecting specified Work. Commencement of Work shall be construed as acceptance of space conditions.
- D. Verify adequacy of backing and support framing. Verify type of support framing for determination of proper fastener type. A minimum load of 60 pounds/LF for wall cabinets shall be supported. Provide a safety factor of 2.
- E. Verify location and sizes of utility rough-in associated with work of this Section.
- F. Casework shall be conditioned to the space humidity and temperature conditions prior to installation

**3.02 INSTALLATION**

- A. Install casework, components and accessories in accordance with manufacturer's instructions. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level. Install to a tolerance of 1/8" in 8'-0" for plumb and level and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offsets in revealed adjoining surfaces.
- B. Attach wall mounted cabinets to support blocking following industry standards and best practices. Ensure that proper fastener type is utilized for support structure material.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages. Base toe kick board shall be scribed to uneven floor surfaces.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- G. Install without distortion so that doors and drawers will fit openings properly and be accurately aligned.
- H. Cut and fit work around pipes, ducts, etc. All shims under cabinets at floors shall be continuous for proper support of cabinets, and shall be water-resistant.
- I. Install all items complete and adjust all moving parts to operate properly. Leave surfaces clean and free from defects at time of final acceptance.
- J. Cabinets set off from a wall surface shall have extended finished ends, and top and bottom closure panels to the wall surface.
- K. Workmen: Install casework under the supervision of the manufacturer's representative with factory-trained mechanics authorized by manufacturer.

**3.03 CLEAN-UP, PROTECTION AND INSTRUCTION**

- A. Clean-Up: Remove all cartons, debris, sawdust, scraps, etc. and leave spaces clean and all casework ready for Owner's use. Following completion, and before Owner takes occupancy, clean finished surfaces in accordance with the manufacturer's instructions, and leave specified Work free of imperfections.
- B. Protect specified Work from damage until Owner takes occupancy.
- C. Damaged Work as determined by the Architect, shall be repaired, or replaced as determined, by, and to the satisfaction of, the Architect.

**END OF SECTION**

**SECTION 12 36 00  
COUNTERTOPS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Countertops for architectural millwork, manufactured caseworks, wall-hung counters.
- B. Solid surface and epoxy resin sinks.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 20 00 - Finish Carpentry: Countertop end panels, cleats, support brackets and grommets.
- D. Section 12 34 00 - Plastic Laminate Casework.
- E. Division 22 - Plumbing: Sinks.

**1.03 REFERENCE STANDARDS**

- A. ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.
- B. ANSI A208.1 - American National Standard for Particleboard; 2009.
- C. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.
- D. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2010.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
- F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
- G. ISSFA-2 - Classification and Standards for Solid Surfacing Material.
- H. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets for surfacing, substrate and other products; include manufacturer's maintenance instructions and recommendations.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Verification Samples: Submit 4 inches square minimum size samples representing actual products and colors selected.

**1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Same fabricator as for Section 06 20 00 - Finish Carpentry and 12 34 00 - Plastic Laminate Casework.
- B. Installer Qualifications: Fabricator of casework on which tops are to be installed.

**1.06 WARRANTY**

- A. See Section 01 78 01 - Warranties, for additional warranty requirements.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

**1.08 FIELD CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**PART 2 PRODUCTS****2.01 COUNTERTOP ASSEMBLIES**

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
- B. Plastic Laminate Countertops: High pressure decorative laminate sheet (HPDL) bonded to substrate with backer sheet.
  - 1. Laminate Sheet: HGS, NEMA LD 3 Grade 0.048, nominal 1/16 inch thickness.
    - a. Fire Resistance, ASTM E84: Flame spread 25, max. Smoke developed 450, max.
    - b. Manufacturers and Colors: See Finish Legend.
  - 2. Exposed Edge Treatment: Extruded or molded plastic, PVC or ABS edge, 3 mm thickness, 1-5/16 inch wide or as required to completely cover edge of finished panel.
    - a. Color: As selected by Architect from the manufacturer's full line.
    - b. Products:
      - 1) ABS Greenline by Dollken Woodtape.
      - 2) Edge Banding by Charter Industries.
      - 3) Substitutions: See Section 01 60 00 - Product Requirements.
  - 3. Back and End Splashes: Same material, same construction.
  - 4. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
  - 5. Counter Substrate: See Accessories below.
- C. Laboratory Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components and highly resistant to chemical attack.
  - 1. Flat Surface Thickness: 1 inch, nominal.
  - 2. Flammability: Self-extinguishing, when tested in accordance with ASTM D635.
  - 3. NSF approved for food contact.
  - 4. Surface Finish: Smooth, non-glare.
  - 5. Color: Black.
  - 6. Exposed Edge Shape: 3/16 inch radius corner.
  - 7. Drip Edge: Drip groove 1/8 inch wide and deep, located 1/2 inch back from edge on underside of all exposed edges.
  - 8. Back and End Splashes: Same material, same thickness; separate for field attachment.
  - 9. Window sills for science rooms shall be fabricated out of material matching the laboratory countertops.
  - 10. Sinks: Same material, same color; lipped design to inset into counter top surface; bottom sloped to outlet; molded outlets; drain outlet located in back corner, accessible sinks shall outlet at rear corner. Complete with epoxy resin sink outlets, stoppers and tailpieces.
    - a. Sides and Ends: 1/2 inch minimum thickness.
    - b. Bottoms: 5/8 inch minimum thickness.
    - c. Interior Corners: 1 inch minimum radius.
    - d. Clamping collars for 1-1/2 or 2 inch diameter waste pipe, for sealed but not permanent connection.
  - 11. Product: Drop-In Sinks by Durcon Inc.
    - a. Substitutions: See Section 01 60 00 - Product Requirements.
  - 12. Sink sizes and fixture requirements:
    - a. Production Space 232, Science Lab 250 and Science Prep 251: Model D25; 18" L x 15" W x 7.9" D; one (1) combination hot and cold water fixture.

- b. Accessible: Model A05; 14" L x 10" W x 5" D; two (2) combination hot and cold water fixture.
  - c. Marine Tech 130: Model D51; 24" L x 16" W x 9.6" D; One combination hot and cold water fixture per sink.
- D. Solid Surface Countertops: Solid surface sheet or plastic resin casting over continuous substrate.
- 1. Flat Sheet Thickness: 1/2 inch.
  - 2. ISSFA-2 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. Fire Resistance, ASTM E84: Flame spread 25, max. Smoke developed 450, max.
    - b. Manufacturers and Colors: See Finish Legend.
  - 3. Exposed Edge Treatment: Built up to 1-1/2 inch thick; bullnosed edge.
  - 4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high and as indicated on the Drawings.
  - 5. Substrate: See Accessories.
  - 6. Sinks and Bowls: Separate units for under-counter mounting; minimum 3/4 inch thickness; comply with ANSI Z124.3.
    - a. Manufacturer: Corian.
    - b. Model 8252; Size: 15.25" L x 13 7/8" W x 5-1/4" D.
    - c. Locations: Countertops scheduled to be solid surface where a sink is indicated unless otherwise specified.

## 2.02 ACCESSORY MATERIALS

- A. Counter Substrate: Particle board; ANSI A208.1 Class M2; no urea formaldehyde-added.
- 1. Application: Counters with no sinks.
  - 2. Density; 38.7 pcf min.
  - 3. Modulus of Elasticity: 290,100 psi minimum.
  - 4. Panel Thickness for Plastic Laminate Facing: 1-1/8 inches.
  - 5. Panel Thickness for Solid Surfacing: 3/4 inches minimum.
- B. Counter Substrate: Medium density fiberboard; ANSI A208.2; Grade 130; no urea formaldehyde-added; water resistant.
- 1. Application: Counters with sinks.
  - 2. Density: 45 pcf min.
  - 3. Modulus of Elasticity: 405,000 psi minimum.
  - 4. Panel Thickness for Plastic Laminate Facing: 3/4 inches with built-up edges.
  - 5. Panel Thickness for Solid Surfacing: 3/4 inches minimum.
  - 6. Product: Medex by SierraPine.
- C. Adhesives: Silicone adhesive as recommended by manufacturer of materials being joined.
- D. Joint Sealant: Mildew-resistant silicone sealant, clear.

## 2.03 FABRICATION

- A. Fabricate in accordance with standards governing fabrication quality that are specified in herein. Field conditions shall be carefully measured prior to fabrication of countertops.
- B. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
- 1. Join lengths of tops using self-leveling metal splines to draw sections together.
  - 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.
- C. Provide back and end splashes wherever counter edge abuts vertical surface unless otherwise indicated. Fabricate splashes 4 inches high, unless otherwise indicated. Splashes shall be fabricated loose, unless indicated to be integral with the counter surface.



- D. Plastic Laminate Countertops:
  - 1. Fabricate up to 10 feet long without joints. Fabricate up to 5 feet wide without joints.
  - 2. All edges shall be tooled smooth and square.
  - 3. Provide backer surfacing on non-exposed substrate surfaces for balanced construction.
  - 4. Where materials meet at edges and corners, joints shall butt and overlapping members shall be filed off smooth, forming a slightly eased joint.
  - 5. All joints shall be shop-prepared. No joint shall be located within 12 inches of a sink or 3 inches of a corner.
- E. Solid Surfacing Countertops:
  - 1. Fabricate tops up to 144 inches long in one piece.
  - 2. Join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
  - 3. Provide separate square edge side splashes.
  - 4. Located seams at least 3 inches from corners.
- F. Resin Composite Countertops:
  - 1. Fabricate components to greatest extent practical to sizes and shapes indicated, and in accordance with manufacturer's recommendations. Form joints between components using manufacturer's standard joint adhesive and reinforce as required. Provide factory cutouts for plumbing fittings and accessories as required.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. 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.
- C. Acclimate countertop materials to temperature and relative humidity of the installation site for at least 24 hours.

#### **3.03 INSTALLATION**

- A. Securely attach countertops to cabinets using concealed fasteners and with contact surfaces set in waterproof glue. Verify that cabinet top surfaces are level. Shim where required.
- B. Counter cleats shall be installed at walls where indicated and where required for counter support. See Section 06 20 00 - Finish Carpentry. At countertops with no sinks, if counter cantilevers more than 3 inches beyond cabinet support, install 3/4" plywood over cabinet tops extending to full countertop cantilever. Use moisture resistant MDF at counters with sinks.
- C. Solid Surface Countertops:
  - 1. Secure countertops to cabinets with silicone sealant. Do not use water based adhesives.
  - 2. Provide a 1/32 inch expansion for 8 foot length of counter.
  - 3. Sealant joints shall be 1/8 inch minimum in width.
  - 4. Seam and finish joints as recommended by the manufacturer.
- D. Plastic Laminate Countertops:
  - 1. Attach countertops using screws with minimum penetration into substrate board of 5/8 inch.
  - 2. Finish butt seams with matching sealant, as recommended by manufacturer.
- E. Epoxy Resin Countertops: Attach using compatible adhesive.

- F. Loose countertop back and side splashes shall be set in a continuous bead of silicone sealant at the countertop and at the wall.
  - 1. Provide a neat continuous bead of silicone at the joint between top of splash and vertical wall surface.

**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 CLEANING**

- A. Clean countertop surfaces thoroughly.

**3.06 PROTECTION**

- A. Protect installed products until completion of project.
- B. Any scratched or defaced materials shall be completely replaced at no additional cost to the Owner.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

**SECTION 12 48 13**  
**ENTRANCE FLOOR MATS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Carpet mat.
- B. Substrate patching and leveling.

**1.02 RELATED SECTIONS**

- A. Section 01 40 00 - Quality Requirements: Concrete substrate moisture testing.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors. Concrete Moisture Vapor Reduction Admixtures.
- C. Section 09 05 61 – Common Work Results for Flooring Preparation.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating properties of mat products and cleaning instructions.
- C. Samples: Submit samples 4 x 4 inches minimum in size, illustrating pattern, color and finish.
- D. Certification and Field Reports: Prior to installation of flooring, submit written certification from the flooring manufacturer that condition of sub-floor is acceptable.
- E. Maintenance Materials:
  - 1. Extra Mat tile material: 5% of each type and color installed.
  - 2. Materials shall be in provided in unbroken packaging when job is complete. Notify the Architect in writing of the quantity and location of materials furnished. These materials may not be used by the Contractor for corrective work during the warranty period.

**1.04 FIELD CONDITIONS**

- A. See Section 01 00 00 - General Requirements, for minimum indoor air quality improvement requirements.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a relative humidity of between 40 - 67 % and temperature between 65 degrees F to 80 degrees F, to achieve temperature stability. After installed product has cured, thereafter maintain conditions above 55 degrees F.

**1.05 WARRANTY**

- A. See Section 01 78 01 - Warranties, for additional warranty requirements.
- B. Provide manufacturer's product warranty against manufacturing defects and faulty workmanship for three years from the date of Substantial Completion.

**PART 2 PRODUCTS****2.01 MATS**

- A. Carpet Tile MAT-1: Polyamide yarns and cut pile; primary and secondary vinyl or latex backing.
  - 1. Colors: See Finish Legend.
  - 2. Lay-Pattern: See Finish Legend. Adhesive as recommended by manufacturer.
  - 3. Product: Coral Duo by Forbo.
    - a. Substitutions: See 01 60 00 - Product Requirements.
- B. Carpet Tile MAT-2: Solution Dyed, Textured Patterned Loop with backing. Class I; Less than 450 flaming (ASTM E662).
  - 1. Tile Size: 24" x 24"
  - 2. Tufted Yarn Weight: 29 oz.

3. Total Thickness: 0.280 inches.
5. Backing: Nexus® Modular
6. Color: See Finish Legend.
7. Lay-Pattern: See Finish Legend. Adhesive as recommended by manufacturer.
8. Warranty: Lifetime commercial limited.
9. Product: Incognito Walk-off Modular 7069 manufactured by J&J Flooring Group
  - a. Substitutions: See 01 60 00 - Product Requirements.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION AND FIELD TESTING**

- A. Verify that surfaces are flat to tolerances acceptable to mat 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.
- B. Contractor's testing agency shall verify concrete subfloor or self-leveling underlayment surface moisture emission rates and alkalinity in accordance with ASTM F1869, prior to installation of any flooring. Test results shall be made available to the contractor for determination of acceptability by the flooring and adhesives manufacturers. Contractor shall obtain instructions from flooring manufacturer if test results are not within their recommendation limits.
  1. Scientific Testing of Concrete Moisture Vapor Reduction Admixtures specified in Section 03 30 00.
  2. See Section 09 05 61 – Common Work Results for Flooring Preparation for additional requirements.
- C. Any conditions that could adversely affect the flooring installation shall be corrected, prior to proceeding with the Work. Commencement of the installation of flooring shall be considered acceptance of the concrete slab as being suitable for the intended application. Any conditions that could adversely affect the flooring installation shall be brought to the Contractor's attention, for resolution, prior to proceeding with the Work.

#### **3.02 PREPARATION**

- A. Prepare subfloor surfaces as recommended by flooring manufacturer.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor patching compound to achieve smooth, flat, hard surface.
- C. Subfloor surfaces shall not vary more than plus or minus 1/8" in any 10' dimension. Neither shall they vary at a rate greater than 1/16" per running foot. Leveling compound shall be used for larger areas.
- D. Vacuum clean floor recess.

#### **3.03 INSTALLATION**

- A. Coordinate the installation of mats with thresholds and transition strips furnished and installed by other trades.
- B. Mats shall completely cover (wall-to-wall) areas so scheduled.
- C. Mat manufacturer's release-bond adhesive shall be applied with a notched towel as recommended by the manufacturer.
- D. Installation area shall remain free of all traffic for a minimum of 24 hours and from wheeled traffic for a minimum of 72 hours, or as otherwise recommended by the flooring manufacturer.

#### **3.04 TOLERANCES**

- A. Maximum Gap Formed at Recessed Frame From Mat Size: 1/4 inch.

#### **3.05 PROTECTION**

- A. Provide protection for all mats until substantial completion.

**END OF SECTION**

**SECTION 14 20 10  
PASSENGER ELEVATOR****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Complete elevator system.
- B. Elevator maintenance.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: pit.
- B. Section 05 12 00 - Structural Steel Framing: Hoistway framing.
- C. Section 05 50 00 - Metal Fabrications: Sill supports.
- D. Section 07 81 23 – Intumescent Mastic Fireproofing: Fireproofing of guide rail brackets where attached to building structural members.
- F. Section 09 21 16 - Gypsum Board Assemblies: Gypsum shaft walls.
- G. Division 21 - Fire Suppression: Sprinkler heads in hoistway.
- H. Division 22 - Plumbing: Pit drain.
- I. Division 23 - HVAC: Ventilation and temperature control.
- J. Division 26 - Electrical: Equipment power and wiring; pit lighting.
- K. Division 28 - Electronic Safety and Security: Fire Alarm System

**1.03 REFERENCE STANDARDS**

- A. ASME A17.1 - Safety Code for Elevators and Escalators; The American Society of Mechanical Engineers; 2010.
- B. AWS D1.1 - Structural Welding Code - Steel; American Welding Society; 2010.
- C. NFPA 70 - National Electrical Code.
- D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- E. UL - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- F. ADA - Accessibility Guidelines ADAAG, 2010.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Convene a meeting at least 3 weeks prior to starting work.
  - 1. Review schedule of installation, installation procedures and conditions, and coordination with related work.
- B. Construction Use of Elevator: Not permitted.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate the following information:
  - 1. Locations of controllers, operating equipment.
  - 2. Hoistway components: Car, guide rails, buffers, jacks and other components.
  - 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
  - 4. Individual weight of principal components; load reaction at points of support.
  - 5. Loads on hoisting beams.
  - 6. Clearances and travel of car; clear hoistway and pit dimensions.
  - 7. Location and sizes of access doors, doors, and frames.
  - 8. Applicable seismic design data.

9. Electrical characteristics and connection requirements.
- C. Product Data: Provide data on the following items:
  1. Signal and operating fixtures, operating panels, indicators.
  2. Cab design, dimensions, layout, and components.
  3. Cab and hoistway door and frame details.
  4. Electrical characteristics and connection requirements.
  5. Expected heat dissipation of elevator equipment.
  6. Color selection charts for cab and entrances.
- D. Maintenance Data: Include:
  1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
  2. Technical information for servicing operating equipment.
  3. Legible schematic of hydraulic piping and wiring diagrams of installed electrical equipment and changes made in the Work. List symbols corresponding to identity or markings on hoistway apparatus.
  4. Provide all maintenance data in electronic and hard copy formats.
- F. Keys: Turn over to the Owner 10 keys for elevator operation.

#### **1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with applicable code and as supplemented in this Section.
- B. Designer Qualifications: Design guide rails, brackets, anchors, and machine anchors under direct supervision of a Professional Structural Engineer experienced in design of work of this type and licensed in Maine.
- C. Perform welding of steel in accordance with AWS D1.1.
- D. Fabricate and install door and frame assemblies in accordance with NFPA 80.
- E. Perform electrical work in accordance with NFPA 70.
- F. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum fifteen years documented experience.
- G. Installer Qualifications: Company specializing in performing the work of this Section and approved by elevator equipment manufacturer.
- H. Products Requiring Fire Resistance Rating: Listed and classified by UL.
- I. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

#### **1.07 WARRANTY**

- A. See Section 01 78 10 - Warranties, for additional warranty requirements.
- B. Provide two (2) year manufacturer's warranty for elevator operating equipment and devices starting at date of Substantial Completion of the Project.
- C. Provide emergency 24 hour call back service with services performed during working hours for one-year after substantial completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design: Canton Elevator; Product: Dual Single Stage #3500 Series, Holeless Hydraulic Passenger Elevator.
- B. Acceptable Manufacturers:
  1. ThyssenKrupp Elevator
  2. Otis Elevator
  3. Substitutions: See Section 01 60 00 - Product Requirements.

- C. All components to be manufactured by same entity, unless otherwise indicated.

## 2.02 ELEVATORS

- A. Elevator: Passenger, holeless hydraulic with machine-room.
1. Equipment Control: Microprocessor.
  2. Operation: GAL MODL.
  3. Car Enclosure: Manufacturer's standard pre-engineered car enclosure including ventilation, lighting, ceiling finish, wall finish, access doors, entrance door, trim, accessories.
    - a. Car Wall Finish: Manufacturer's standard high pressure plastic laminate vertical panels complying NEMA LD3, 0.05 inch thickness, color and texture as selected by the Architect from the manufacturer's full range.
    - b. Car Ceiling: LED perimeter lit ceiling, white. Emergency car lighting shall be provided.
    - c. Car Flooring: Shall be provided as a part of the Work of Section 09 65 00. - Resilient Flooring.
    - d. Front Panel and Car Door: AISI Type 302/304 stainless steel with No. 4 satin finish. Car door frame shall be fabricated integrally with the front wall of the car.
    - e. Car Handrails: Flat tubular satin stainless steel handrails on back and both side walls.
    - f. Protective Pads: One set for elevator cab, of full height, heavy cotton duck, padded and quilted, removable with brass grommets and permanent car hooks.
    - g. Car Fan: One-speed 120 VAC fan mounted to the structural ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration will baffle to diffuse audible noise. Provide a switch in the car-operating panel to control the fan
    - h. Top of car inspection and exit door with emergency exit electrical contact.
    - i. Stainless steel certificate frame.
  4. Hoistway Doors and Frames: Stainless steel.
  5. Hoistway and Cab Entrance Frame Opening Size: 3'-6" x 7'-0".
  6. Door Type: Single leaf.
  7. Door Operation: Side opening.
  8. Rated Net Capacity: 3,500 lbs.
  9. Rated Speed: 100 ft/min.
  10. Capacity: 3,500 lbs. Platform Size: 7'-0" W x 6'-2" D inches.
  11. Cab Height: 8'-0".
  12. Travel Distance: As indicated on the Drawings.
  13. Number of Stops: 2.
  14. Number of Openings: 2 Front.
  15. Provide equipment according to seismic zone. See Structural Drawings.
  16. Sleep mode operation for LED ceiling lights and car fan.

## 2.03 CONTROLS

- A. Elevator Controls: Provide landing buttons and hall lanterns. Flat flush mounted satin stainless steel buttons, with raised numerals and Braille markings and LED illuminating halo.
- B. Car Operating Panel:
1. Raised markings and Braille to the left hand side of each push-button.
  2. Car Position Indicator at the top of and integral to the car operating panel.
  3. Door open and door close buttons.
  4. Inspection key-switch. Elevator operation by key switch.
  5. Elevator Data Plate marked with elevator capacity and car number.
  6. Help Button: ADA compliant help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.



7. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
  8. In car stop switch (toggle or key unless local code prohibits use).
  9. Firefighter's hat.
  10. Firefighter's Phase II Key-switch and Firefighter's Phase II Emergency In-Car Operating Instructions: worded in accordance with A17.1.
  11. Call Cancel Button.
- C. Door Controls:
1. Program door control to open doors automatically when car arrives at floor.
  2. Render "Door Close" button inoperative when car is standing at dispatching terminal with doors open.
  3. If doors are prevented from closing for approximately ten seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
  4. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equip with object proximity infrared detector device.
- D. Landing Buttons: Stainless steel type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows. Key operation option. Provide 10 keys for Owner's use.
- E. Landing and Car Fixtures: Illuminating white (LED).
- F. Interconnect elevator control system with building fire alarm systems.
- G. Signage: Comply with all applicable codes and ADA Architectural Guidelines. Provide raised markings, for all controls, hall buttons and signals. Hall button signage shall include directional graphics. Provide door jamb markings, numbers and braille. Provide capacity sign engraved into front inside of each car. Provide "In case of fire..." engraved signage adjacent to hall buttons including pictorial of person descending stairs during a fire. All signage shall be on contrasting background.

## **2.04 HOISTWAY COMPONENTS**

- A. Plunger and Cylinder: Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
- B. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
- C. Polyurethane type buffers shall be used
- D. Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.
- E. Pit ladder, primed steel, in conformance to OSHA standards and ASME A17 requirements.
- F. Hoistway Entrances:
1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
  2. Sills shall be extruded aluminum finish.
  3. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
  4. Fire Rating: Entrance and doors shall be UL fire rated for 1 hour.

5. Entrance Marking Plates: Entrance jambs shall be marked with 4" x 4" plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.

G. Sight Guards: Locate at all doors.

## **2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS**

- A. Electrical Characteristics:
  1. Main Power Supply: 480 volts, three phase, 60 Hz. Car
  2. Lighting Power Supply: 120v, single phase, 60 Hz., 15 Amps.
- B. Emergency Power Supply: Self-contained battery power, for lowering.

## **2.06 MACHINE COMPONENTS**

- A. The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and a shut-off valve. The entire hydraulic system with hydraulic-fluid storage tank, power component and valves shall be located in the hoistway pit and be easily accessible for maintenance through an access door in the hoistway wall.
- B. A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, and other components or functions described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.
  1. The controller shall be located together with the hydraulic system in the elevator machine room and be easily accessible for maintenance and per applicable code.
- C. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- D. Wall-Mounted Frames: Glazed with clear plastic; sized as required. Provide one for master electric and hydraulic schematic and one for lubrication chart. Install charts.
  1. Provide frame for original copy of the elevator licensing certificate.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that hoistway and pit are ready for work of this Section.
- C. Verify hoistway shaft and openings are of correct size and within tolerance.
- D. Verify location and size of machine foundation and position of machine foundation bolts.
- E. Verify that electrical power and tel/data utilities are available and of the correct characteristics.

### **3.02 PREPARATION**

- A. Arrange for temporary electrical power for installation work and testing of elevator components.

### **3.03 INSTALLATION**

- A. Install system components. Connect equipment to building utilities.
- B. Provide conduit, boxes, wiring, and accessories.
- C. Mount machines on vibration and acoustic isolators, on bed plate and concrete pad. Place on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.

- D. Accommodate equipment in space indicated.
- E. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.
- F. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
- G. Bolt or weld brackets directly to structural steel hoistway framing.
- H. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.
- I. Coordinate installation of hoistway wall construction.
- J. Install hoistway door sills, frames, and headers in hoistway walls. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
- K. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- L. Adjust equipment for smooth and quiet operation.

### **3.04 ERECTION TOLERANCES**

- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1.

### **3.05 FIELD QUALITY CONTROL**

- A. Testing and inspection by regulatory agencies will be performed at their discretion.
  - 1. Schedule tests with agencies and notify Owner and Architect.
  - 2. Obtain permits required to perform tests.
  - 3. Document regulatory agency tests and inspections in accordance with the requirements of Section 01 40 00.
  - 4. Perform tests required by regulatory agencies.
  - 5. Furnish test and approval certificates issued by Authorities Having Jurisdiction.
- B. Instruction and Demonstration: Instruct Owner's personnel in proper use and operation of the elevators. Review emergency provisions, including emergency access and procedures for an operating failure or other building emergency. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Review the 12-month maintenance program provided as part of the scope of this Work.

### **3.06 ADJUSTING**

- A. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- B. Adjust automatic floor leveling feature at each floor to achieve 1/4 inch from flush.

### **3.07 CLEANING**

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components ready for inspection.

### **3.08 PROTECTION**

- A. Do not permit construction traffic within cab after cleaning.
- B. Protect installed products until project completion.
- C. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

### **3.09 MAINTENANCE**

- A. See Section 01 78 00 - Project Close-out, for additional requirements.
- B. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the elevator manufacturer or original installer. Notify Owner prior to all maintenance and provide follow-up documentation to the Owner after each visit.
- C. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of Owner.

- D. Provide service and maintenance of elevator system and components two-years from Date of Substantial Completion of the Project.
- E. Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:
  - 1. Remotely diagnose elevator issues with a remote team of experts.
  - 2. Remotely return an elevator to service.
  - 3. Provide real-time status updates via email.
  - 4. Remotely make changes to selected elevator functions including:
    - a. Conserve energy: Activate cab light energy save mode, activate fan energy save mode.
    - b. Improve passenger experience: Extend door open times, change parking floor, activate auto car full, activate anti-nuisance, advance door opening, door nudging, extend specific floor extended opening time, release trapped passengers
- F. Examine system components monthly. Clean, adjust, and lubricate equipment. Provide maintenance visits as recommended per applicable manufacturer warranty requirements but in no case, less than each 12-month period of service.
  - 1. Prior to the end of the 24-month manufacturer warranty provide a maintenance visit. In addition to general maintenance activities submit to the Owner an existing conditions report of the elevator and associated systems with recommended maintenance intervals thereafter the warranty period.
- G. Maintenance shall be in accordance with recommendations and requirements of ASME A17.1.
- H. Include systematic examination, adjustment, and lubrication of elevator equipment. Maintain hydraulic fluid levels. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment.
- I. Perform work without removing cars during peak traffic periods.
- J. Provide emergency call back service during working hours for this maintenance period.
- K. Maintain an adequate stock of parts for replacement or emergency purposes locally, near the place of the Work. Have personnel available to ensure the fulfillment of this maintenance service, without unreasonable loss of time.

**END OF SECTION**